

PRODUCT CATALOGUE



مصدر masdar
للتجهيزات الفنية Technical Supplies

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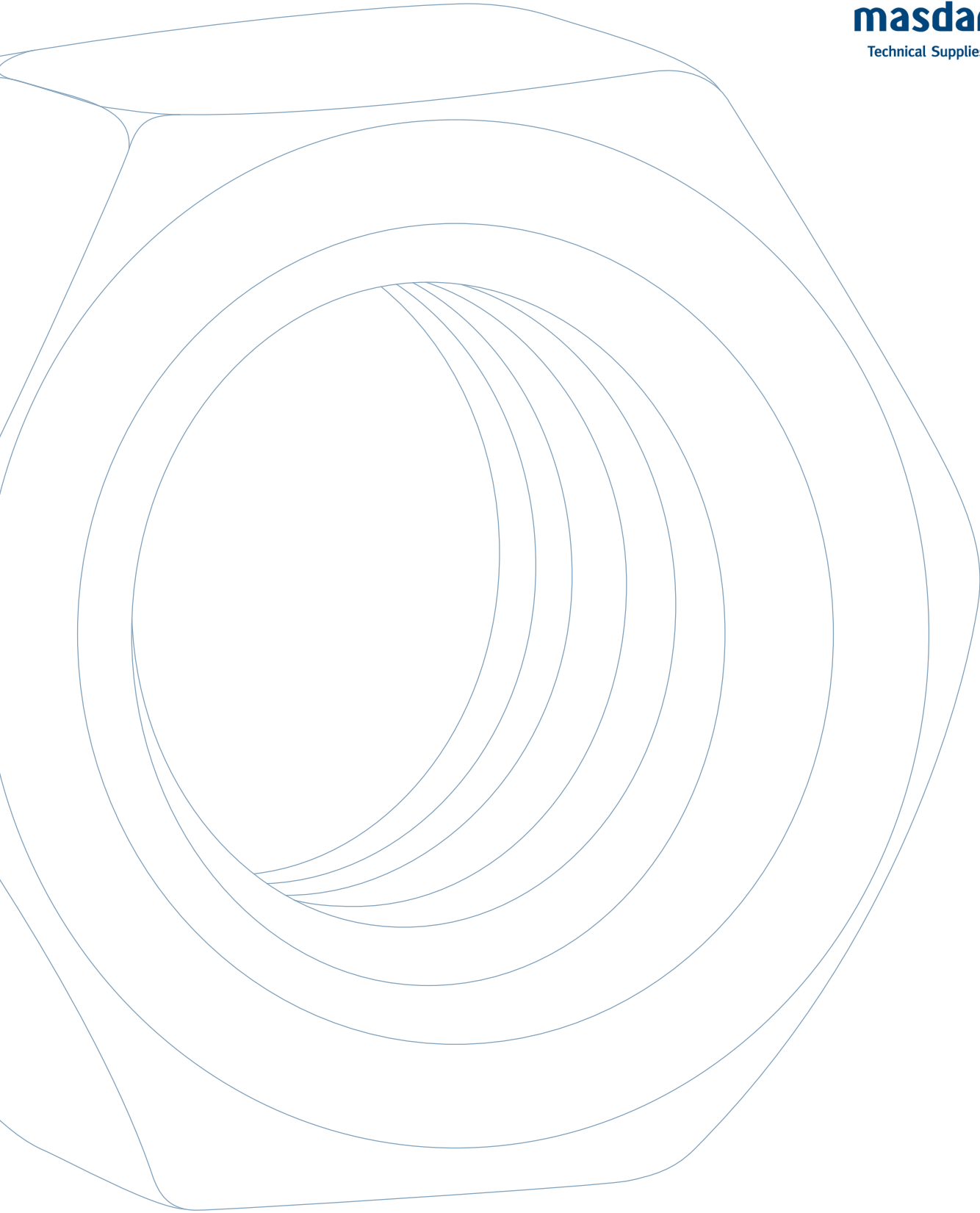
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masdar مصدر

Technical Supplies للتجهيزات الفنية



CAPABILITY OVERVIEW

Founded in 1940's, Al-Muhaidib Group is among the largest business groups in Saudi Arabia

The Group has achieved its prominent position through diversification driven by its commitment to quality, efficient organizational culture and adherence to strong business ethics.

FACT SHEET

Company founded in : 1943

Employees : 8000+

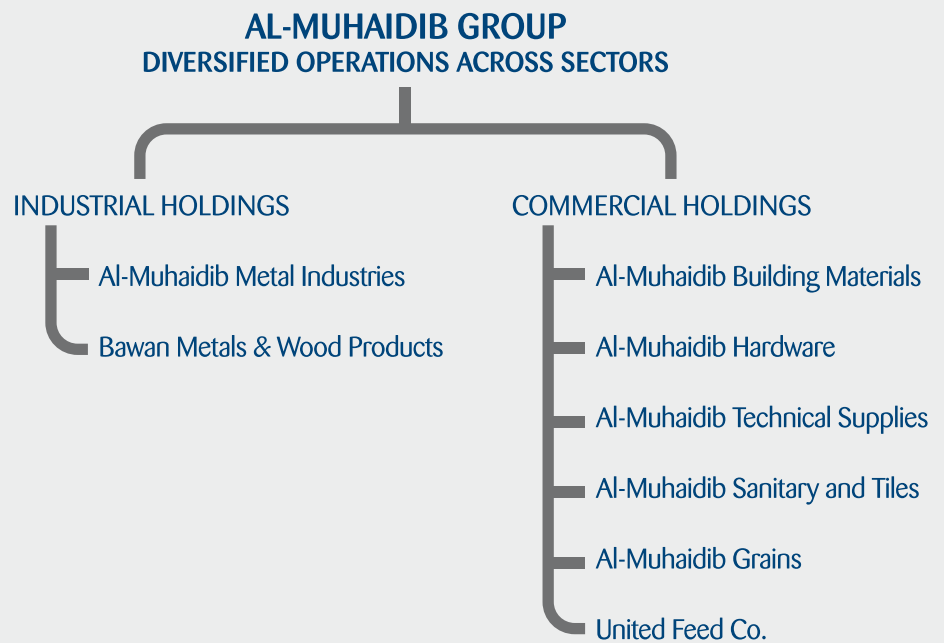
Revenues (2008) : \$ 3bn+

Key Personnel

Sulaiman A. K. Al-Muhaidib (Chairman)

Emad A. K. Al-Muhaidib (Vice Chairman)

Essam A. K. Al-Muhaidib (CEO)





Al-Muhaidib Group: Key Success Factors

Strong entrepreneurial values and spirit

The strong entrepreneurial spirit of the Group's founder, Mr. Sulaiman A.K. Al-Muhaidib and the family helped grow the business to a US\$ 3Bn diversified group across the GCC. This entrepreneurial spirit, demonstrated by quickness in filling gaps in the market, has attracted entrepreneurs from different parts of the globe, into partnerships and joint ventures with the family.

Strong family culture

The Group has a strong family culture, whereby employees feel that they are part of the larger Al-Muhaidib Family. The close relationship between owners and employees has resulted in strong vertical communication between the three brothers and staff.

Commitment to the business through high reinvestment

The Family's strategy is not to take dividends, but rather to reinvest all of their collective earnings through the Al-Muhaidib Group. Moreover, the Family has demonstrated willingness to invest in new business lines to strategically expand the Group into diversified businesses and geographies.

Patient Capital

By having a long-term investment horizon, the Group has been able to successfully enter new areas of business. This "Patient Capital" strategy has also enabled the Group to become a "Partner of Choice" for other local and international investors active in the Saudi market and other GCC countries.

Truly egalitarian and complementary leadership responsibilities split among the brothers

The "Three Brothers, One Heart" approach to partnership, has enabled the family to share responsibilities across the three main cities in Saudi Arabia, across the major categories of traditional business lines, and to expand the business to new horizons.

MTS...Serving the customers in the Kingdom for more than 35 years

VISION - "TO LEAD THE GCC FASTENERS MARKET"

Deliver outstanding service by enabling our resources to provide a wide range of quality and tailor-made products and serve as Technical Advisor to our customers all over the GCC.

Continue our aggressive growth and foot prints in KSA and GCC by leveraging the regions' economic growth, our existing resources and acquiring businesses with the aim of satisfying shareholder returns.

Differentiating values

- Customer satisfaction
- Performance excellence

Foundation values

- Open
- Honest
- Respect
- Teamwork



MTS ... Your partner for fastener requirements



- Established over 35 years ago
- Approved fastener supplier for ARAMCO, SABIC and other major Project Owners and Contractors
- 14 professional showrooms in KSA, two more in UAE and growing!
- One main warehouse in Riyadh having a floor area of more than 30,000 sq.m. and Three more warehouses in Jeddah, Dammam and Dubai.
- MTS represents certified manufacturers which produce high quality fasteners with relevant documentation available.
- We maintain the largest inventory of fastener products in the MENA region
 - Full range of SKUs across all fastener product categories
 - Wide variety of Iron, Steel, Stainless Steel, Copper, Aluminum & Plastic fasteners, with Zinc Plated, Hot Dip Galvanized, and Black Passivated finishings
 - Special requirements can be arranged at short notice

MTS ... offers a product range of over 20,000 varieties of Bolts, Nuts, Washers & Screws

Hexagonal Head Bolts

Stud Bolts and Anchor Bolts

Nuts Range

Screws Range

Plastic Anchor Accessories

Washer

Pin & Key

Rivet

Clamp & Duct Fixing

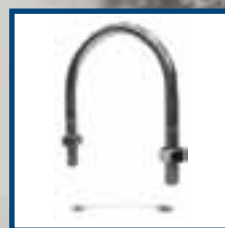
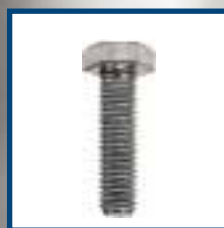
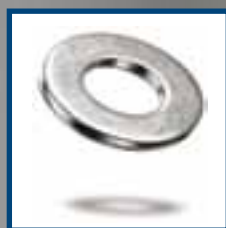
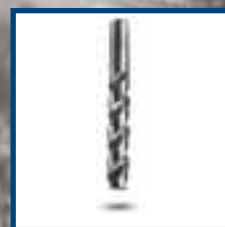
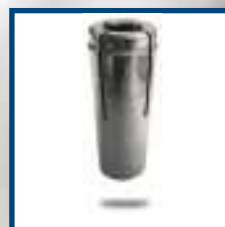
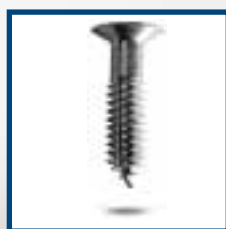
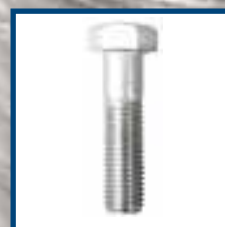
U-Bolts, L-Bolts

Threaded Rods Range

Drill Bit

Automotive Fasteners

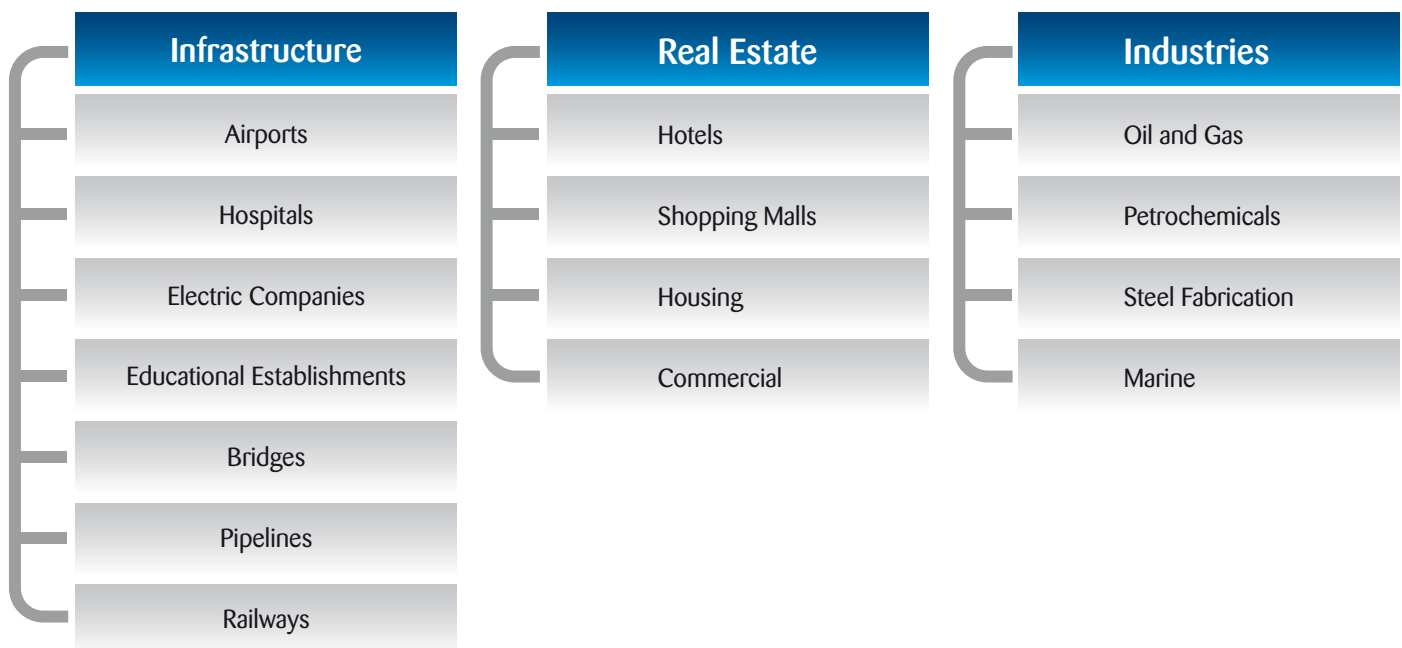
Other Fasteners



MTS ... uniquely positioned to serve all customer needs
through an expanding network of locations



MTS ... serving fastener requirements across Industries/Sectors
with trusted technical assistance and after sales service



MTS ... Fabrication Capabilities

- Specializes in fabrication of high quality Anchor Bolts, U-Bolts Bend bolts and clamps, per customer requirements.
- MTS also provides Hot Dip Galvanizing in accordance with ASTM A123 or ASTM A153 Class C.
- The company also provides Yellow Chromating and Blue Chromating in accordance with ASTM B633 or DIN267 Part 9.
- MTS offers a wide range of new products through its in-house innovation and R&D center.
- MTS is approved by major companies like ARAMCO, SCECO, SABIC, Royal Commission and MARAFIQ.





MTS ... Warehousing Facility

Our warehouses are located in major KSA cities and promptly respond to demands of the local and regional market.

The main warehouse area is over thirty thousand sq.m. and can accommodate more than twenty thousand items including different types of fixing material (Bolts, Nuts, Washers, and Fasteners with complete accessories etc.) made of iron, steel, stainless copper, aluminum, plastic with variety of galvanization; yellow, chrome, black, etc.







MTS ... Support for the brand

Participating in local and international exhibitions; Big 5 Dubai 2009/2010, Saudi Oil & Gas 2010, Near East Exhibition in Jordan 2010 and Big 5 Saudi Arabia 2011.



Participants at the International
Exhibition Big 5 Dubai 2010



Other Events:-



**IRAQ MEGA
PROJECTS**

26 - 28 October 2010, Hilton Convention Centre, Istanbul, Turkey





MTS ... The Employer of Choice

Constantly training employees to upgrade their skills through partnerships with international agencies like Genyx & Alliance.



MTS ...Quality Assurance

MASDAR focuses on Best Practices in Quality checks and lowering DPM (Defects per million)



MTS ...Safety First

Constantly monitoring and implementing
safety standard for its employees

MASDAR ... committed to customer service through flexible supply arrangements

BLANKET CONTRACT

- Annual agreement based on demand forecasts
- Fixed Prices
- Reserved Inventory
- Delivery Guarantee
- Technical Consultation Supporting Documents

VENDOR MANAGED INVENTORY

- Bin System – MTS maintains stock at customer location
- Annual Agreement - fixed prices - monthly billing
- Forecast to establish min. / max. inventory levels
- Quarterly SKU's Review
- Technical Consultation Supporting Documents

CONSIGNMENT SYSTEM FOR MTS PRODUCTS ON-SITE

- Annual Agreement - fixed prices
- Single delivery with replenishment if needed
- Billing based on reported usage
- Quarterly SKU's Review
- Technical Consultation Supporting Documents



COMPETITIVE ADVANTAGE OF MTS

People

Quick response

Service

Range

Quality

Competitive price

Location

Commitment

**MTS... Customer
Satisfaction, the secret behind
our Prosperity & Success**

MASDAR.. our endless clients list speaks volumes about our capabilities





Our ISO Certification



MTS ... SAUDI ARAMCO & SABIC approved vendor

Saudi Arabia 5121000000
 Fax: 011 4460388
 P.O. Box 7453
 Riyadh 11462
 October 27, 2004

ALMUKHADIB TECHNICAL SUPPLIES
 P.O. Box 7453
 Riyadh 11462

Attn: Mr. Shouq J. Al-Sawad

Fax: (011) 4460388

Dear Sir,

We are pleased to inform you that your company is now considered a potential supplier to Saudi Aramco under Vendor Code 10021010. As per your CR, the following materials service groups are approved for you:

MSG	MSG DESCRIPTION
042000	Cables, Power
050000	Lighting Fixtures and Accessories, for industrial use
058000	Switchgear (C.V.)
062000	Power Distribution, MCC & Panelboard
063000	Control Devices, Relays, Timers, Sensors, etc.
064000	Electrical Fittings & Connectors
114000	Bolts, Nuts, Rivets, Studs (except welding) and washers
115000	Nuts, Screws and the Fasteners
120000	General Building Materials
121000	Sheets and Plates, Steel
124000	Metals, Other

This approval, however, should not be construed as a commitment by Saudi Aramco to purchase from you, but your company will have the opportunity along with other approved sources to respond to requests for submitting proposals in accordance with Saudi Aramco's established policies and procedures. All purchase agreements and orders will be issued based on the name and address stated in your commercial registration (CR), as stated above.

Please note that evidence of representation from your supply sources must be supported by letter(s) of confirmation stipulating the territorial coverage and specific product lines involved. Your supply sources must have been accepted as qualified suppliers of the range of materials that you wish to supply. It is also important that you advise us immediately of any changes in the agreements which you have negotiated with your supply sources and/or any changes in your contact information such as postal address, telephone and fax numbers.

Should you have any questions, please call Mr. Rajat M. Al-Sharrah on 874-0318.

Ahmed Hassan Al-Harbi
 Ahmed Hassan Al-Harbi, Supervisor
 Supplier Development & Registration Unit

SABIC

سابك

FAX MESSAGE

To: ALMUKHADIB TECHNICAL SUPPLIES	Date: 18 May 2006
Attn: AHMED ABDELLAH AL-MOHSEN	Tel No: 038278018
Subject: QUALIFICATION	Fax No: 038278040
	Total # Pages: 1

Dear Ahmed,

Based on business needs, we are pleased to report that you have been qualified under Vendor # 004270.

Qualification means that you are eligible to receive requests for quotations and orders for the designated materials and/or services. However, there is no guarantee that you will receive any such requests or orders.

Thank you for your interest in being a supplier to SABIC.

Best regards,

Sultan A. Al-Sarrit
SULTAN A. AL-SARIT
 Supplier Qualification Analyst
 Supplier Qualification Section - Projects & Turnaround
 Supply Management Organization
 Saudi Basic Industries Corporation
 Tel #: +966 5 340 1806
 Fax #: +966 5 340 1950
 E-mail: sarrit@sabic.com

Note: For Supplier Information, please contact the following:
 Supplier Qualification Section - Projects & Turnaround Unit
 Saudi Basic Industries Corporation (SABIC)
 Street Services - Supply Management Organization (SSO)
 P.O. Box 11710, Jeddah - Mawana (Jeddah)
 Kingdom of Saudi Arabia
 Tel: 00966 (0) 5340 1806 - 1807 - 1808 - 1809 - 1810
 Fax: 00966 (0) 5340 1950
 E-mail: supinfo@sabic.com

ملاحظة: للحصول على معلومات الموردين، يرجى الاتصال بالشخص التالي:
 قسم التأهيل للموردين - مشاريع وصيانة
 شركة البتروكيماويات الأساسية (سابك)
 خدمات الشوارع - منظمة إدارة الإمداد (إس إس أو)
 صندوق ب. 11710، جدة - موانا (جدة)
 المملكة العربية السعودية
 هاتف: 00966 (0) 5340 1806 - 1807 - 1808 - 1809 - 1810
 فاكس: 00966 (0) 5340 1950
 بريد إلكتروني: supinfo@sabic.com



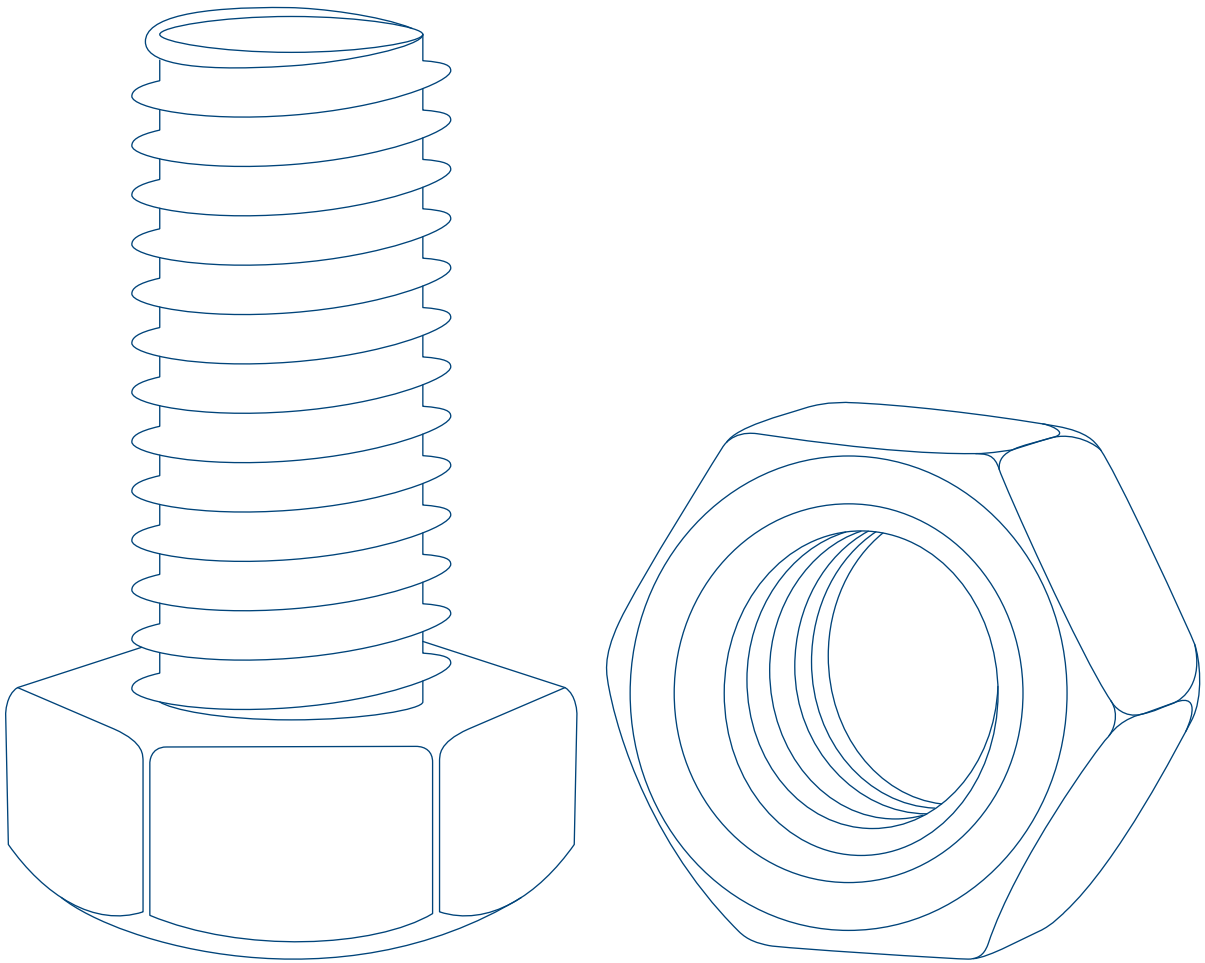
MTS ... Supplier of fasteners for more than 60 major projects since 2000

NO	PROJECT NAME	YEAR	NO	PROJECT NAME	YEAR
1	PRINCES NOURA UNIVERSITY	2011	14	SAMREF	2004/05
2	RAS TANURA DHT PROJECT	2009	15	SABIC IBN RUSHD – YANBU	2004
3	GAS PLANT EXPANSION PROJECT - TRG LAY DOWN AREA	2009	16	QATIF DOWNSTREAM PIPELINES	2003
4	STUD BOLTS FOR SUB SEA PIPELINES	2008/09	17	ASU (AIR SEPARATION PLANT) GAS V	2003
5	SAUDI ARAMCO PROJECT	2008	18	FABRICATION & INSTALLATION OF OFFSHORE PLATFORMS PIPELINE AND CABLES	2003
6	SEAWATER PIPELINES	2008	19	SAUDI ARAMCO SHELL REFINERY	2002/03
7	WASTE WATER UPGRADE PROJECT	2008	20	OLAYAN DESCON INDUSTRIAL CO	2002/03
8	CRUDE INCREMENT FACILITIES PROJECT	2007/08	21	ETHANE RECOVERY PLANT	2001/02
9	WATER DISPOSAL SYSTEM UPGRADE	2007/08	22	SASREF	2001/02
10	GAS PLANT EXPANSION	2007/08	23	SAFAMI	2000
11	GAS PLANT PROJECT	2007/06	24	DAYLIGHTING OF SHEDGUM GAS PLANT	2005
12	SAUDI CHEVRON PHILIPS CO	2005	25	MADHINA BULK PLANT PROJECT	2005
13	WASTE WATER TREATMENT	2005			

You can reach our local technical advisor at the following locations

LOCATION	PHONE	FAX	MOBILE
Head Office - Riyadh	966 1 4489999	966 1 4460385	
International Branches - Dubai	971 4 3235367	971 4 3235368	971 556089224
Abu Dhabi	971 2 5535373	971 2 5535374	
Tool Number - KSA	92 000 2838		
Central Region Sales Office - RIYADH	966 1 2418624	966 1 2700928	966 558844092
Eastern Region Sales Office - Dammam	966 3 8188444	966 3 8190980	966 504784963
Western Region Sales Office - JEDDAH	966 2 6491666	966 2 6496099	966 556223033
RIYADH Showroom (Old Sinaiyah)	966 1 4489999	966 1 4460385	966 500905246
RIYADH Showroom (Owaidah)	966 1 4470240	966 1 2044530	966 565027220
RIYADH Showroom (Rail Street)	966 1 4041579	966 1 4042045	966 553171726
Jeddah Showroom (Mekkah Road)	966 2 6020222	966 2 6870360	966 508005759
Jeddah Showroom (Alnuzha)	966 2 6121000	966 2 6545599	
Jeddah Showroom (Albalad)	966 2 6491666	966 2 6496099	
Qassim Showroom	966 6 3278899	966 6 3278800	966 500822744
Dammam Showroom (King Saud St.)	966 3 8375010	966 3 8375060	966 505268750
Dammam Showroom (Aladamah)	966 3 8338750	966 3 8338750	966 508897873
Dammam Showroom (City Center)	966 3 8328888	966 3 8311888	
Jubail Showroom	966 3 3635377	966 3 3610421	966 542615589
Madinah Showroom	966 4 8647777	966 4 8489565	966 506532802
Abha Showroom	966 7 2207072	966 7 2234911	966 507684690
Yanbu Showroom	966 4 3903311	966 4 3903389	966 562423917

Customer Care Department - Tel: +966 1 4489999 ext: 279 Mobile: +966 500688682 E-mail: customercare@mts.com.sa



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FASTENER TERMINOLOGY

Term	Definition
Acorn Nut	Also referred to as a cap nut. This type of nut has a domed top that covers the end of the bolt.
Angle of Head	Used in reference to countersunk fasteners. This is the angle from one side of the cone to the other. Standard measurement is 82 degrees. Special 100 degree heads are also made.
Backing Off	Loosening of a nut over time by spinning back up the thread.
Bearing Surface	The area of a fastener that carries a load. Washers are commonly used to increase the bearing surface.
Body	The smooth part of the bolt above the threads. Also called the shank.
Body Diameter	The diameter of the body or smooth part of the bolt above the threads. Also shank diameter or major diameter.
Bottom Tap	A special tap for finishing the threads to the very bottom of a hole that does not pass through the material. A regular tap must be used first.
Cap Nut	Also referred to as an acorn nut. This type of nut has a domed top that covers the end of the bolt.
Cap Screw	A term used to describe a machine bolt or machine screw. Usually preceded by a head style as in 'Hex cap screw'.
Carriage Bolt	A bolt with a smooth rounded head and a small square section under the head to prevent spinning during assembly. Used in wood.
Castle Nut	A hex nut with a slightly reduced slotted cylindrical section on one end. Used with a cotter pin and drilled fastener to prevent loosening.
Class	Used in metric, class is a material designation equivalent to the US term Grade (ex. Class 10.9). Also in US fasteners, a specification describing how tightly the fastener fits.
Clevis Pin	A pin with a head on one end and one or more drilled holes for a cotter pin.
Cone Point	A fastener with a full cone shaped point on the end. Often used in automated assembly to guide the fastener into the hole.
Cotter Pin	A folded pin with a loop at one end designed to have the other end bent to hold it in place.
Countersunk	A fastener head that sits at or below the surface of the material such as a flat or oval head.
Cup Point	A cone shaped end with a circular depression in the center. The contact area is thus a circular ridge. This is the most common point for set screws.
Cut Thread	Threads formed by cutting into a piece of stock. See also Roll Thread.
Die	A tool for cutting external threads into a rod.
DIN	An abbreviation for Deutsches Institut für Normung, the German standards body. In reference to fasteners DIN indicates fasteners that conform to a specific metric standard (will be followed by the standard number).
Dog / Dog Point	An unthreaded cylindrical tip that is smaller than the fastener diameter. Used to help speed alignment during assembly. Also called a Pilot Point
Dowel Screw	A double ended screw with wood threads and points on both ends.
Drilled Head	A fastener head with a hole drilled through it for a safety wire.
Drilled Shank	A fastener shank with a hole drilled through it for a pin or safety wire.
Elevator Bolt	A bolt with a large flat disk on the top and a square section underneath, resulting in a flush finish.
Engagement	A measurement of how much of the fastener is in the material being fastened. See Length of Engagement and Thread Engagement
External thread	Thread on the outside of a cylindrical piece of stock.

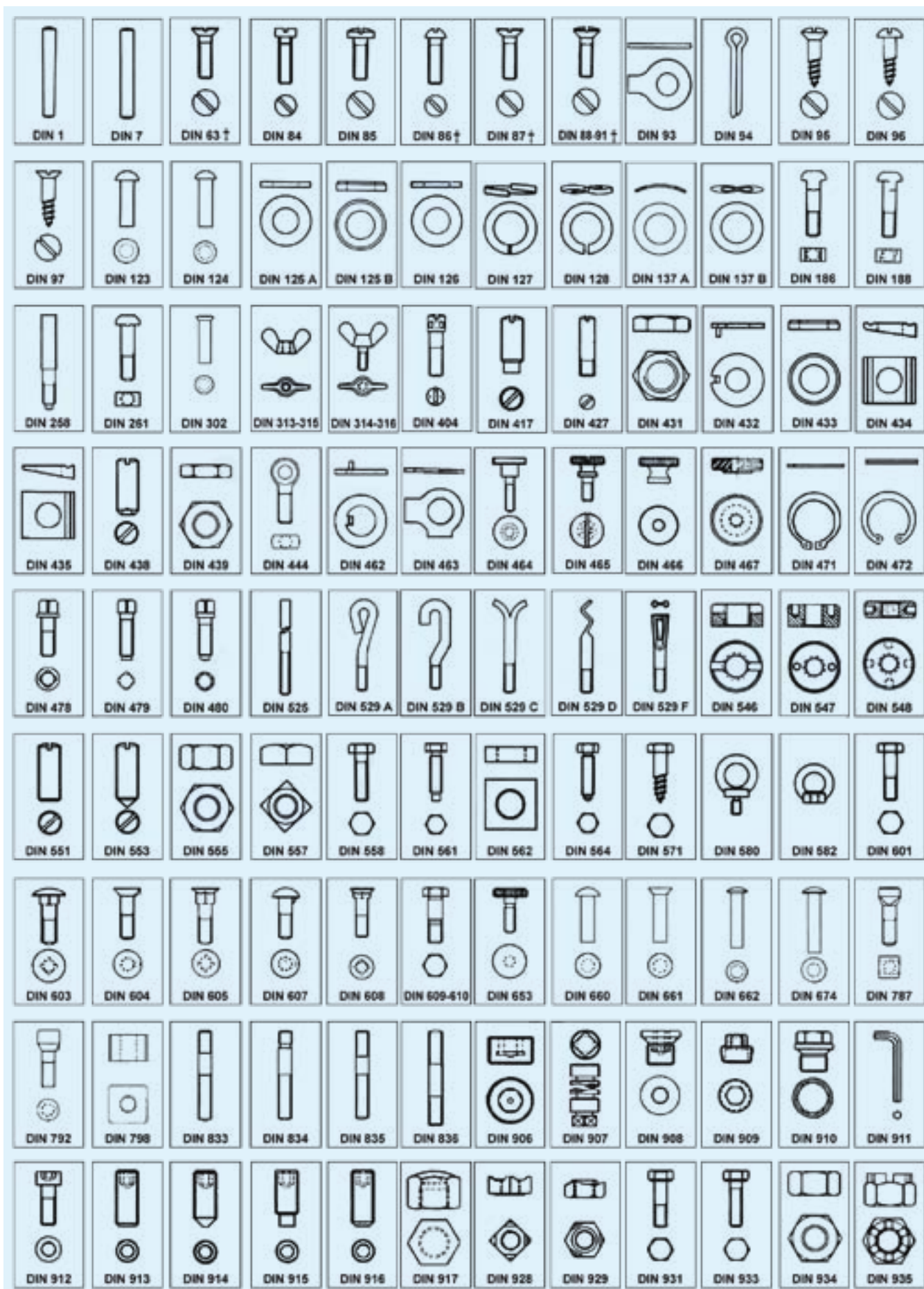
FASTENER TERMINOLOGY

Term	Definition
Eye Bolt	A bolt with a circular ring on the head end. Used for attaching rope or chain.
Fillister Head	Similar to a pan head but with a smaller head diameter and a taller head, with higher vertical sides.
Finishing Washer	A washer designed for use with countersunk screws. Used to enhance appearance in some applications.
Flange Bolt	A bolt with a built in washer-like flange just below the head.
Flat Head	A flat head with a conical bearing surface. Designed to be Countersunk.
Flex Lock	A type of lock nut where the top of the nut has been slotted and bent inward. When assembled the pressure on the threads prevents the nut from backing off.
Hanger Bolt	A double ended bolt with machine threads on one end (takes a nut) and wood threads on the other end.
Hardened	A fastener that has been heat treated to increase strength. Grade 5, Grade 8 and alloy steel bolts are hardened.
Head Style	The type of head or top that is on the fastener. Such as a Round head or Hex head.
Heli-Coil	A system for re-threading stripped internal threads. A proprietary tap is used to re-thread the hole and a spring like insert is placed inside to make up the difference in width, allowing the original size bolt to be used.
Hex Bolt	A bolt with a six sided head.
Hex Head	A head with six vertical sides and a flat bearing surface.
Internal Thread	Thread on the inside of a cylindrical hole.
Jam Nut	A thinner pattern of nut, sometimes used as a second nut to 'jam' another nut in place preventing loosening.
Knurl	A pattern of ridges on the surface to provide grip.
Left Hand Thread	Thread that is formed opposite to normal thread so it tightens counter clockwise. Used on spinning equipment to prevent loosening. Generally custom made.
Length of Engagement	The length of the part of the fastener where the threads are engaged (in) the material being fastened.
Lock Nut	Any nut with a special design to help prevent backing off.
Major Diameter	The diameter from the top of the thread on one side, to the top of the thread on the other side.
Nylock Nut	A nut with a nylon insert to help prevent backing off.
One way screw	A fastener designed so it can be installed with a slotted screw driver but can not be removed. Used to prevent tampering.
Oval Head	A countersunk screw with a slightly rounded top surface for a more finished look.
Pan Head	A head with a slightly rounded top surface and short vertical sides.
Pilot Point	An unthreaded cylindrical tip that is smaller than the fastener diameter. Used to help speed alignment during assembly. Also called a Dog Point.
Pitch	The distance from one thread to the next along the length of the fastener. Used mostly in metric, where it is expressed in millimeters.
Plow Bolt	A bolt with a smooth flat countersunk head that has a small square section underneath. Used on plows.
Reverse Thread	Thread that is formed opposite to normal thread so it tightens counter clockwise. Used on spinning equipment to prevent loosening.
Roll Thread	Threads formed by tightly pressing or rolling the piece of stock between serrated dies. This is the most common method of creating threaded fasteners today.

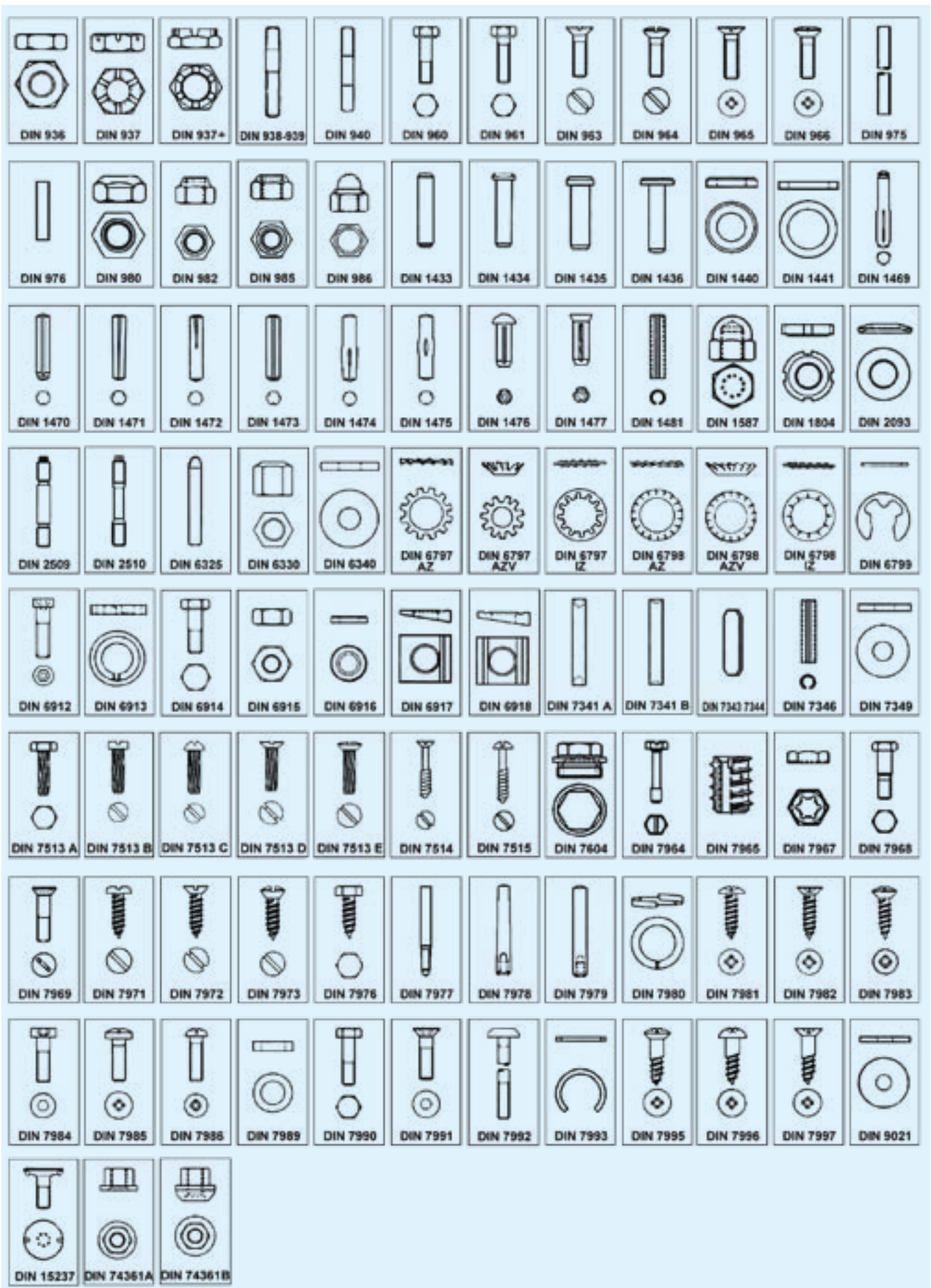
FASTENER TERMINOLOGY

Term	Definition
Set Screw	A machine screw with no head usually used to secure parts on a shaft.
Shank	The smooth part of the bolt above the threads. Also called the body.
Shank Diameter	The diameter of the shank or smooth part of the bolt above the threads.
Slotted nut	A nut with slots cut into it for the insertion of a cotter pin. Used with a drilled shank fastener. Similar to a castle nut.
Square Bolt	A bolt with a four sided head
Starter Tap	A special tap for starting the creation of internal threads. Must be followed with a regular tap.
Stove Bolt	Machine screws, generally slotted, packaged with nuts.
Stud	A double ended bolt or piece of threaded rod. Often used in machine and automotive applications.
T nut	A thin nut with a flange on one end. Intended to be inserted in a hole, in wood, with the flange on the surface. Used to allow a bolt to be fastened in wood without a protruding nut.
Tap	The tool used to create internal threads in a hole or the act of creating such threads. See also Bottom Tap, and Starter Tap.
Tap Bolt	A fully threaded bolt.
Tensile Strength	The maximum load in tension (pulling apart) that a bolt can withstand before failure.
Thread Engagement	The percentage of the thread height that is in the material being fastened. For full thread engagement the pilot hole should be equal to or smaller than the Root Diameter of the fastener.
Thread Series	A term used to describe the number of threads per inch for a given diameter.
Threaded Fastener	Any fastener with threads such as a screw or bolt.
Through Hardened	A bolt that has been heat treated all the way through. More brittle but stronger than a Case Hardened bolt. Also called Fully Hardened.
Truss Head	An extra wide low profile head with a slightly rounded top surface.
U Bolt	A bolt in the shape of a U, threaded on both ends.
Undercut Head	A countersunk head that has been cut off at 70% of the normal height. Screws in this style will have a second flat surface parallel to the top just before the threads. Used frequently in extremely short screws to provide more thread.
Unified Coarse Thread (UNC)	The standard US thread pattern.
Unified Fine Thread (UNF)	The standard US thread pattern for fine thread.
Whitworth / Whitworth Thread	A British thread standard that is no longer in use.
Wing Nut	A nut with 'wings' for easy manual assembly.
Yield Strength	The maximum load at which a material exhibits a specific permanent deformation.

DIN STANDARDS



DIN STANDARDS



TECHNICAL INFO

Designation System for Stainless Steel (ISO 3506 1979)

Composition Groups	Austenitic			Ferritic		Martensitic		
Identification of Steel Grades	A1, A2, A4			F1		C1, C4		C3
Property Class	50	70	80	45	60	50	70	80
	Soft	Cold Worked	High Strenght	Soft	Cold Worked	Soft	Hardened and Tempered	Hardened and Tempered

Stainless Steel Properties

Extract from DIN 267 Part 11 - Chemical Composition of austenitic chromium - nickels steels in % by weight

Austenitic Grade	Material No. to AISI	C	Si	Mn	P	S	Cr	Mo	Ni
A1	303	0.12	1.0	2.0	0.20	0.15 to 0.35	17.0 to 19.0	0.6	8.0 to 10.0
A2	304	0.08	1.0	2.0	0.20	0.03	17.0 to 20.0	-	8.0 to 13.0
A3	316	0.08	1.0	2.0	0.20	0.03	16.0 to 18.5	2.0 to 3.0	10.0 to 14.4

* Maximum values unless otherwise stated.

* Types A2 and A4 may contain up to a maximum of 4% copper.

* The selection of steel grades within a group is the prerogative of the manufacturer, unless the purchaser has specified particular steels to ISO or national standards.

* Different grades of steel may be used as long as all physical and mechanical properties and the corresponding corrosion resistance of the finished products are achieved. Only when all these conditions are fulfilled may finished articles be marked in accordance with DIN 267.

Mechanical Properties - Austenitic Grades Bolts, Screws and Studs

Grade	Property Class	Tensile Strength Rm Mpa (Nmm ²) minimum	Yield Stress Rp 0.2 Mpa (Nmm ²) minimum	Elongation AL minimum	Proof Load Stress Sp Mpa (Nmm ²) minimum	Diameter Range
A2 and A4	70	700	450	0.4d	700.00	= <M20
	80	800	600	0.3d	800.00	= <M20

Comparison: US and ISO (Din) Stainless Steels Tensile Load

Composition Groups	Austenitic			Ferritic		Martensitic		
Identification of Steel Grades	A1, A2, A4			F1		C1, C4		C3
Property Class	50	70	80	45	60	50	70	80
	Soft	Cold Worked	High Strenght	Soft	Cold Worked	Soft	Hardened and Tempered	Hardened and Tempered

A2 and A4 as compared to 304 and 316	Percent difference from US - Stainless Stell
up to M20	44 % higher
M22 and over	6 % lower

TECHNICAL INFO

Selection of Diameter Tightening Torques, Loads

Guideline values for screw in steel groups A2-70 and A4-70 with standard metric threads to DIN 13

Diameter	Load force at 0.2% yield point N	Initial Stressing Force N	Nmm	Force in service N		
				Axial Static	Axial Dynamic	Radial Static or Dynamic
M3	2250	1420	0.9	610	360	120
M4	3960	2490	2.2	1070	640	210
M5	6390	4030	4.3	1730	1040	350
M6	9040	5700	7.3	2440	1470	490
M8	16470	10380	17.7	4450	2670	890
M10	26100	16440	35.5	7050	4230	1410
M12	37930	23900	61.3	10240	6150	2050
M16	70650	44510	147.1	19080	11450	3820
M20	110250	69460	285.1	29770	17860	5950

Notes on application;

When selecting the correct screw diameter it should be ensured that the total load on the screw does not exceed 90% of the standardized 0.2% yield stress. Care should be taken to ensure correct initial tensioning, with a torque wrench possible.

Experience has shown that a utilization of 70% of the total load is reasonable average for the initial stressing force to allow additional forces in service to be taken up.

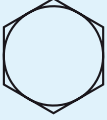
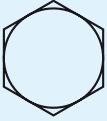
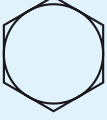
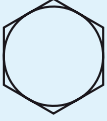
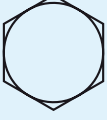
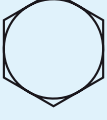
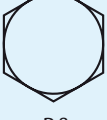
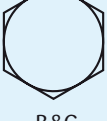
The table above is only intended as an aid for quick comparison

Comparative International Stainless Steel Grades

British	French	German	Italian	Japanese	Swedish	USA
304S21	Z12CN17.08	1.431	X12CrNi 17 07	SUS301	14 23 31	301
304S31				SUS302	14 23 32	302
304S16	Z8CN18.09	1.430	X5CrNi 18 10	SUS301	14 23 33	304
304S15						
304S11	Z2CN18.10	1.431	X2CrNi 18 11	SUS304L	14 23 52	304L
305S19	Z8CN18.12		X8CrNi 18 12	SUS305		305
309S24	Z15CN24.13		X16CrNi 23 14	SUS309		309
310S24	Z12CN25.20	1.485	Z22CrNi 25 20	SUS310S	14 23 61	310
315S16					14 23 40	
316S31	Z6CND17.11	1.440	X8CrNiMo 17 13	SUS316	14 23 43	316
316S33		1.444			14 23 47	
316S11	Z2CND17.12	1.440	X2CrNiMo 17 12	SUS316L	14 23 53	316L
316S13		1.444			14 23 48	
317S12	Z2CND19.15	1.444	X2CrNiMo 18 16	SUS317L	14 23 67	317L
317S16		1.444		SUS317	14 23 66	317
320S31	Z8CND17.12	1.457			14 23 50	
320S33		1.457				
321S31	Z6CNT18.12	1.454	X6CrNiTi 18 11	SUS321	14 23 37	321
347S31	Z6CNNb18.11	1.456	X6CrNiNb 18 11 X8CrNiNb 18 11	SUS347	14 23 38	347
403S17	Z6C13	1.400	X6CrTi3	SUS403	14 23 01	403
405S17	Z6CA13	1.400	Z6CrA1 13	SUS405		405
409S19		1.451				409
430S17	Z8C17	1.402	X8Cr 17	SUS430	14 23 20	430
434S17	Z8CD17.01	1.411	X8CrMo 17	SUS434	14 23 25	434
410S21	Z12C13	1.401	X12Cr 13	SUS410	13 23 02	410
410S45	Z30C13	1.402	X30Cr 13	SUS420J5	14 23 04	420

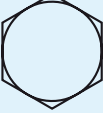
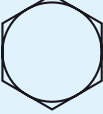
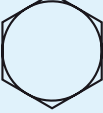
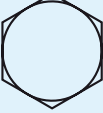
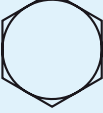
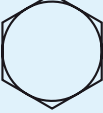
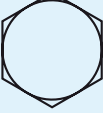
TECHNICAL INFO

ASTM, SAE and ISO GRADE MARKING and MECHANICAL PROPERTIES for STEEL FASTENERS

Identifications Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min. (psi)	Tensile Strength Min. (psi)
 No Grade Mark	SAE J429 Grade 1	Bolts, Screws, Studs	Low or Medium Carbon Steel	1/4 thru 1-1/2	33,000	36,000	60,000
	ASTM A307 Grades A&B		Low Carbon Steel	1/4 thru 4	-	-	
	SAE J42 9 Grade 2		Low or Medium Carbon Steel	1/4 thru 3/4 Over 3/4 to 1-1/2	55,000 33,000	57,000 36,000	74,000 60,000
 No Grade Mark	SAE J429 Grade 4	Studs	Medium Carbon Cold Drawn Steel	1/4 thru 1-1/2	-	100,000	115,000
 B5	ASTM A193 Grades B5		AISI 501	1/4 Thru 4	-	80,000	100,000
 B6	ASTM A193 Grades B6		AISI 401			85,000	110,000
 B7	ASTM A193 Grades B7		AISI 4140, 4142, or 4105	1/4 thru 2-1/2 Over 2-1/2 thru 4 Over 4 thru 7	-	105,000 95,000 75,000	125,000 115,000 100,000
 B16	ASTM A193 Grades B16		CrMoVa Alloy Steel			105,000 95,000 85,000	125,000 115,000 100,000
 B8	ASTM A193 Grades B8		AISI 304	1/4 and larger	-	30,000	75,000
 B8C	ASTM A193 Grades B8C		AISI 347				
 B8M	ASTM A193 Grades B8M		AISI 316				

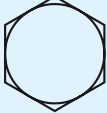
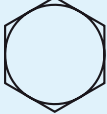
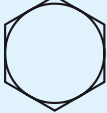
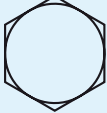
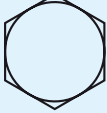
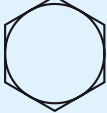
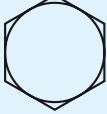
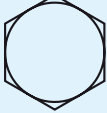
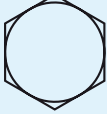
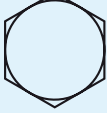
TECHNICAL INFO

ASTM, SAE and ISO GRADE MARKING and MECHANICAL PROPERTIES for STEEL FASTENERS

Identifications Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min. (psi)	Tensile Strength Min. (psi)
 B8T	ASTM A193 Grades B8T	Bolts, Screws, Studs for High Temperature Service	AISI 321	1/4 and larger	-	30,000	75,000
 B8	ASTM A193 Grades B8		AISI 304 Strain Hardened	1/4 thru 3/4 Over 3/4 thru 1 Over 1 thru 1-1/4 Over 1-1/4 thru 1-1/2	-	100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000
 B8C	ASTM A193 Grades B8C		AISI 347 Strain Hardened				
 B8M	ASTM A193 Grades B8M		AISI 316 Strain Hardened			95,000 80,000 65,000 50,000	110,000 100,000 95,000 90,000
 B8T	ASTM A193 Grades B8T		AISI 321 Strain Hardened			100,000 80,000 65,000 50,000	125,000 115,000 105,000 100,000
 L7	ASTM A320 Grades L7	Bolts, Screws, Studs for Low Temperature Service	AISI 4140, 4142 or 4145	1/4 thru 2-1/2	-	105,000	125,000
 L7A	ASTM A320 Grades L7A		AISI 4037				
 L7B	ASTM A320 Grades L7B		AISI 4137				
 L7C	ASTM A320 Grades L7C		AISI 8740				
 L43	ASTM A320 Grades L43		AISI 4340	1/4 thru 4	-	105,000	125,000

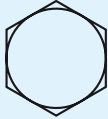
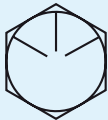
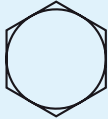
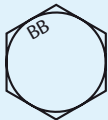
TECHNICAL INFO

ASTM, SAE and ISO GRADE MARKING and MECHANICAL PROPERTIES for STEEL FASTENERS

Identifications Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min. (psi)	Tensile Strength Min. (psi)
 B 8	ASTM A320 Grades B8	Bolts, Screws, Studs for Low Temperature Service	AISI 304	1/4 and larger	-	30,000	75,000
 B 8 C	ASTM A320 Grades B8C		AISI 347				
 B 8 T	ASTM A320 Grades B8T		AISI 321				
 B 8 F	ASTM A320 Grades B8F		AISI 303 or 303Se				
 B 8 M	ASTM A320 Grades B8M		AISI 316				
 B 8	ASTM A320 Grades B8		AISI 304	1/4 thru 3/4 Over 3/4 thru 1 Over 1 thru 1-1/4 Over 1-1/4 thru 1-1/2	-	100,000 80,000 65,00 50,00	100,000 80,000 65,00 50,00
 B 8 C	ASTM A320 Grades B8C		AISI 347				
 B 8 F	ASTM A320 Grades B8F		AISI 303 or 303Se				
 B 8 M	ASTM A320 Grades B8M		AISI 316				
 B 8 T	ASTM A320 Grades B8T		AISI 321				

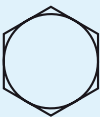
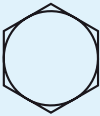
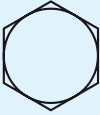
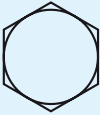
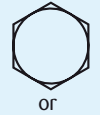
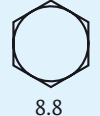
TECHNICAL INFO

ASTM, SAE and ISO GRADE MARKING and MECHANICAL PROPERTIES for STEEL FASTENERS

Identifications Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties		
					Proof Load (psi)	Yield Strength Min. (psi)	Tensile Strength Min. (psi)
	SAE J429 Grade 5	Bolts, Screws, Studs	Medium Carbon Steel, Quenched and Tempered	1/4 thru 1 Over 1 to 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
	ASTM A449			1/4 thru 1 Over 1 to 1-1/2 Over 1-1/2 thru 3	85,000 74,000 55,000	92,000 81,000 58,000	120,000 105,000 90,000
	SAE J429 Grade 5.1	Sems	Low or Medium Carbon Steel, Quenched and Tempered	No. 6 thru 3/8	85,000	-	120,000
	SAE J429 Grade 5.2	Bolts, Screws, Studs	Low Carbon Martensitic Steel, Quenched and Tempered	1/4 thru 1	85,000	92,000	120,000
 A325	ASTM A325 Type 1	High Strength Structural Bolts	Medium Carbon Steel, Quenched and Tempered	1/2 thru 1 1-1/8 thru 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
 A325	ASTM A325 Type 2		Low Carbon Martensitic Steel, Quenched and Tempered	1/2 thru 1	85,000	92,000	120,000
 A325	ASTM A325 Type 3		Atmospheric Corrosion Resisting Steel Quenched and Tempered	1/2 thru 1 1-1/8 thru 1-1/2	85,000 74,000	92,000 81,000	120,000 105,000
 BB	ASTM A354 Grade BB	Bolts, Studs	Alloy Steel, Quenched and Tempered	1/4 thru 2-1/2 2-3/4 thru 4	80,000 75,000	83,000 78,000	105,000 100,000
 BC	ASTM A354 Grade BC				105,000 95,000	109,000 99,000	125,000 115,000

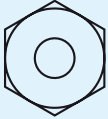
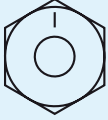
TECHNICAL INFO

ASTM, SAE and ISO GRADE MARKING and MECHANICAL PROPERTIES for STEEL FASTENERS

Identifications Grade Mark	Specification	Fastener Description	Material	Nominal Size Range (in.)	Mechanical Properties			
					Proof Load (psi)	Yield Strength Min. (psi)	Tensile Strength Min. (psi)	
	SAE J429 Grade 7	Bolts Screws	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 1-1/2	105,000	115,000	133,000	
	SAE J429 Grade 8	Bolts, Screws, Studs	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 1-1/2	120,000	130,000	150,000	
	ASTM A354 Grade BD		Alloy Steel, Quenched and Tempered					
 No Grade Mark	SAE J429 Grade 8.1	Studs or	Medium Carbon Alloy SAE 1041 Modified Elevated Temperature Drawn Steel	1/4 thru 1-1/2	120,000	130,000	150,000	
 A490	ASTM A490	High Strength Structural Bolts	Alloy Steel, Quenched and Tempered	1/2 thru 1-1/2	120,000	130,000	150000 min. 170,000 max.	
 No Grade Mark	ISO R898 Class 4.6	Bolts Screws, Studs	Medium Carbon Steel, Quenched and Tempered	All sizes thru 1-1/2	33,000	36,000	60,000	
 No Grade Mark	ISO R898 Class 5.8				55,000	57,000	74,000	
8.8  or  8.8	ISO R898 Class 8.8		Alloy Steel, Quenched and Tempered		85,000	92,000	120,000	
10.9  or  10.9	ISO R898 Class 10.9				120,000	130,000	150,000	

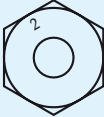
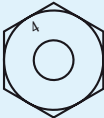
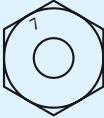
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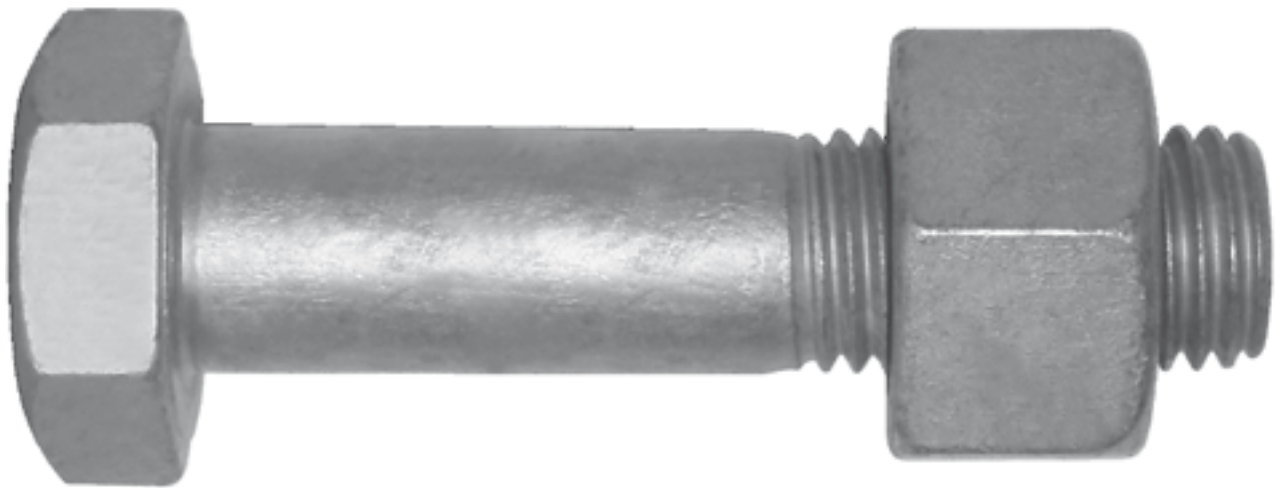
FASTENER IDENTIFICATION MARKING

Grade Identifications Marking	Specification	Materials	Nominal Size In.	Proof Load Stress ksi	Hardness Rockwell		See Note
					Min.	Max.	
 No Mark	ASTM A563 - Grade 0	Carbon Steel	1/4 thru 1-1/2	69	B55	C32	3,4
	ASTM A563 - Grades A	Carbon Steel	1/4 thru 1-1/2	90	B68	C32	3,4
	ASTM A563 - Grade B	Carbon Steel	1/4 thru 1	120	B69	C32	3,4
			Over 1 thru 1-1/2	105			
	ASTM A563 - Grades C	Carbon Steel maybe Quenched and Tempered	1/4 thru 1-1/2	144	B78	C38	5
	ASTM A563 Grades C3	Atmospheric Corrosion Resistant Steel maybe Quenched and Tempered	1/4 thru 1-1/2	144	B78	C38	5,9
	ASTM A563 Grades D	Carbon Steel maybe Quenched and Tempered	1/4 thru 1	150	B84	C38	6
	ASTM A563 Grades DH	Carbon Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	6
	ASTM A563 Grades DH3	Atmospheric Corrosion Resistant Steel Quenched and Tempered	1/4 thru 4	175	C24	C38	5.9
	ASTM A194 - Grade 1	Carbon Steel	1/4 thru 4	130	B70	-	7

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FASTENER IDENTIFICATION MARKING

Grade Identifications Marking	Specification	Materials	Nominal Size In.	Proof Load Stress ksi	Hardness Rockwell		See Note
					Min.	Max.	
	ASTM A194 - Grades 2	Medium Carbon Steel	1/4 thru 4	150	159	352	7,8
	ASTM A194 - Grades 2H	Medium Carbon Steel, Quenched and Tempered	1/4 thru 4	175	C24	C38	7
	ASTM A194 - Grades 2HM	Medium Carbon Steel, Quenched and Tempered	1/4 thru 4	150	159	237	7,8
	ASTM A194 - Grades 4	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 4	175	C24	C38	7
	ASTM A194 - Grades 7	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 4	175	C24	C38	7
	ASTM A194 - Grades 7M	Medium Carbon Alloy Steel, Quenched and Tempered	1/4 thru 4	150	159	237	7



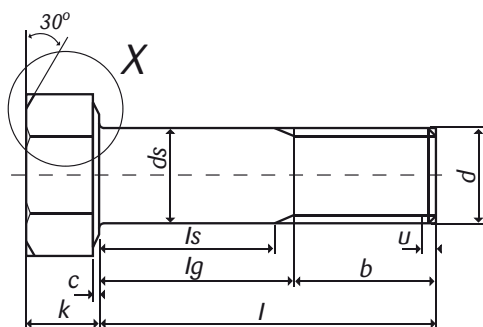
STRUCTURAL BOLTS

STRUCTURAL BOLTS

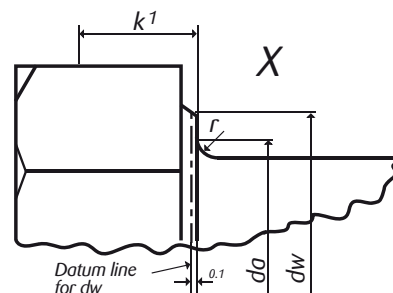
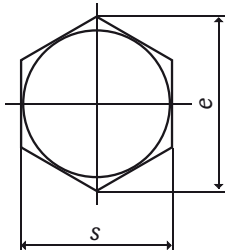


STRUCTURAL BOLTS

A325M - Heavy Hex Structural Bolts (Metric) Dimensions



$u = 2P$ maximum: incomplete thread



Thread size d		M16	M20	M22	M24	M27	M30	M36
P pitch of thread		2	2.5	2.5	3	3	3.5	4
b	Bolt ≤ 100	31	36	38	41	44	49	56
	Bolt > 100	38	43	45	48	51	56	63
ds	min.	15.30	19.16	21.16	23.16	26.16	29.16	35.00
	max.	16.70	20.84	22.84	24.84	27.84	30.84	37.00
s	min.	26.16	33.00	35.00	40.00	45.00	49.00	58.80
	max.	27.00	34.00	36.00	41.00	46.00	50.00	60.00
e	min.	29.56	37.29	39.55	45.20	50.85	55.37	66.44
	max.	31.18	39.26	41.57	47.34	53.12	57.74	69.28
k	min.	9.25	11.60	13.10	14.10	16.10	17.65	21.45
	max.	10.75	13.40	14.90	15.90	17.90	19.75	23.55
k ¹	min.	6.5	8.1	9.2	9.9	11.3	12.4	15.0
dw ¹	min.	24.9	31.4	33.3	38.0	42.8	46.5	55.9
c	min.	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	max.	0.8	0.8	0.8	0.8	0.8	0.8	0.8
da	max.	18.2	22.4	24.4	26.4	30.4	33.4	39.4
r	min.	0.6	0.8	0.8	1.0	1.2	1.2	1.5
1) The maximum value of dw shall not exceed the actual width across flats								

Materials

Medium carbon, carbon boron, medium carbon alloy or alloy boron steel in accordance with ASTM A325M

Characteristic		Standard
Materials & Manufacture		ASTM A325M
Finish / Coatings	Self Colour / Black	ASTM A325M
	Hot Dip Galvanized	ASTM A153 / A153M Class C
Mechanical Properties		ASTM A325M
Dimensions & Tolerances		ASME B18.2.3.7M
Threads		ASME B1.13M tolerance class 6g
Workmanship		ASTM F788 / F788M
Product Marking		ASTM A325

A325M Bolt Length Tolerances for Bolt Diameters M16-M36 inc.	
Nominal Length	Length Tolerance
Up to and including 50	± 1.2
Over 50 up to and including 80	± 1.5
Over 80 up to and including 120	± 1.8
Over 120 up to and including 150	± 2.0
Over 150	± 4.0

All dimensions are in millimeters

STRUCTURAL BOLTS

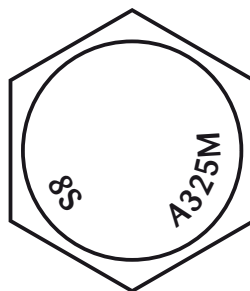
A325M - Heavy Hex Structural Bolts (Metric)

Maximum Grip Gauging Length and Minimum Body Lengths

Nominal bolt dia. & thread pitch	M16 x 2		M20 x 2.5		M22 x 2.5		M24 x 3		M27 x 3		M30 x 3.5		M36 x 4	
l Nominal length	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min
45	14	8												
50	19	13	14	6.5										
55	24	18	19	11.5	17	9.5								
60	29	23	24	16.5	22	14.5	19	10						
65	34	28	29	21.5	27	19.5	24	15	21	12				
70	39	33	34	26.5	32	24.5	29	20	26	17	21	10.5		
75	44	38	39	31.5	37	29.5	34	25	31	22	26	15.5		
80	49	43	44	36.5	42	34.5	39	30	36	27	31	20.5	24	12
85	54	48	49	41.5	47	39.5	44	35	41	32	36	25.5	29	17
90	59	53	54	46.5	52	44.5	49	40	46	37	41	30.5	34	22
95	64	58	59	51.5	57	49.5	54	45	51	42	46	35.5	39	27
100	69	63	64	56.5	62	54.5	59	50	56	47	51	40.5	44	32
110	72	66	67	59.5	65	57.5	62	53	59	50	54	43.5	47	35
120	82	76	77	69.5	75	67.5	72	63	69	60	64	53.5	57	45
130	92	86	87	79.5	85	77.5	82	73	79	70	74	63.5	67	55
140	102	96	97	89.5	95	87.5	92	83	89	80	84	73.5	77	65
150	112	106	107	99.5	105	97.5	102	93	99	90	94	83.5	87	75
160	122	116	117	109.5	115	107.5	112	103	109	100	104	93.5	97	85
170	132	126	127	119.5	125	117.5	122	113	119	110	114	103.5	107	95
180	142	136	137	129.5	135	127.5	132	123	129	120	124	113.5	117	105
190	152	146	147	139.5	145	137.5	142	133	139	130	134	123.5	127	115
200	162	156	157	149.5	155	147.5	152	143	149	140	144	133.5	137	125
210	172	166	167	159.5	165	157.5	162	153	159	150	154	143.5	147	135
220	182	176	177	169.5	175	167.5	172	163	169	160	164	153.5	157	145
230	192	186	187	179.5	185	177.5	182	173	179	170	174	163.5	167	155
240	202	196	197	189.5	195	187.5	192	183	189	180	184	173.5	177	165
250	212	206	207	199.5	205	197.5	202	193	199	190	194	183.5	187	175
260	222	216	217	209.5	215	207.5	212	203	209	200	204	193.5	197	185
270	232	226	227	219.5	225	217.5	222	213	219	210	214	203.5	207	195
280	242	236	237	229.5	235	227.5	232	223	229	220	224	213.5	217	205
290	252	246	247	239.5	245	237.5	242	233	239	230	234	223.5	227	215
300	262	256	257	249.5	255	247.5	252	243	249	240	244	233.5	237	225

lg is grip gauging length; ls is body length

A325M Head Marking



A325M Bearing Surface Runout and Straightness		
Nominal bolt dia	Runout Bearing Surface max (mm)	Straightness max (mm/mm)
M16	0.48	0.006
M20	0.59	0.006
M22	0.63	0.006
M24	0.70	0.006
M27	0.77	0.006
M30	0.77	0.006
M36	1.01	0.006

All dimensions are in millimeters

STRUCTURAL BOLTS

A325M - Heavy Hex Structural Bolts (Metric) Tensile Load and Proof Load Requirements for Full-Size Bolts

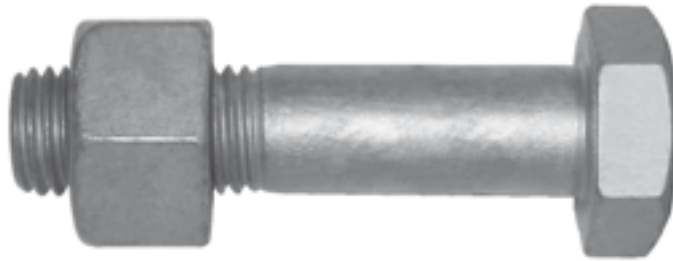
Recommended Tightening Torques and Induced Loads			
Thread Size and Pitch	Stress Area	Un - lubricated Finish	Induced Load
	MM2	Nm	KN
M12 - 1.75	84.30	93.47	38.9
M16 - 2.00	157	232 - 11	72.534
M20 - 2.50	245	452.76	112.19
M22 - 2.50	303	615.94	139.99
M24 - 3.00	353	782.81	163.09
M27 - 3.00	459	1,145.11	212.06
M30 - 3.50	561	1,555.10	259.18
M36 - 4.00	817	2,717.67	377.45

Nominal Dia, & Thread Pitch	Stress Area	Tensile Load min	Proof Load #	Alternative Proof Load*	Hardness Rockwell HRC	
	mm ²	kN	kN	kN	min	max
M16 x 2	157	130	94.2	104	25	34
M20 x 2.5	245	203	147	162	25	34
M22 x 2.5	303	251	182	200	25	34
M24 x 3	353	293	212	233	25	34
M27 x 3	459	381	275	303	19	30
M30 x 3.5	561	466	337	370	19	30
M36 x 4	817	678	490	539	19	30
# Proof load determined by length measurement method						
* Alternative Proof load determined by yield strength method						

A325M Tensile Strength Requirements for Specimens Machined from Bolts				
Nominal Dia,	Tensile Strength min	Yield Strength min	Elongation in 4D min	Reduction of Area min
	MPa	MPa	%	%
M16 to M36 inc	830	660	14	35

STRUCTURAL BOLTS

A325M - Heavy Hex Structural Bolts (Metric)
A325M Bolt Finish Weight - Kilos/100



Bolt Dia Bolt Length		M16	M20	M22	M24	M27	M30	M36
45		10.71						
50		11.38	18.85					
55		12.04	20.10	25.58				
60		12.70	21.40	26.85	33.76			
65		13.36	22.60	28.12	35.21	48.40		
70		14.02	23.87	29.39	36.66	50.64	60.66	
75		14.68	25.13	30.44	38.11	52.88	63.43	
80		15.34	26.40	31.93	39.56	55.12	66.21	124.50
85		16.00	27.69	33.20	41.01	57.36	68.98	128.50
90		16.66	28.90	34.47	42.46	59.60	71.76	132.50
95		17.32	30.15	35.74	43.91	61.84	74.53	135.40
100		17.98	31.50	37.01	45.36	64.08	77.30	141.30
110		19.55	34.00	39.99	48.91	68.57	82.84	149.29
120		21.13	36.44	42.97	52.46	73.06	88.39	157.28
130		22.71	38.95	45.96	56.01	77.56	93.94	165.27
140		24.29	41.50	48.94	59.56	82.05	99.49	173.26
150		25.87	44.00	51.93	63.11	86.55	105.04	181.25
160		27.44	46.50	54.91	66.66	91.04	110.59	189.24
170		29.02	49.02	57.89	70.21	95.54	116.15	197.23
180		30.60	51.53	60.88	73.77	100.03	121.69	205.22
190		32.18	54.40	63.86	77.32	104.53	127.23	213.21
200		33.76	56.60	66.85	80.87	109.02	132.78	221.20
210		35.34	59.10	69.83	84.42	113.52	138.32	229.19
220		36.91	61.70	72.81	87.97	118.01	143.87	237.18
230		38.49	64.11	75.80	91.52	122.50	149.42	245.17
240		40.07	66.65	78.78	95.07	127.00	154.97	253.16
250		41.65	69.20	81.77	98.62	131.49	160.52	261.15
260		43.23	71.70	84.75	102.18	135.99	166.07	269.14
270		44.81	74.20	87.73	105.73	140.48	171.62	277.13
280		46.38	76.70	90.72	109.28	144.98	177.17	285.12
290		47.96	79.25	93.70	112.83	149.47	182.71	293.11
300		49.54	81.90	96.69	116.38	153.97	188.26	301.10

Weights are for guidance only and may vary in line with product tolerances

All dimensions are in millimeters

STRUCTURAL BOLTS

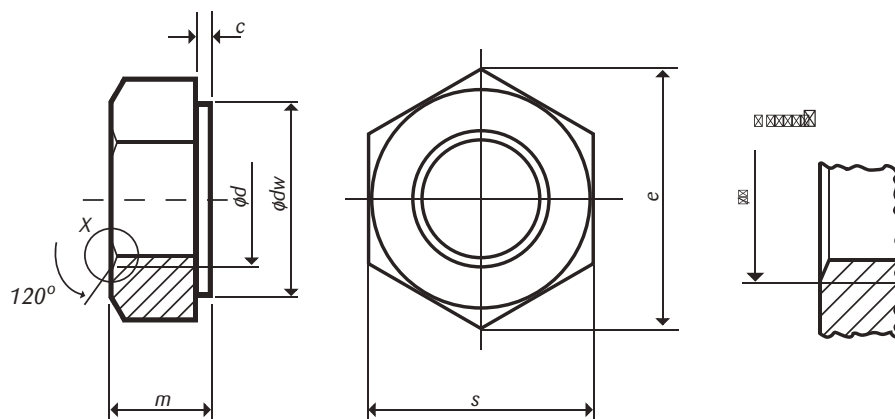
Heavy Hex Nuts (Metric) - for use with ASTM A325M Bolts
A563M Nut Dimension Classes 8S & 10S

Nominal size and thread pitch d	s		e		m		dw ¹⁾	c		Total
	max	min	max	min	max	min	min	max	min	max
M16 x 2	27.00	26.16	31.18	29.56	17.1	16.4	24.9	0.8	0.4	0.47
M20 x 2.5	34.00	33.00	39.26	37.29	20.7	19.4	31.4	0.8	0.4	0.58
M22 x 2.5	36.00	35.00	41.57	39.55	23.6	22.3	33.3	0.8	0.4	0.63
M24 x 3	41.00	40.00	47.34	45.20	24.2	22.9	38.0	0.8	0.4	0.72
M27 x 3	46.00	45.00	53.12	50.85	27.6	26.3	42.8	0.8	0.4	0.80
M30 x 3.5	50.00	49.00	57.74	55.37	30.7	29.1	46.6	0.8	0.4	0.87
M36 x 4	60.00	58.80	69.28	66.44	36.6	35.0	55.9	0.8	0.4	1.05
1) The maximum dw shall not exceed the actual width across flats										

Materials

Carbon and carbon alloy steel in accordance with ASTM A563M classes 8S & 10S

Characteristic		Standard
Materials & Manufacture		ASTM A563M Classes 8S & 10S
Finish / Coatings	Self Colour / Black	ASTM A563M
	Hot Dip Galvanized	ASTM A153 / A153M Class C
Mechanical Properties	Self Colour / Black	ASTM A563M Class 8S
	Hot Dip Galvanized	ASTM A563M Class 10S
Dimensions & Tolerances		ANSI B18.2.4.6M
Threads	Self Colour / Black	ASME B1.13M tolerance class 6H
	Hot Dip Galvanized	ASTM A563M Clause 7.8
Workmanship		ASTM F812 / F812M
Product Marking		ASTM A563M Classes 8S & 10S



All dimensions are in millimeters

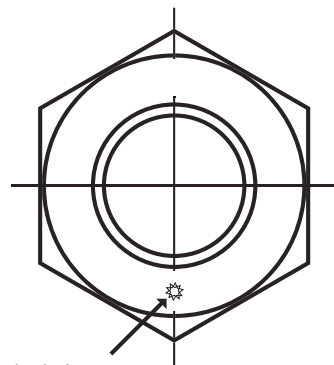
STRUCTURAL BOLTS

Heavy Hex Nuts (Metric) - for use with ASTM A325M Bolts
A563M Nut Proof Loads & Nut Hardness

Nominal size and thread pitch	Proof Loads		Hardness			
	8S	10S	8S		10S	
	Self Colour / Black (6H fit)	Hot Dip Galvanized Overtapped	Self Colour / Black (6H fit)		Hot Dip Galvanized Overtapped	
	kN	kN	min	max	min	max
M16 x 2	169	183	89	38	26	38
M20 x 2.5	263	285	89	38	26	38
M22 x 2.5	326	353	89	38	26	38
M24 x 3	379	411	89	38	26	38
M27 x 3	493	535	89	38	26	38
M30 x 3.5	603	654	89	38	26	38
M36 x 4	878	952	89	38	26	38

ASTM A563M Nut finish weight - Kilos/100

M12	M16	M20	M22	M24	M27	M30	M36
2.80	5.20	7.99	10.64	17.65	22.90	29.39	49.90
Weights are for guidance only and may vary in line with product tolerances							



* Property Class Identification
Self Colour/Black = 8S
Hot Dip Galvanized = 10S

A563M Nut Marking

All dimensions are in millimeters

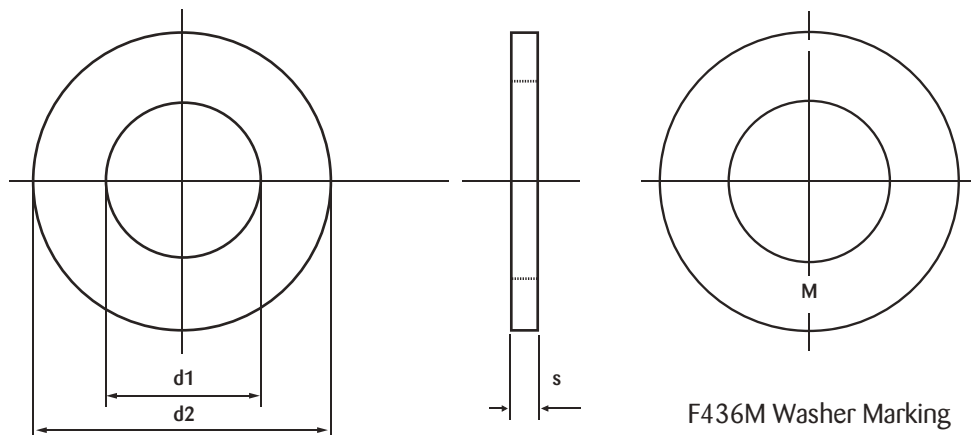
STRUCTURAL BOLTS

Hardened Steel Washers (Metric) - for use with ASTM A325M Bolts F436M Washer Dimensions

Nominal Washer Size		M16	M20	M22	M24	M27	M30	M36
d ₁	max	18.4	22.5	24.5	26.5	30.5	33.6	39.6
	min	18.0	22.0	24.0	26.0	30.0	33.0	39.0
d ₂	max	34.0	42.0	44.0	50.0	56.0	60.0	72.0
	min	32.4	40.4	42.4	48.4	54.1	58.1	70.1
h	max	4.6	4.6	4.6	4.6	4.6	4.6	4.6
	min	3.1	3.1	3.4	3.4	3.4	3.4	3.4

Materials
Carbon steel in accordance with ASTM F436M

Characteristic		Standard
Materials & Manufacture		ASTM F436M
Finish / Coatings	Self Colour / Black	ASTM A436M
	Hot Dip Galvanized	ASTM A153 / A153M Class C
Mechanical Properties		ASTM F436M
Dimensions & Tolerances		ASTM F436M
Workmanship		ASTM F436M
Product Marking		ASTM F436M



F436M Washer Marking

ASTM A563M Nut finish weight - Kilos/100							
M12	M16	M20	M22	M24	M27	M30	M36
1.20	2.15	3.20	4.55	5.90	6.60	7.55	13.30
Weights are for guidance only and may vary in line with product tolerances							

F436M Washer Mechanical Properties				
Nominal Washer Size	Hardness (HRC)			
	Self Colour / Black		Hot Dip Galvanized	
	min	max	min	max
M16 to M36 inclusive	38	45	26	45

STRUCTURAL BOLTS

A490M - Heavy Hex Structural Bolts (Metric) Dimensions

Thread size d		M16	M20	M22	M24	M27	M30	M36
P pitch of thread		2	2.5	2.5	3	3	3.5	4
b	Bolt ≤ 100	31	36	38	41	44	49	56
	Bolt > 100	38	43	45	48	51	56	63
ds	min.	15.30	19.16	21.16	23.16	26.16	29.16	35.00
	max.	16.70	20.84	22.84	24.84	27.84	30.84	37.00
s	min.	26.16	33.00	35.00	40.00	45.00	49.00	58.80
	max.	27.00	34.00	36.00	41.00	46.00	50.00	60.00
e	min.	29.56	37.29	39.55	45.20	50.85	55.37	66.44
	max.	31.18	39.26	41.57	47.34	53.12	57.74	69.28
k	min.	9.25	11.60	13.10	14.10	16.10	17.65	21.45
	max.	10.75	13.40	14.90	15.90	17.90	19.75	23.55
k ¹	min.	6.5	8.1	9.2	9.9	11.3	12.4	15.0
dw ¹	min.	24.9	31.4	33.3	38.0	42.8	46.5	55.9
c	min.	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	max.	0.8	0.8	0.8	0.8	0.8	0.8	0.8
da	max.	18.2	22.4	24.4	26.4	30.4	33.4	39.4
r	min.	0.6	0.8	0.8	1.0	1.2	1.2	1.5
1) The maximum value of dw shall not exceed the actual width across flats								

Please refer to the drawing on page # 54

Materials

Medium carbon alloy steel in accordance with ASTM A490M

Characteristic		Standard
Materials & Manufacture		ASTM A490M
Finish	Self Colour / Black	ASTM A490M
Mechanical Properties		ASTM A490M
Dimensions & Tolerances		ASME B18.2.3.7M
Threads		ASME B1.13M tolerance class 6g
Workmanship		ASTM F788 / F788M
Magnetic Particle Inspection		ASTM A490M
Product Marking		ASTM A490M

A490M Bolt Length Tolerances for Bolt Diameters M16-M35 inc.	
Nominal Length	Length Tolerance
Up to and including 50	± 1.2
Over 50 up to and including 80	± 1.5
Over 80 up to and including 120	± 1.8
Over 120 up to and including 150	± 2.0
Over 150	± 4.0

All dimensions are in millimeters

STRUCTURAL BOLTS

A490M - Heavy Hex Structural Bolts (Metric)

Maximum Grip Gauging Length and Minimum Body Lengths

Nominal bolt dia. & thread pitch	M16 x 2		M20 x 2.5		M22 x 2.5		M24 x 3		M27 x 3		M30 x 3.5		M36 x 4	
I Nominal length	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min	lg max	ls min
45	14	8												
50	19	13	14	6.5										
55	24	18	19	11.5	17	9.5								
60	29	23	24	16.5	22	14.5	19	10						
65	34	28	29	21.5	27	19.5	24	15	21	12				
70	39	33	34	26.5	32	24.5	29	20	26	17	21	10.5		
75	44	38	39	31.5	37	29.5	34	25	31	22	26	15.5		
80	49	43	44	36.5	42	34.5	39	30	36	27	31	20.5	24	12
85	54	48	49	41.5	47	39.5	44	35	41	32	36	25.5	29	17
90	59	53	54	46.5	52	44.5	49	40	46	37	41	30.5	34	22
95	64	58	59	51.5	57	49.5	54	45	51	42	46	35.5	39	27
100	69	63	64	56.5	62	54.5	59	50	56	47	51	40.5	44	32
110	72	66	67	59.5	65	57.5	62	53	59	50	54	43.5	47	35
120	82	76	77	69.5	75	67.5	72	63	69	60	64	53.5	57	45
130	92	86	87	79.5	85	77.5	82	73	79	70	74	63.5	67	55
140	102	96	97	89.5	95	87.5	92	83	89	80	84	73.5	77	65
150	112	106	107	99.5	105	97.5	102	93	99	90	94	83.5	87	75
160	122	116	117	109.5	115	107.5	112	103	109	100	104	93.5	97	85
170	132	126	127	119.5	125	117.5	122	113	119	110	114	103.5	107	95
180	142	136	137	129.5	135	127.5	132	123	129	120	124	113.5	117	105
190	152	146	147	139.5	145	137.5	142	133	139	130	134	123.5	127	115
200	162	156	157	149.5	155	147.5	152	143	149	140	144	133.5	137	125
210	172	166	167	159.5	165	157.5	162	153	159	150	154	143.5	147	135
220	182	176	177	169.5	175	167.5	172	163	169	160	164	153.5	157	145
230	192	186	187	179.5	185	177.5	182	173	179	170	174	163.5	167	155
240	202	196	197	189.5	195	187.5	192	183	189	180	184	173.5	177	165
250	212	206	207	199.5	205	197.5	202	193	199	190	194	183.5	187	175
260	222	216	217	209.5	215	207.5	212	203	209	200	204	193.5	197	185
270	232	226	227	219.5	225	217.5	222	213	219	210	214	203.5	207	195
280	242	236	237	229.5	235	227.5	232	223	229	220	224	213.5	217	205
290	252	246	247	239.5	245	237.5	242	233	239	230	234	223.5	227	215
300	262	256	257	249.5	255	247.5	252	243	249	240	244	233.5	237	225

lg is grip gauging length; ls is body length

A490M Head Marking



A490M Bearing Surface Runout and Straightness		
Nominal bolt dia	Runout Bearing Surface max (mm)	Straightness max (mm/mm)
M16	0.48	0.006
M20	0.59	0.006
M22	0.63	0.006
M24	0.70	0.006
M27	0.77	0.006
M30	0.77	0.006
M36	1.01	0.006

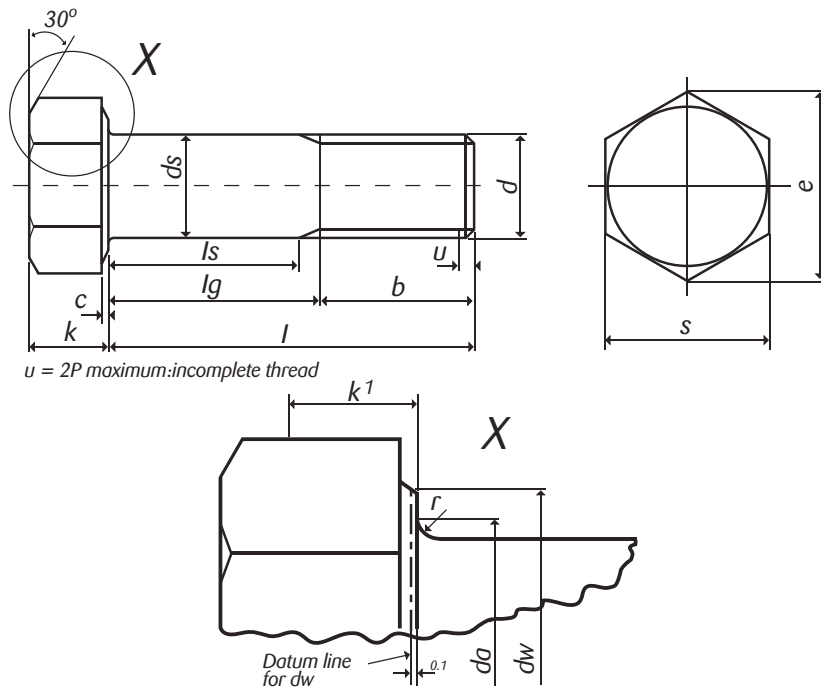
All dimensions are in millimeters

STRUCTURAL BOLTS

A490M - Heavy Hex Structural Bolts (Metric)

Tensile Load and Proof Load Requirements for Full-Size Bolts

Nominal Dia, & Thread Pitch	Stress Area	Tensile Load min		Proof Load #	Alternative Proof Load*	Hardness Rockwell HRC	
		Min (kN)	Max (kN)			min	max
M16 x 2	157	163	190	130	148	33	39
M20 x 2.5	245	255	296	203	230	33	39
M22 x 2.5	303	315	366	251	285	33	39
M24 x 3	353	367	427	293	332	33	39
M27 x 3	459	477	555	381	431	33	39
M30 x 3.5	561	583	679	466	527	33	39
M36 x 4	817	850	989	678	768	33	39
# Proof load determined by length measurement method							
* Alternative Proof load determined by yield strength method							



A490M Tensile Strength Requirements for Specimens Machined from Bolts					
Nominal Dia,	Tensile Strength		Yield Strength min	Elongation in 4D min	Reduction of Area min
	Min	Max			
	MPa	MPa	MPa	%	%
M16 to M36 inc	1040	1210	940	14	40

STRUCTURAL BOLTS

A490M - Heavy Hex Structural Bolts (Metric)
A490M Bolt Finish Weight - Kilos/100

Bolt Dia Bolt Length								
		M16	M20	M22	M24	M27	M30	M36
45		10.71						
50		11.38	18.85					
55		12.04	20.10	25.58				
60		12.70	21.40	26.85	33.76			
65		13.36	22.60	28.12	35.21	48.40		
70		14.02	23.87	29.39	36.66	50.64	60.66	
75		14.68	25.13	30.44	38.11	52.88	63.43	
80		15.34	26.40	31.93	39.56	55.12	66.21	124.50
85		16.00	27.69	33.20	41.01	57.36	68.98	128.50
90		16.66	28.90	34.47	42.46	59.60	71.76	132.50
95		17.32	30.15	35.74	43.91	61.84	74.53	135.40
100		17.98	31.50	37.01	45.36	64.08	77.30	141.30
110		19.55	34.00	39.99	48.91	68.57	82.84	149.29
120		21.13	36.44	42.97	52.46	73.06	88.39	157.28
130		22.71	38.95	45.96	56.01	77.56	93.94	165.27
140		24.29	41.50	48.94	59.56	82.05	99.49	173.26
150		25.87	44.00	51.93	63.11	86.55	105.04	181.25
160		27.44	46.50	54.91	66.66	91.04	110.59	189.24
170		29.02	49.02	57.89	70.21	95.54	116.15	197.23
180		30.60	51.53	60.88	73.77	100.03	121.69	205.22
190		32.18	54.40	63.86	77.32	104.53	127.23	213.21
200		33.76	56.60	66.85	80.87	109.02	132.78	221.20
210		35.34	59.10	69.83	84.42	113.52	138.32	229.19
220		36.91	61.70	72.81	87.97	118.01	143.87	237.18
230		38.49	64.11	75.80	91.52	122.50	149.42	245.17
240		40.07	66.65	78.78	95.07	127.00	154.97	253.16
250		41.65	69.20	81.77	98.62	131.49	160.52	261.15
260		43.23	71.70	84.75	102.18	135.99	166.07	269.14
270		44.81	74.20	87.73	105.73	140.48	171.62	277.13
280		46.38	76.70	90.72	109.28	144.98	177.17	285.12
290		47.96	79.25	93.70	112.83	149.47	182.71	293.11
300		49.54	81.90	96.69	116.38	153.97	188.26	301.10
Weights are for guidance only and may vary in line with product tolerances								

STRUCTURAL BOLTS

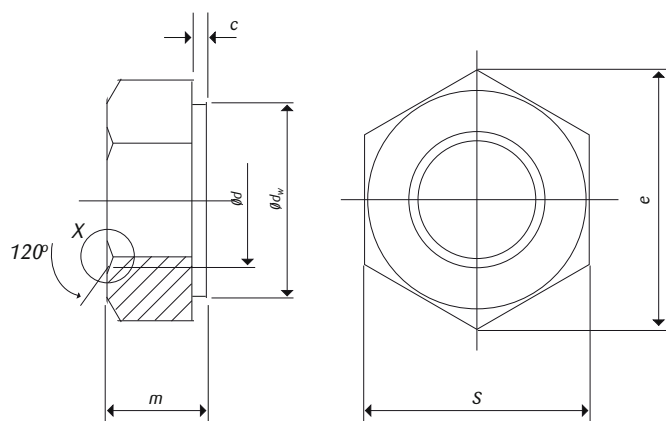
A325M - Heavy Hex Nuts (Metric) Nut Dimension

Nominal size and thread pitch d	s		e		m		dw ¹⁾	c		Total
	max	min	max	min	max	min	Bearing face diameter	max	min	runout of bearing surface
M16 x 2	27.00	26.16	31.18	29.56	17.1	16.4	24.9	0.8	0.4	0.47
M20 x 2.5	34.00	33.00	39.26	37.29	20.7	19.4	31.4	0.8	0.4	0.58
M22 x 2.5	36.00	35.00	41.57	39.55	23.6	22.3	33.3	0.8	0.4	0.63
M24 x 3	41.00	40.00	47.34	45.20	24.2	22.9	38.0	0.8	0.4	0.72
M27 x 3	46.00	45.00	53.12	50.85	27.6	26.3	42.8	0.8	0.4	0.80
M30 x 3.5	50.00	49.00	57.74	55.37	30.7	29.1	46.6	0.8	0.4	0.87
M36 x 4	60.00	58.80	69.28	66.44	36.6	35.0	55.9	0.8	0.4	1.05
¹⁾ The maximum dw shall not exceed the actual width across flats										

Materials

Carbon and carbon alloy steel in accordance with A563M class 10S

Characteristic		Standard
Materials & Manufacture		ASTM A563M Class 10S
Finish	Self Colour / Black	ASTM A563M
Mechanical Properties		ASTM A563M Class 10S
Dimensions & Tolerances		ANSI B18.2.4.6M
Threads		ASME B1.13M tolerance class 6H
Workmanship		ASTM F812 / F812M
Product Marking		ASTM A563M Class 10S



All dimensions are in millimeters

STRUCTURAL BOLTS

F436M Hardened Steel Washers (Matrix) - for use with ASTM A490M Bolts A490M Washer Dimensions

Nominal Washer Size		M16	M20	M22	M24	M27	M30	M36
d_1	max	18.4	22.5	24.5	26.5	30.5	33.6	39.6
	min	18.0	22.0	24.0	26.0	30.0	33.0	39.0
d_2	max	34.0	42.0	44.0	50.0	56.0	60.0	72.0
	min	32.4	40.4	42.4	48.4	54.1	58.1	70.1
h	max	4.6	4.6	4.6	4.6	4.6	4.6	4.6
	min	3.1	3.1	3.4	3.4	3.4	3.4	3.4

Materials

Carbon steel in accordance with F436M

Characteristic		Standard
Materials & Manufacture		ASTM F436M
Finish / Coatings	Self Colour / Black	ASTM F436M
Mechanical Properties		ASTM F436M
Dimensions & Tolerances		ASTM F436M
Workmanship		ASTM F436M
Product Marking		ASTM F436M

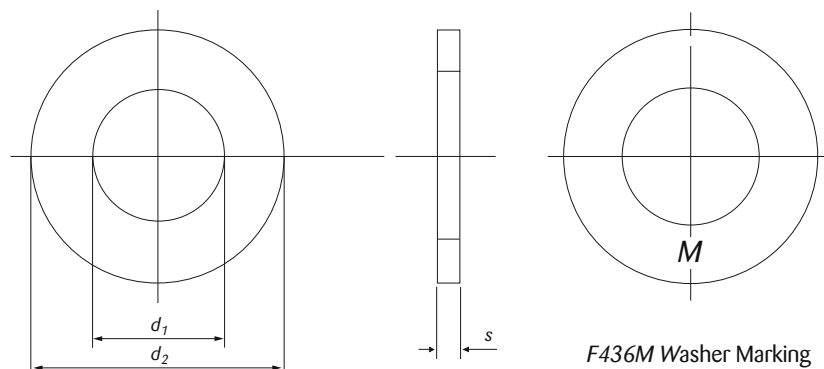
F436M Washer finish weight - Kilos/100

M12	M16	M20	M22	M24	M27	M30	M36
1.20	2.15	3.20	4.55	5.90	6.60	7.55	13.30

Weights are for guidance only and may vary in line with product tolerances

F436M Washer Mechanical Properties

Nominal Washer Size	Hardness (HRC)	
	Self Colour / Black	
	min	max
M16 to M36 inclusive	38	45

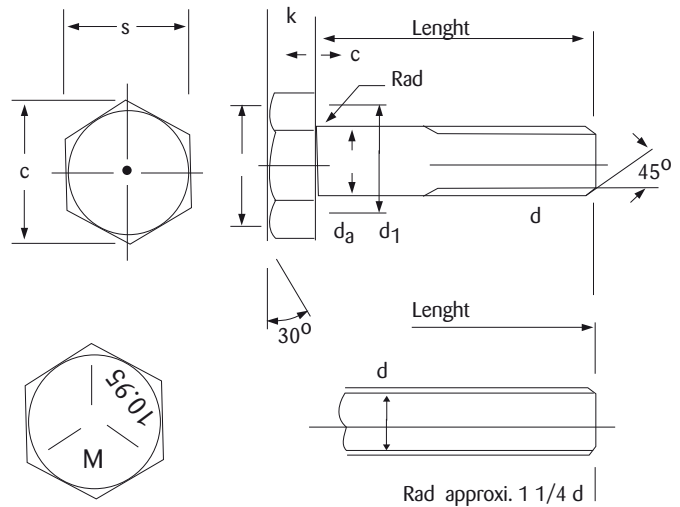


All dimensions are in millimeters

STRUCTURAL BOLTS

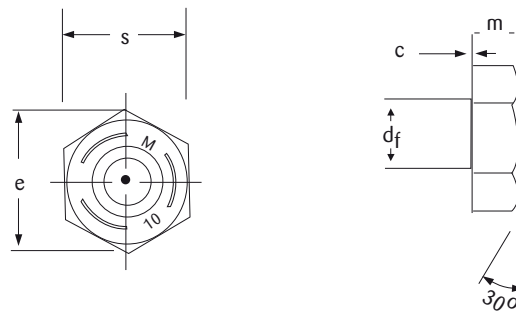
High Strength Friction Grip Bolts (10.9 Gr.)

Standard Specification : BS 4395 Part 2
Equivalent to DIN 6914, 6915
Material : Alloy Steel
Strength Grade : Class 10.9
Threads : 6H of BS 3643 Part 1 & 2
Surface Finish : Black, Hot Dipped Galvanized



DIMENSIONS BOLT

Nominal size and thread diameter d	Pitch of thread p	Diameter of unbreaded shank d		Width across flats S		Width across corner		Diameter of washer face d1		Depth of washer face c	Radius under head r		Transtion diameter d1	Thickness of head k	
	(Coarse pitch series)	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
M 12	1.75	12.70	11.30	22	21.16	21.16	23.70	22	19.91	0.4	1.00	0.6	14.7	8.45	7.55
M 16	2.0	16.70	15.30	27	25.16	31.2	29.30	27	24.91	0.4	1.00	0.6	18.7	10.45	9.55
M 20	2.5	20.84	19.16	32	31.00	34.9	35.03	32	20.75	0.4	1.20	0.8	23.24	13.90	12.10
M 22	2.5	22.84	21.16	36	35.00	41.6	30.55	36	33.75	0.4	1.20	0.8	25.24	14.90	13.10
M 24	3.0	24.84	23.16	41	40.00	47.3	45.20	41	38.75	0.5	1.20	0.8	27.24	15.90	14.10
M 27	3.0	27.84	26.16	46	45.00	53.1	50.85	46	43.75	0.5	1.50	1.0	30.84	17.90	16.10
M 30	3.5	30.84	29.16	50	49.00	57.7	56.37	50	47.75	0.5	1.50	1.0	33.84		17.95
M 36	4.0	37.00	35.00	60	58.80	69.3	66.44	60	57.75	0.5	1.50	1.0	40.00		21.95



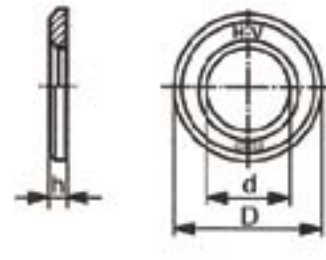
DIMENSIONS HSGG NUT

Nominal size and thread diameter d	Pitch of thread p	Width across flats S		Width across corner e		Diameter of washer face d1		Depth of washer face c	Thickness of nut m	
	(Coarse pitch series)	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Min.
M 12	1.75	22	21.6	25.40	23.70	22	19.91	0.4	11.55	10.45
M 16	2.0	27	26.16	31.20	29.30	27	24.91	0.4	15.55	11.45
M 20	2.5	32	31.00	35.90	35.03	32	29.75	0.4	18.55	17.45
M 22	2.5	36	35.00	41.00	39.55	36	33.75	0.4	19.65	13.35
M 24	3.0	41	40.00	47.30	45.20	41	38.75	0.5	22.65	21.35
M 27	3.0	46	45.00	53.10	50.85	46	43.75	0.5	24.65	23.35
M 30	3.5	50	49.00	57.70	55.37	50	47.75	0.5	26.85	25.35
M 36	4.0	60	58.80	69.30	66.44	60	57.75	0.5	31.80	30.20

STRUCTURAL BOLTS

Flat Washers, Steel - For high-strength structural bolting
Hardened 295-350 HV

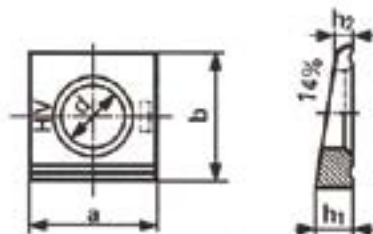
DIN 6916 / EN 14399-6



For Bolt (d)	d	D	h ±	Plain	Hot Dip Galvanized
M quantity			100	100	100
12	13	10	3	23.50	26.-
16	17	13	4	33.25	38.75
20	21	16	4	41.50	50.-
22	23	18	4	51.50	64.50
24	25	19	4	56.50	67.-
27	28	22	5	97.-	122.-
30	31	24	5	223.-	262.-
36	37	29	6	375.-	396.-

STRUCTURAL BOLTS

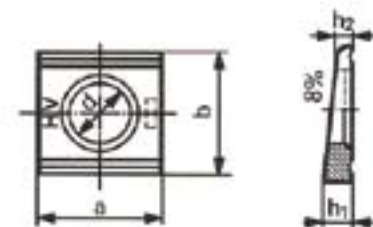
Square tapered washer, Steel - For high-strength structural bolting



DIN 6917

For T - Sections

bolts	d	a	b	h1	h2	Plain	Hot Dip Galvanized
M quantity						100	100
12	13	26	30	6,2	2	135.-	158.-
16	17	32	36	7,5	2,5	172.-	181.-
20	21	40	44	9,2	3	270.-	290.-
22	23	44	50	10	3	334.-	358.-
24	25	56	56	10,8	3	465.-	505.-
27	28	56	56	10,8	3	505.-	540.-
30	31	62	62	11,7	3	595.-	940.-



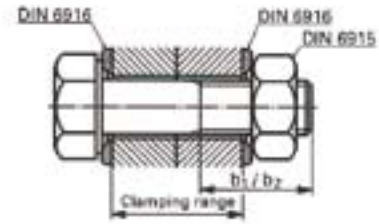
DIN 6918

For U - Sections

bolts	d	a	b	h1	h2	Plain	Hot Cip Galvanized
M quantity						100	100
12	13	26	30	4,9	2,5	194.-	155.-
16	17	32	36	5,9	3	177.-	196.-
20	21	40	44	7	3,5	238.-	252.-
22	23	44	50	8	4	310.-	332.-
24	25	56	56	8,5	4	450.-	460.-
27	28	56	56	8,5	4	485.-	480.-
30	31	62	62	9	4	840.-	885.-

STRUCTURAL BOLTS

Clamping Range of Heavy Hex Bolts HV



d	M 12	M 16	M 20	M 22	M 24	M 27	M 30	M 36
b1	21	26	31	32	34	37	40	48
b2	23	28	34	34	37	39	42	50
L	Clamping range							
30	6 to 10	10 to 14	10 to 14	14 to 18	22 to 26	28 to 32	29 to 33	31 to 35
35	11 to 15							
40	16 to 20	15 to 19	15 to 19	19 to 23	27 to 31	33 to 37	34 to 38	36 to 40
45	21 to 23							
50	24 to 28	20 to 24	20 to 24	24 to 28	32 to 36	38 to 42	39 to 43	41 to 45
55	29 to 33	25 to 29	25 to 29	29 to 33				
60	34 to 38	30 to 34	30 to 34	34 to 38	37 to 41	43 to 47	44 to 48	46 to 48
65	39 to 43	35 to 39	35 to 39	39 to 43				
70	44 to 48	40 to 44	40 to 44	44 to 48	42 to 46	48 to 52	49 to 53	49 to 53
75	49 to 53	45 to 47	45 to 49	49 to 53				
80	54 to 58	48 to 52	50 to 54	54 to 56	52 to 53	58 to 60	54 to 56	54 to 58
85	59 to 63	53 to 57	55 to 57	57 to 61				
90	64 to 68	58 to 62	58 to 62	62 to 66	64 to 68	61 to 65	62 to 66	59 to 63
95	69 to 73	63 to 67	63 to 67	67 to 71				
100		68 to 72	68 to 72	72 to 76	74 to 78	66 to 70	67 to 71	64 to 68
105		73 to 77	73 to 77	77 to 81				
110		78 to 82	78 to 82	82 to 86	84 to 88	68 to 72	72 to 76	69 to 73
115		83 to 87	83 to 87	87 to 91				
120		89 to 92	88 to 92	92 to 96	94 to 98	71 to 75	78 to 82	74 to 78
125		93 to 97	93 to 97	97 to 101				
130		98 to 102	98 to 102	102 to 106	104 to 108	76 to 80	82 to 86	79 to 83
135			103 to 107	107 to 111				
140			108 to 112	112 to 116	114 to 118	77 to 81	78 to 82	84 to 88
145			113 to 117	117 to 121				
150			118 to 122	122 to 127	124 to 128	81 to 85	82 to 86	89 to 93
155				128 to 131				
160					129 to 133	86 to 90	107 to 111	94 to 98
165								
170					139 to 143	88 to 92	113 to 117	104 to 108
175								
180					149 to 153	70 to 74	118 to 122	109 to 113
185								
190						131 to 135	127 to 131	114 to 118
195								
200						136 to 140	137 to 141	124 to 128
						146 to 150	142 to 146	134 to 138
						156 to 160	152 to 156	144 to 148



SPECIAL ANCHOR BOLTS

SPECIAL ANCHOR BOLTS



SPECIAL ANCHOR BOLTS

Anchor Material Specification	Sizes	Profile	Thread Profile	Nut Material Specification	Coating Type
ASTM A307, Grade A	1/2" thru 1-1/2" over 1-1/2"	Hex Bolt Heavy Hex Bolt	ASME B18.2.1, UNC	ASTM A563, Gr. A Heavy Hex	Galvanized to ASTM A153, Class C or ASTM B695, Class 50
ASTM A36/A36M	1/2" thru 3" M12 thru M72	Rod	ASME B1.1, UNC, Class 2 ASME B1.13M	ASTM A563, Gr. A Heavy Hex	Galvanized to ASTM A153, Class C or ASTM B695, Class 50
ASTM F1554, Gr. 36	1/2" thru 3"	Rod	ASME B1.1, UNC, Class 2	ASTM A563, Gr. A Heavy Hex	Galvanized to ASTM A153, Class C or ASTM B695, Class 50
ASTM A193/A193M, Gr. B7	3/4" thru 3" M20 thru M72	Bolts/Rods	ASME B1.1, 8 UN, Class 2 ASME B1.13M	ASTM A563, 0H Heavy Hex or ASTM A194/A 194M	Painted per APCS-IC or APCS-IF per SAES-H-001
ASTM F1554 Gr. 105	3/4" thru 3" M20 thru M72	Rod	ASME B1.1, 8 UN, Class 2	ASTM A563, 0H Heavy Hex or ASTM A194/A 194M	Galvanized to ASTM A153, Class C or ASTM B695, Class 50

FORMAT FOR ANCHOR BOLT CALL OUT ON DRAWINGS

ANCHOR BOLT TYPE
BOLT DIAMETER (d_b)

AB 3S-1-1/2"-100-600-(2) NUMBER OF NUTS

BOLT LENGTH (L)
PROJECTION

INCH SIZES

ANCHOR BOLT TYPE
BOLT DIAMETER (d_b)

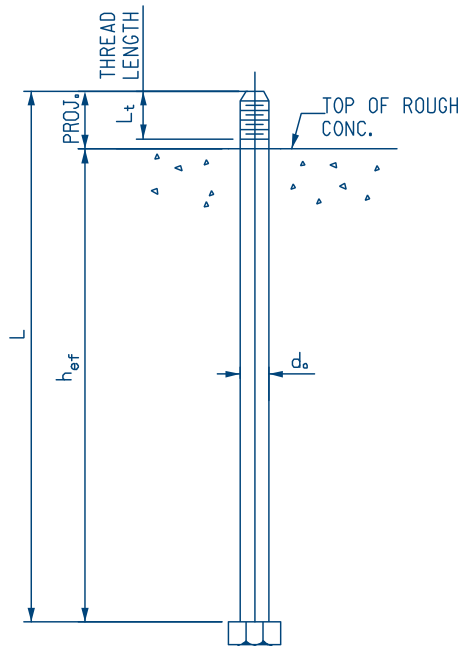
AB 3S-M24-100-600-(2) NUMBER OF NUTS

BOLT LENGTH (L)
PROJECTION

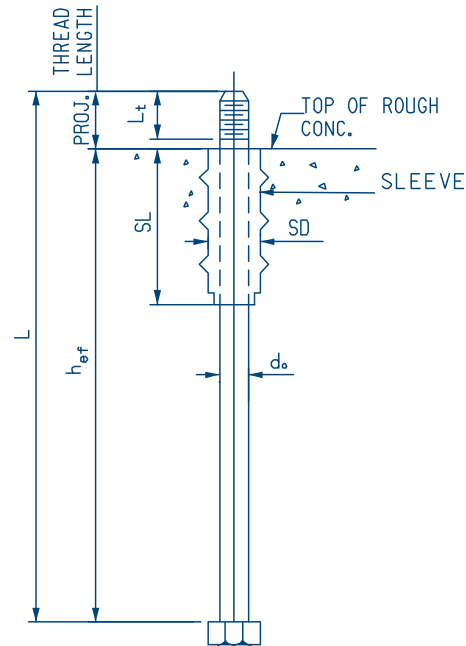
METRIC SIZES



SPECIAL ANCHOR BOLTS



TYPE I
ASTM A307



TYPE IS
ASTM A307

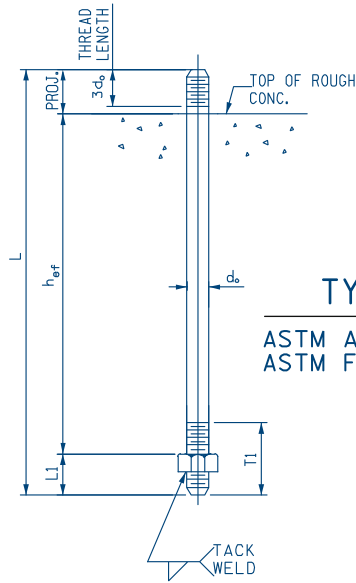
Table 1- ASTM A307, Grade A Bolt Sizes-Inch Series

Bolt Properties						Type I				Type IS					
Size d_o	Type	L_t	TPI	Stress Area (in^2)	Max. Proj. (note c)	h_{ef} min. $12d_o$	Length (L) Proj.+ h_{ef}	Edge Dist. $4d_o \geq 100+d_o/2$	Spacing $6d_o$	h_{ef} min. $SL+150$	Length (L) Proj.+ h_{ef}	Edge Dist. (note d)	Spacing (note e)	Sleeve	
(in)		(in)			(mm)	(mm)	(in)	(mm)	(mm)	(mm)	(in)	(mm)	(mm)	SD	SL
1/2	Hex	1.50	13	0.142	107	152	10	108	76	275	15	127	114	50	125
5/8	Hex	1.75	11	0.226	115	191	12	110	95	325	17 1/2	127	129	50	175
3/4	Hex	2.00	10	0.334	123	229	14	111	114	325	17 1/2	127	145	50	175
7/8	Hex	2.25	9	0.462	131	267	15 1/2	113	133	325	18	127	161	50	175
1	Hex	2.50	8	0.606	139	305	17 1/2	114	152	400	21	139	202	75	250
1-1/8	Hex	2.75	7	0.763	146	343	19 1/2	116	171	421	22 1/2	139	218	75	250
1-1/4	Hex	3.00	7	0.969	154	381	21	127	191	441	23 1/2	149	234	75	250
1-3/8	Hex	3.25	6	1.155	162	419	23	140	210	460	24 1/2	160	250	75	250
1-1/2	Hex	3.50	6	1.405	170	457	24 1/2	152	229	604	30 1/2	183	291	100	375
1-3/4	Heavy Hex	4.00	5	1.899	186	533	28 1/2	178	267	642	32 1/2	206	322	100	375
2	Heavy Hex	4.50	4.5	2.498	202	610	32	203	305	755	37 1/2	228	354	100	450
2-1/4	Heavy Hex	5.00	4.5	3.248	218	686	35 1/2	229	343	793	40	250	386	100	450
2-1/2	Heavy Hex	5.50	4	3.999	234	762	39	254	381	981	48	297	468	150	600
2-3/4	Heavy Hex	6.00	4	4.934	250	838	43	279	419	1019	50	319	499	150	600
3	Heavy Hex	6.50	4	5.967	266	914	46 1/2	305	457	1057	52	342	531	150	600

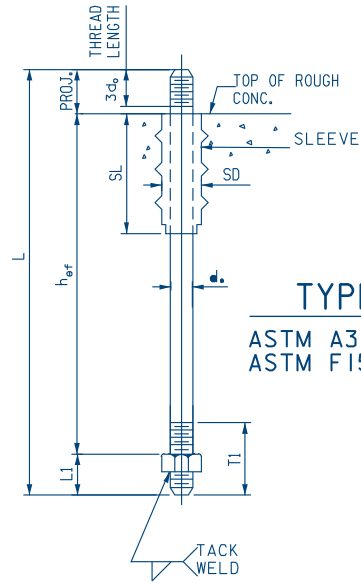
NOTE:

- A. MINIMUM EDGE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE ANCHOR BOLT TO THE EDGE OF THE CONCRETE.
- B. ASTM A307 BOLT LENGTHS MAY NOT BE AVAILABLE FOR THE LARGER DIAMETER TYPE IS BOLT.
- C. IF THE REQUIRED PROJECTION EXCEED THE MAXIMUM PROJECTION IN THE TABLE ABOVE, USE A TYPE 2 ANCHOR BOLT.
- D. EDGE DISTANCE FOR BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D.) / 2
- E. SPACING OF BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D.)
- F. TPI= THREADS PER INCH

SPECIAL ANCHOR BOLTS



TYPE 2
ASTM A36/A36M or
ASTM F1554, Gr. 36



TYPE 2S
ASTM A36/A36M or
ASTM F1554, Gr. 36

Table 2 - ASTM A36, ASTM F1554 Grade 36 Anchor Rods-Inch Series

Bolt Properties					Type 2			Type 2S				
Size	TPI	Stress	L1	T1	h_{eff} min.	Edge Dist.	Spacing	h_{eff} min.	Edge Dist.	Spacing	Sleeve	
d_b		Area	d_b+13	$2d_b$	$12d_b$	$4d_b \geq 100+d_b/2$	$6d_b$	SL+150	(note b)	(note c)	SD	SL
(in)		(in ²)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
1/2	13	0.142	26	25	152	108	76	275	127	114	50	125
5/8	11	0.226	29	32	191	110	95	325	127	129	50	175
3/4	10	0.334	32	38	229	111	114	325	127	145	50	175
7/8	9	0.462	35	44	267	113	133	325	127	161	50	175
1	8	0.606	38	51	305	114	152	400	139	202	75	250
1-1/8	7	0.763	42	57	343	116	171	421	139	218	75	250
1-1/4	7	0.969	45	64	381	127	191	441	149	234	75	250
1-3/8	6	1.155	48	70	419	140	210	460	160	250	75	250
1-1/2	6	1.405	51	76	457	152	229	604	183	291	100	375
1-3/4	5	1.899	57	89	533	178	267	642	206	322	100	375
2	4.5	2.498	64	102	610	203	305	755	228	354	100	450
2-1/4	4.5	3.248	70	114	686	229	343	793	250	386	100	450
2-1/2	4.0	3.999	77	127	762	254	381	981	297	468	150	600
2-3/4	4.0	4.934	83	140	838	279	419	1019	319	499	150	600
3	4.0	5.967	89	152	914	305	457	1057	342	531	150	600

NOTE:

- A. MINIMUM EDGE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE ANCHOR BOLT TO THE EDGE OF THE CONCRETE.
 B. EDGE DISTANCE FOR BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D)/2
 C. SPACING OF BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D)
 D. TPI= THREADS PER INCH

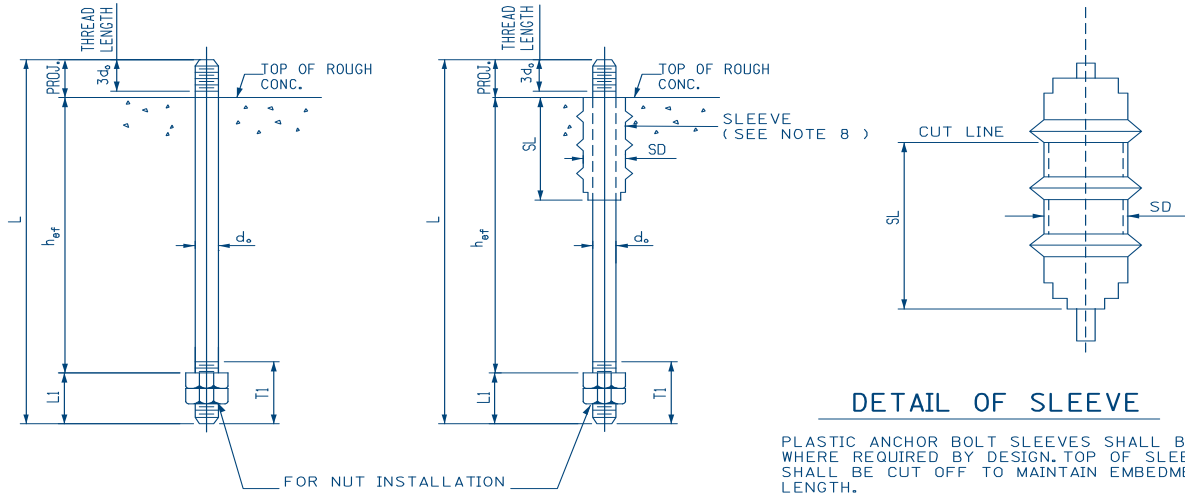
Table 2M - ASTM A36 Anchor Rods - Metric

Bolt Properties				Type 2			Type 2S				
Nominal Dia. (d_o) & thread pitch	Stress Area	L1	T1	h_{eff} min.	Edge Dist.	Spacing	h_{eff} min.	Edge Dist.	Spacing	Sleeve	
(mm)	(mm ²)	$d_o + 13$	$2d_o$	$12d_o$	$4d_o \geq 100 + d_o/2$	$6d_o$	$SL + 150$	(note b)	(note c)	SD	SL
M12x1.75	84.3	25	24	144	106	72	275	125	110	50	125
M16x2	157	29	32	192	108	96	275	125	130	50	125
M20x2.5	245	33	40	240	110	120	325	125	150	50	175
M24x3	353	37	48	288	112	144	400	138	195	75	250
M27x3	459	40	54	324	114	162	400	138	210	75	250
M30x3.5	561	43	60	360	120	180	400	143	225	75	250
M36x4	817	49	72	432	144	216	525	176	280	100	375
M42x4.5	1120	55	84	504	168	252	525	197	310	100	375
M48x5	1470	61	96	576	192	288	600	218	340	100	450
M56x5.5	2030	69	112	672	224	336	672	246	380	100	450
M64x6	2680	77	128	768	256	384	768	299	470	150	600
M72x6	3460	85	144	864	288	432	864	327	510	150	600

NOTE:

- A. MINIMUM EDGE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE ANCHOR BOLT TO THE EDGE OF THE CONCRETE.
 B. EDGE DISTANCE FOR BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D)/2
 C. SPACING OF BOLTS WITH SLEEVES MUST BE INCREASED BY (SD-D)

SPECIAL ANCHOR BOLTS



TYPE 3

ASTM A193/A193M or
ASTM F1554, Gr. 105

TYPE 3S

ASTM A193/A193M or
ASTM F1554, Gr. 105

Table 3 - ASTM A193, ASTM F1554 Grade 105 Anchor Rods-Inch Series

Bolt Properties					Type 3			Type 3S				
Size	TPI	Stress	LI	TI	h_{ef} min.	Edge Dist.	Spacing	h_{ef} min.	Edge Dist.	Spacing	Sleeve	
d_o		Area (in ²)	$2d_o+13$	$3d_o$	$12d_o$	$6d_o \geq 100+d_o/2$	$6d_o$	SL+150	(note b)	(note c)	SD	SL
(in)			(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
$\frac{3}{4}$	10	0.334	51	57	229	114	114	325	130	145	50	175
$\frac{7}{8}$	9	0.462	57	67	267	133	133	325	147	161	50	175
1	8	0.606	64	76	305	152	152	400	177	202	75	250
1-1/8	8	0.790	70	86	343	171	171	421	195	218	75	250
1-1/4	8	1.000	77	95	381	191	191	441	212	234	75	250
1-3/8	8	1.234	83	105	419	210	210	460	230	250	75	250
1-1/2	8	1.492	89	114	457	229	229	604	260	291	100	375
1-3/4	8	2.082	102	133	533	267	267	642	294	322	100	375
2-1/4	8	3.557	127	171	686	343	343	793	364	386	100	450
2-1/2	8	4.442	140	191	762	381	381	981	424	468	150	600
2-3/4	8	5.425	153	210	838	419	419	1019	459	499	150	600
3	8	6.506	165	229	914	457	457	1057	494	531	150	600

NOTE:

A. MINIMUM EDGE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE ANCHOR BOLT TO THE EDGE OF THE CONCRETE.

B. EDGE DISTANCE FOR BOLTS WITH SLEEVES MUST BE INCREASED BY $(SD-D)/2$

C. SPACING OF BOLTS WITH SLEEVES MUST BE INCREASED BY $(SD-D)$

D. TPI= THREADS PER INCH

Table 3M - ASTM A193M Anchor Rods - Metric

Bolt Properties				Type 3			Type 3S				
Nominal Dia. (d_o) & thread pitch	Stress Area	LI	TI	h_{ef} min.	Edge Dist.	Spacing	h_{ef} min.	Edge Dist.	Spacing	Sleeve	
(mm)	(mm^2)	$2d_o + 13$	$3d_o$	$12d_o$	$6d_o \geq 100 + d_o/2$	$6d_o$	$SL + 150$	(note b)	(note c)	SD	SL
M12x1.75	84.3	37	36	144	106	72	275	125	110	50	125
M16x2	157	45	48	192	108	96	275	125	130	50	125
M20x2.5	245	53	60	240	120	120	325	135	150	50	175
M24x3	353	61	72	288	144	144	400	170	195	75	250
M27x3	459	67	81	324	162	162	400	186	210	75	250
M30x3.5	561	73	90	360	180	180	400	203	225	75	250
M36x4	817	85	108	432	216	216	525	248	280	100	375
M42x4.5	1120	97	126	504	252	252	525	281	310	100	375
M48x5	1470	109	144	576	288	288	600	314	340	100	450
M56x5.5	2030	125	168	672	336	336	672	358	380	100	450
M64x6	2680	141	192	768	384	384	768	427	470	150	600
M72x6	3460	157	216	864	432	432	864	471	510	150	600

NOTE:

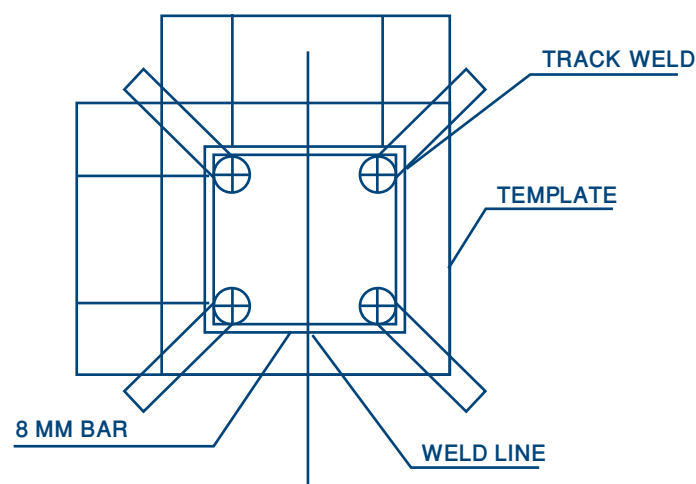
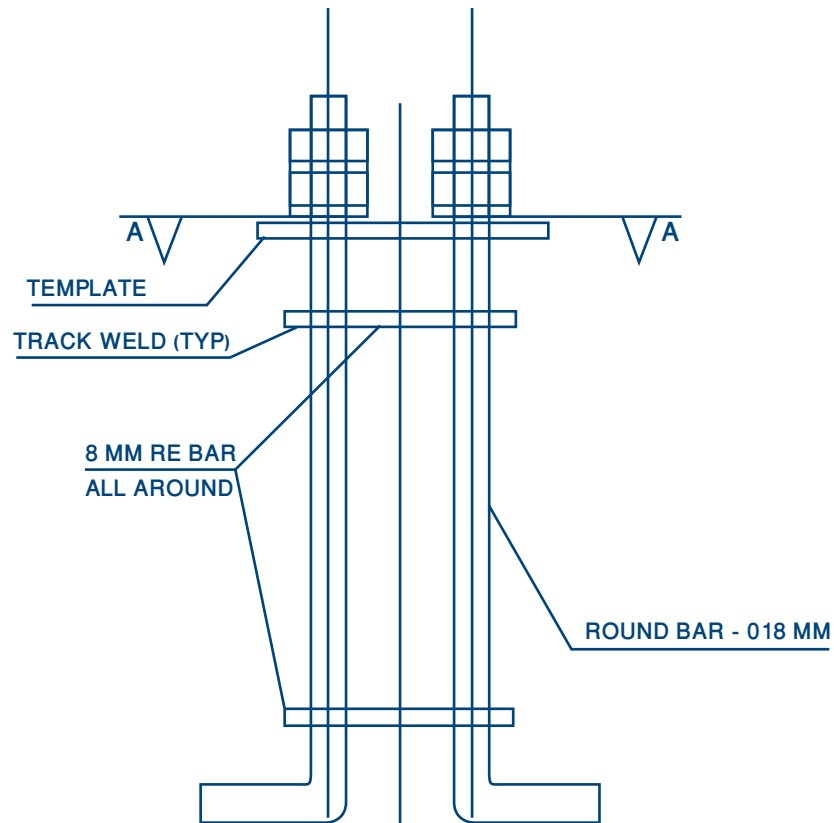
A. MINIMUM EDGE DISTANCE IS MEASURED FROM THE CENTERLINE OF THE ANCHOR BOLT TO THE EDGE OF THE CONCRETE.

B. EDGE DISTANCE FOR BOLTS WITH SLEEVES MUST BE INCREASED BY $(SD-D)/2$

C. SPACING OF BOLTS WITH SLEEVES MUST BE INCREASED BY $(SD-D)$

SPECIAL ANCHOR BOLTS

DETAIL OF TEMPLATE & GAUGE RINGS
FOR M18X350 ANCHOR BOLTS, TYPE 1



SECTION A-A

SPECIAL ANCHOR BOLTS

FIGURE 3

STANDARD ANCHOR BOLTS AND SLEEVES - BOLT DATA TABLE

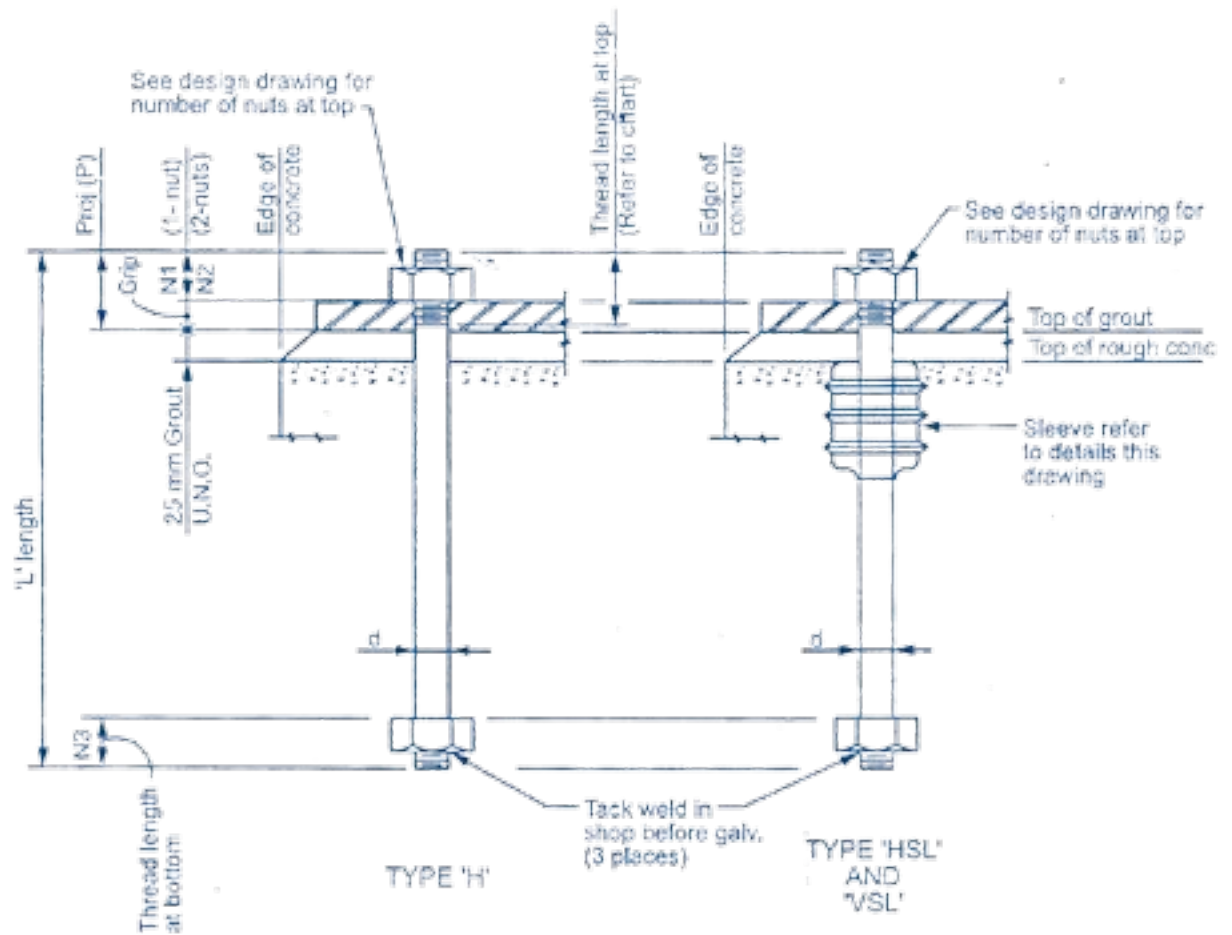
STANDARD 'H', 'HSL' AND 'VSL' ANCHOR BOLT DATA TABLE								
BOLT DIA d	ALLOWANCE FOR NUTS			(THREAD LENGTH AT TOP)	SHELL SIZE	STRUCTURES AND EQUIPMENT 'H' AND 'HSL' BOLTS	VERTICAL VESSELS ONLY VSL' BOLTS	BOLT DIA d
	N1	N2	N3 (THREAD LENGTH AT BOTTOM)		SHELL SIZE	STANDARD LENGTH L	STANDARD LENGTH L	
12	20	35	25	60	50x130	360	610	12
16	25	45	25	70	50x180	410	690	16
20	35	50	35	80	50x180	460	740	20
22	35	60	35	85	50x180	510	870	22
25	40	65	40	90	75x250	590	1040	25
32	50	85	45	110	75x250	660	1120	32
38	60	95	50	120	100x380	790	1400	38
45	70	115	60	140	100x380	870	1480	45
50	80	130	65	155	100x450	990	1810	50
57	90	150	70	175	100x450	1040	1880	57
64	95	85	80	185	Sheet metal sleeve, see sheet 3	1100	1930	64
70	110	180	85	205	Sheet metal sleeve, see sheet 3	1170	2010	70
75	115	190	90	220	Sheet metal sleeve, see sheet 3	1250	2240	75

All dimensions are in mm unless noted otherwise.

SPECIAL ANCHOR BOLTS

FIGURE 1

STANDARD ANCHOR BOLTS AND SLEEVES - BOLT DATA TABLE

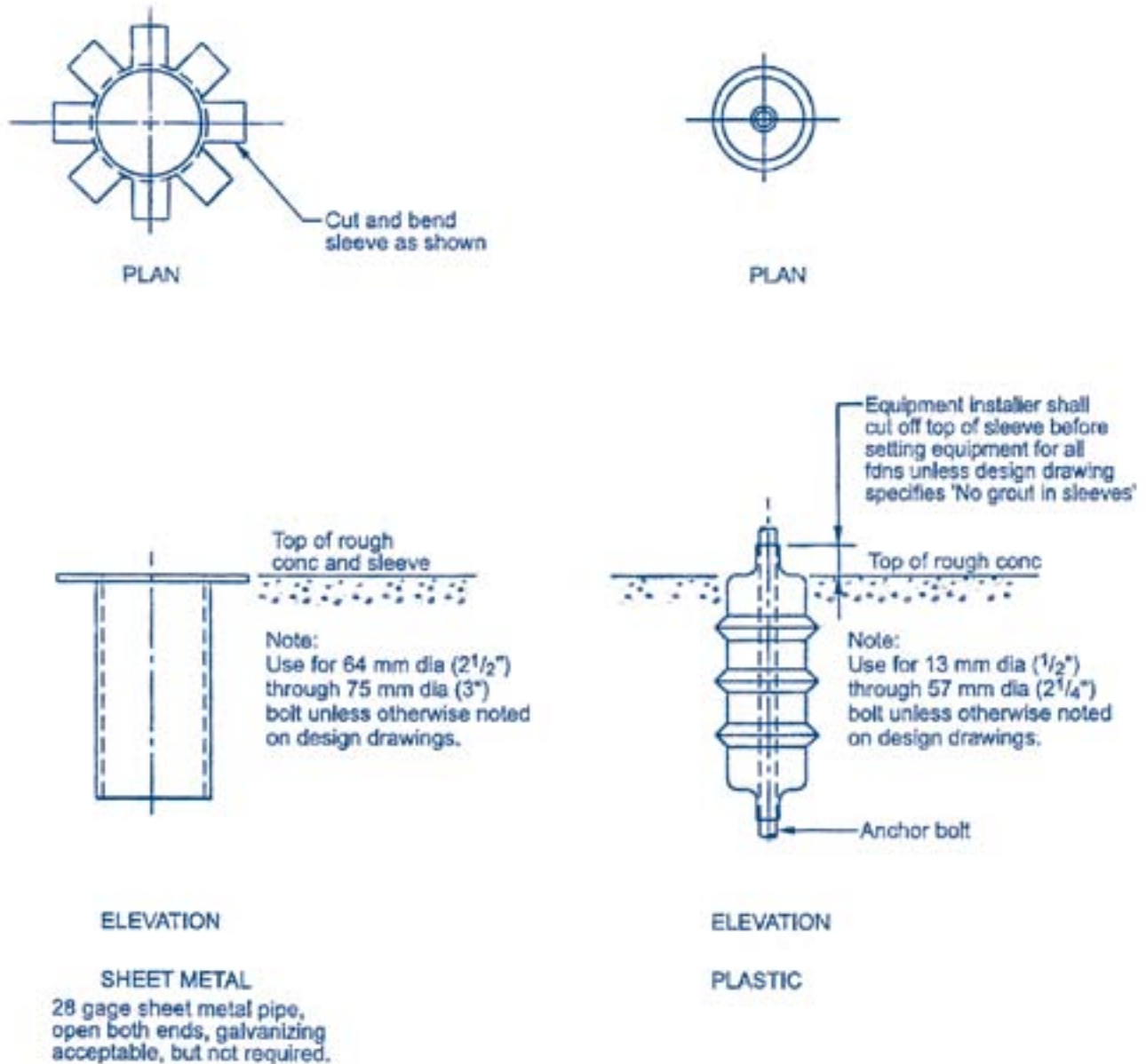


BOLT DETAILS

SPECIAL ANCHOR BOLTS

FIGURE 1

STANDARD ANCHOR BOLTS AND SLEEVES - BOLT DATA TABLE



SLEEVE DETAILS

SPECIAL ANCHOR BOLTS

STANDARD ANCHOR BOLTS AND SLEEVES - BOLT DATA TABLE

- (1) Anchor bolt assembly material shall to SES B55-S01 except as otherwise specified on design drawing.
- (2) Leveling nuts on anchor bolts shall not be used unless otherwise noted on the design drawings.
- (3) Plastic sleeves shall be Wilson anchor bolt sleeves as manufactured by Sinco Products. Inc., or SABIC approved equal.
- (4) Headed bolts of at least the same length above the bottom nut are an acceptable substitution.
- (5) Unless otherwise specified, all bolts and nuts shall be hot dipped galvanized after fabrication.
- (6) Excess galvanizing material shall be removed from the thread portions of the bolts by the use of a centrifuge or by mechanical chasing of the bolt thread.
- (7) Fit of nuts on threads of anchor bolts shall be verified before shipment.
- (8) Type "H" bolt assembly shall consist of anchor bolt with tack welded nuts at top as specified unless noted otherwise. Type "HSL" and "VSL" bolt assemblies shall consist of anchor bolt with tack welded nut at bottom, sleeve and nuts at top as specified unless noted otherwise. Type "HSL" is recommended for equipment where as type "VSL" is recommended for vertical vessels only.
- (9) Sample anchor bolt callout.

	8	32Ø	X	950	HSL	P=95	W/2 NUTS
quantity	_____						
Diameter	_____						
Bolt length	_____						
Type	_____						
Projection from top of grout	_____						
Nut quantity	_____						

- (10) Unless noted otherwise, tolerance will be as follows:
 - a. Bolt projection +6 mm, -0 mm
 - b. Center to center of any 2 bolts within a bolt group 3 mm (such as an equipment foundation or base plate)
 - c. Center to center between bolt groups 6 mm (such as a series of columns)
 - d. Plumpness 3 mm IN 900 mm
- (11) Sleeves shall be filled with grout after anchor bolts are aligned unless noted otherwise on design drawings.
- (12) Anchor bolts shall be tightened to snug condition except where torque value is specified on the design drawings, or at the locations of slide plates.



HIGH TENSILE STUD BOLTS

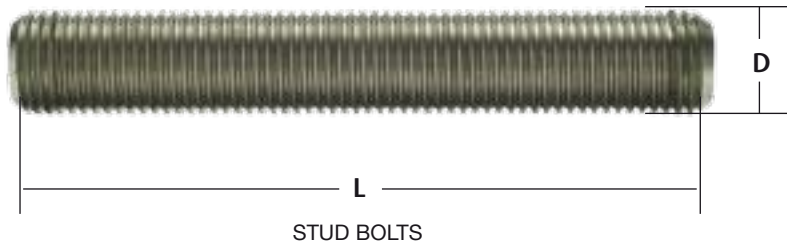
HIGH TENSILE STUD BOLTS



HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts

STUD BOLTS SIZE AND DIMENSION TOLERANCE



LENGTH

INCH SERIES

The length of the stud bolt, measured parallel to the axis, is the distance from first thread to first thread. First thread is defined as the intersection of the major diameter of the thread with the base of the point.

METRIC SERIES

The length of the stud bolt, measured parallel to the axis, is the distance from each stud bolt, including the end point.

Length inch	Length inch	Tolerance mm
to 12	$\pm 0,062$	$\pm 1,5748$
over 12 to 18	$\pm 0,125$	$\pm 3,175$
over 18	$\pm 0,250$	$\pm 6,35$

THREADS

Nominal size or diameter INCH SERIES	1" and smaller UNIFIED COARSE THREAD SERIES CLASS 2A ASME B1.1	1 1/8" and larger UNIFIED 8 THREAD SERIES CLASS 2A ASME B1.1
Nominal size or diameter METRIC SERIES	M33 and smaller METRIC COARSE THREAD SERIES CLASS 6g ISO 68 / ISO 965	M36 and larger METRIC FINE AND COARSE PITCH THREADS CLASS 6g ISO 68 / ISO 965

MARKING

Marking are in accordance with the applicable ASTM & DIN-ISO specification.

HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts Mechanical Requirements



ALLOY AND STAINLESS STEEL ASTM A193 FOR HIGH TEMPERATURE SERVICE

ALLOY	ASTM	AISI	UNS	W.-Nr.	Dia	Tensile Strength min, MPa	Yield Strength min, 0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %	HB
B5	A193	501	S50100	1.7362	up to 4, incl	690	550	16	50	-
B6	A193	410	S41000	1.4006	up to 4, incl	760	585	15	50	-
B7	A193	4140	G41400	1.7225	2 1/2 and under	860	720	16	50	<321
					over 2 1/2 to 4	795	655	16	50	<302
					over 4 to 7	690	515	18	50	<277
B7M	A193	4140	G41400	1.7225	2 1/2 and under	690	550	18	50	<235
					over 2 1/2 to 4	690	550	18	50	<235
					over 4 to 7	690	515	18	50	<235
B16	A193	-	K14072	1.7711	2 1/2 and under	860	725	18	50	<321
					over 2 1/2 to 4	760	655	17	45	<302
					over 4 to 7	690	585	16	45	<277
B8	A193	304	S30400	1.4301	all size	515	205	30	50	<223
B8A	A193	304	S30400	1.4301	all size	515	205	30	50	<192
B8T	A193	321	S32100	1.4541	all size	515	205	30	50	<223
B8TA	A193	321	S32100	1.4541	all size	515	205	30	50	<192
B8C	A193	347	S34700	1.4550	all size	515	205	30	50	<223
B8CA	A193	347	S34700	1.4550	all size	515	205	30	50	<192
B8M	A193	316	S31600	1.4401	all size	515	205	30	50	<223
B8MA	A193	316	S31600	1.4401	all size	515	205	30	50	<192
B8cl2	A193	304	S30400	1.4301	3/4 and under	860	690	12	35	<321
B8Tcl2	A193	321	S32100	1.4541	over 3/4 to 1	795	550	15	35	<321
B8Ccl2	A193	347	S34700	1.4550	over 1 to 1 1/4	725	450	20	35	<321
					over 1 1/4 to 1 1/2	690	345	28	45	<321
B8Mcl2	A193	316	S31600	1.4401	3/4 and under	760	665	15	45	<321
					over 3/4 to 1	690	550	20	45	<321
					over 1 to 1 1/4	655	450	25	45	<321
					over 1 1/4 to 1 1/2	620	345	30	45	<321
B8Mcl2B	A193	316	S31600	1.4401	2 and under	655	515	25	40	<321
					over 2 to 2 1/2	620	450	30	40	<321
					over 2 1/2 to 3	550	380	30	40	<321
B8Mcl2C	A193	316	S31600	1.4401	2 and under	585	450	30	60	<321
					over 2	585	415	30	60	<321

ALLOY AND STAINLESS STEEL ASTM A320 FOR LOW TEMPERATURE SERVICE

ALLOY	ASTM	AISI	UNS	W.-Nr.	Dia	Tensile Strength min, MPa	Yield Strength min, 0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %	HB	Impact test -101°C aver.(min) Joules	Impact test -73°C aver.(min) Joules
L7	A 320	4140	G41400	1.7225	2 1/2 and under	860	725	16	50		27 (20)	
L7M	A 320	4140	G41400	1.7225	all size	690	550	18	50	<235		27 (20)
L43	A 320	4340	G43400	1.6565	4 and under	860	725	16	50		27 (20)	
B8	A 320	304	S30400	1.4301	all size	515	205	35	50	<223		
B8A	A 320	304	S30400	1.4301	all size	515	205	35	50	<192		
B8T	A 320	321	S32100	1.4541	all size	515	205	35	50	<223		
B8TA	A 320	321	S32100	1.4541	all size	515	205	35	50	<192		
B8C	A 320	347	S34700	1.4550	all size	515	205	35	50	<223		
B8ACA	A 320	347	S34700	1.4550	all size	515	205	35	50	<192		
B8M	A 320	316	S31600	1.4401	all size	515	205	35	50	<223		
B8MA	A 320	316	S31600	1.4401	all size	515	205	35	50	<192		
B8cl2	A 320	304	S30400	1.4301	3/4 and under	860	690	12	35	<321		
B8Tcl2	A 320	321	S32100	1.4541	over 3/4 to 1	725	450	20	35	<321		
B8Ccl2	A 320	347	S34700	1.4550	over 1 to 1 1/4	795	550	15	35	<321		
					over 1 1/4 to 1 1/2	690	345	28	45	<321		
B8Mcl2	A 320	316	S31600	1.4401	3/4 and under	760	655	15	45	<321		
					over 3/4 to 1	690	550	20	45	<321		
					over 1 to 1 1/4	655	450	25	45	<321		
					over 1 1/4 to 1 1/2	620	345	30	45	<321		

HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts CHEMICAL REQUIREMENTS



(COMPOSITION, percent)												
ALLOY	C	Mn max	P max	S max	Si max	Cr	Ni	Mo	V	Ti	Al max	Cb+Ta
B5	0,10 min	1,00	0,04	0,03	1,00	4,00-6,00	-	0,40-0,65	-	-	-	-
B6	0,15 min	1,00	0,04	0,03	1,00	11,5-13,5	-	-	-	-	-	-
B7	0,37-0,49	0,65-1,10	0,04	0,04	0,15-0,35	0,75-1,20	-	0,15-0,25	-	-	-	-
B7M	0,37-0,49	0,65-1,10	0,04	0,04	0,15-0,35	0,75-1,20	-	0,15-0,25	-	-	-	-
B16	0,36-0,47	0,45-0,70	0,04	0,04	0,15-0,35	0,80-1,15	-	0,50-0,65	0,25-0,35	-	0,015	-
B8	0,08 max	2,00	0,05	0,03	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8A	0,08 max	2,00	0,05	0,03	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8C	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	-	-	10xC min
B8CA	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	-	-	10xC min
B8M	0,08 max	2,00	0,05	0,03	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8MA	0,08 max	2,00	0,05	0,03	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8T	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	5xC min	-	-
B8TA	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	5xC min	-	-
B8cl2	0,08 max	2,00	0,05	0,03	1,00	18,0-20,0	8,0-11,0	-	-	-	-	-
B8Ccl2	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	-	-	10xC min
B8Mcl2	0,08 max	2,00	0,05	0,03	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
B8Tcl2	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	5xC min	-	-
L7	0,38-0,48	0,75-1,00	0,04	0,04	0,15-0,35	0,80-1,10	-	0,15-0,25	-	-	-	-
L7M	0,38-0,48	0,75-1,00	0,04	0,04	0,15-0,35	0,80-1,10	-	0,15-0,25	-	-	-	-
L43	0,38-0,43	0,60-0,85	0,04	0,04	0,15-0,35	0,70-0,90	1,65-2,00	2,0-3,0	-	-	-	-

CARBON, ALLOY AND STAINLESS STEEL NUTS ASTM A 194

ALLOY	ASTM	AISI	UNS	W.-Nr.	Dia	HB	HRC	HRB
2	A 194	1040	K04002	1.1191	all size	159 to 327		
2H	A 194	1040	K04002	1.1191	11/2 and under	248 to 327	24 to 28	
2HM	A 194	1040	K04002	1.1191	over 11/2	212 to 327	38 max	95 min
4L	A 194	-	K14510	-	all size	159 to 237	22 max	
					all size	248 to 327	24 to 38	
3	A 194	501	S50100	1.7362	all size	248 to 327	24 to 38	
6 - 6F	A 194	410	S41000	1.4006	all size	228 to 271	20 to 28	
7L	A 194	4140	G41400	1.7225	all size	248 to 327	24 to 38	
7M	A 194	4140	G41400	1.7225	all size	159 to 237	22 max	
8	A 194	304	S30400	1.4301	all size	126 to 300		60 to 105
8C	A 194	347	S34700	1.4550	all size	126 to 300		60 to 105
8M	A 194	316	S31600	1.4401	all size	126 to 300		60 to 105
8T	A 194	321	S32100	1.4541	all size	126 to 300		60 to 105
8A	A 194	304	S30400	1.4301	all size	126 to 192		60 to 90
8CA	A 194	347	S34700	1.4550	all size	126 to 192		60 to 90
8MA	A 194	316	S31600	1.4401	all size	126 to 192		60 to 90
8TA	A 194	321	S32100	1.4541	all size	126 to 192		60 to 90

(COMPOSITION, percent)												
ALLOY	C	Mn max	P max	S max	Si max	Cr	Ni	Mo	V	Ti	Al max	Cb+Ta
2-2H	0,40 min	1,00	0,04	0,05	0,40	-	-	-	-	-	-	-
2HM	0,40 min	1,00	0,04	0,05	0,40	-	-	-	-	-	-	-
3	0,10 min	1,00	0,04	0,03	1,00	4,0 - 6,0	-	0,40-0,65	-	-	-	-
4L	0,40-0,50	0,70-0,90	0,035	0,04	0,15-0,35	-	-	0,20-0,30	-	-	-	-
6	0,15 max	1,00	0,04	0,03	1,00	11,5-13,5	-	-	-	-	-	-
6F	0,15 max	1,25	0,06	0,15	1,00	12,0-14,0	-	-	-	-	-	-
7L-7M	0,37-0,49	0,65-1,10	0,04	0,04	0,15-0,35	0,75-1,20	-	0,15-0,25	-	-	-	-
16	0,36-0,47	0,45-0,70	0,04	0,04	0,15-0,35	0,80-1,15	-	0,50-0,65	0,25-0,35	-	0,015	-
8-8A	0,08 max	2,00	0,05	0,03	1,00	18,0-20,0	8,0-10,50	-	-	-	-	-
8C-8CA	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	-	-	10xC min
8M-8MA	0,08 max	2,00	0,05	0,03	1,00	16,0-18,0	10,0-14,0	2,0-3,0	-	-	-	-
8T-8TA	0,08 max	2,00	0,05	0,03	1,00	17,0-19,0	9,0-12,0	-	-	5xC min	-	-

HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts Mechanical Requirements



HIGH TEMPERATURE RESISTING ALLOYS										
ALLOY	ASTM	UNS	W.-Nr.	Heat Treatment	Dia	Tensile Strength min, MPa	Yield Strength min,0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %	HB
600	B166	N06600	2.4816	solution annealed solution annealed solution annealed	under 1/2 1/2 to 3 over 3	655 620 585	310 275 240	20 25 30		
660**	A453	S66286	1.4980	sol+prec.harden	all size	895	585	15	18	248 - 341
662A**	A453	S66220	-	sol+prec.harden	all size	895	585	15	18	255 - 321
665B**	A453	S66545	1.4943	sol+prec.harden	all size	860	550	15	18	248 - 321
** Stress Rupture Test : temperature 650°C, stress >485 MPa; time to rupture >100 hours; elong. > 5%										
718	B637	N07718	2.4668	sol+prec.harden	all size	1275	1034	12	15	>331
X-750	B637	N07750	2.4669	solution annealed	all size	965	620	8	>310	
800H	B408	N08810	1.4876	solution annealed	all size	450	170	30		
80A	B637	N07080	2.4952	solution annealed	all size	930	620	20		

Mechanical Requirements

CORROSION RESISTING ALLOYS										
ALLOY	ASTM	UNS	W.-Nr.	Heat Treatment	Dia	Tensile Strength min, MPa	Yield Strength min,0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %	HRC
400	F468	N04400	2.4360	solution annealed	1/4 to 7/8	550	275	20		75-103HRB
500	F468	N05500	2.4375	solution annealed sol+prec.harden sol+prec.harden	1 to 11/2 1/4 to 7/8 1 to 11/2	480 900 900	205 620 590	20 20 20		60-103HRB 24-37 24-37
600	B166	N06600	2.4816	solution annealed solution annealed solution annealed	under 1/2 1/2 to 3 over 3	655 620 585	310 275 240	20 25 30		
625 G1	B446	N06625	2.4856	solution annealed	up to 4	825	415	30		
625 G2	B446	N06625	2.4856	solution annealed	all size	690	275	30		
660**	A453	S66286	1.4980	sol+prec.harden	all size	895	585	15	18	248-341HB
662A**	A453	S66220	-	sol+prec.harden	all size	895	585	15	18	255-321HB
665B**	A453	S66545	1.4943	sol+prec.harden	all size	860	550	15	18	248-321HB
** Stress Rupture Test : temperature 650°C, stress >485 MPa; time to rupture >100 hours; elong. > 5%										
276	F468	N10276	2.4819	solution annealed	all size	760	310	25		20-32
B2	B335	N10665	2.4617	solution annealed	all size	760	350	40		
C22	B574	N06022	2.4602	solution annealed	all size	690	310	45		
718	B637	N07718	2.4668	sol+prec.harden	all size	1275	1034	12	15	

Chemical Requirements

(COMPOSITION, percent)														
ALLOY	C	Mn max	P max	S max	Si max	Cr	Ni	Mo	Ti	OTHERS				
600	0,15	1,00	-	0,02	0,50	14,0-17,0	> 72,00	-	-	Cu 0,50	-	Fe6,0-10,0	-	-
660	0,08	2,00	0,04	0,03	1,00	13,5-16,0	24,0-27,0	1,00-1,50	1,90-2,35	V 0,1-0,5	Al 0,35max	-	B 0,001-0,01	-
662A	0,08	0,4-1,0	0,04	0,03	0,4-1,0	12,0-15,0	24,0-28,0	2,00-3,50	1,80-2,10	Cu 0,50	Al 0,35max	-	B 0,001-0,01	-
665B	0,08	1,25-2,0	0,04	0,03	0,1-0,8	12,0-15,0	24,0-28,0	1,25-2,25	2,70-3,30	Cu 0,25	Al 0,25max	-	B 0,01-0,07	-
718	0,08	0,35	0,02	0,02	0,35	17,0-21,0	50,0-55,0	2,80-3,30	0,65-1,15	Cu 0,30	Al 0,20-0,8	Cb+Ta4,75-5,5	B 0,006 max	Co 1,00 A
X-750	0,08	1,00	-	0,01	0,50	14,0-17,0	> 70,00	-	2,25-2,75	Cu 0,50	Al 0,40-1,0	Cb+Ta0,70-1,2	Fe 5,0-9,0	Co 1,00 A
800H	0,10	1,50	-	0,02	1,00	19,0-23,0	30,0-35,0	-	0,15-0,60	Cu 0,75	Al 0,15-0,6	-	Fe > 39,5	-
80A	0,10	1,00	-	0,02	1,00	18,0-21,0	balance	-	1,80-2,70	-	Al 0,50-1,8	-	Fe 3,00 max	-
400	0,30	2,00	-	0,02	0,50	-	63,0-70,0	-	-	Cu balance	-	-	Fe 2,50 max	B
500	0,25	1,50	-	0,01	0,50	-	63,0-70,0	-	0,35-0,85	Cu balance	Al 2,30-3,15	-	Fe 2,00 max	B
625	0,10	0,50	0,02	0,02	0,50	20,0-23,0	>58,00	8,0-10,0	0,40 max	-	Al 0,4max	Cb+Ta3,15-4,15	Fe 5,00 max	Co 1,00 A
276	0,01	1,00	0,04	0,03	0,08	14,5-16,5	balance	15,0-17,0	-	-	W 3,0-4,5	W 3,0-4,5	Fe 4,0-7,0	Co 2,5
B2	0,02	1,00	0,04	0,03	0,10	1,00 max	balance	26,0-30,0	-	-	-	-	Fe 2,00 max	Co 1,00 A
C22	0,02	0,50	0,02	0,02	0,08	20,0-22,5	balance	12,5-14,5	-	-	W 2,5-3,5	W 2,5-3,5	Fe 2,0-6,0	Co 2,5

HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts Mechanical Requirements



CORROSION RESISTING ALLOYS WITH HIGH YIELD LIMITS

ALLOY	ASTM	UNS	W.-Nr.		Heat Treatment	Dia	Tensile Strength min, MPa	Yield Strength min, 0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %	HB
F51 F44 F53	A182 A182 A182	S31803 S31254 S32750	1.4462 1.4529 1.4468	Duplex Super Duplex	solution annealed solution annealed solution annealed	all size all size all size	620 650 800	450 300 550	25 35 15	50 50	<310
F55 - 500	A182 A479 F467	S32760 S32550 N05500	1.4496 1.4515 2.4375	Super Duplex Super Duplex	sol + prec. harden solution annealed sol + prec. harden	all size all size 1/4 to 7/8	750-895 760 900	550 550 620	25 15 20	45	24-37 HRC
660**	A453	S66286	1.4980		sol + prec. harden sol + prec. harden	1 to 11/2 all size	900 895	590 585	20 15	18	24-37 HRC 248 - 341

** Stress Rupture Test : temperature 650°C, stress >385 MPa; time to rupture >100 hours; elong. > 5%

Chemical Requirements

(COMPOSITION, percent)													
ALLOY	UNS	C	Mn max	P max	S max	Si max	Cr max	Ni	Mo	Ti	W	OTHERS	
F51 F44 F53	S31803 S31254 S32750	0,03 0,02 0,03	2,00 1,00 1,20	0,03 0,03 0,04	0,02 0,01 0,02	1,00 0,80 0,80	21,0-23,0 19,5-20,5 24,0-26,0	4,50-6,50 17,5-18,5 6,0-8,0	2,5-3,5 6,0-6,5 3,0-5,0		- - -	- Cu 0,50-1,0 Cu 0,50	N 0,08-0,20 N 0,18-0,22 N 0,24-0,32
F55 - 660 500	S32760 S32550 S66286 N05500	0,03 0,04 0,08 0,25	1,00 1,50 2,00 1,50	0,03 0,04 0,04 -	0,01 0,03 0,03 0,01	1,00 1,00 1,00 0,50	24,0-26,0 24,0-27,0 13,5-16,0 Al 2,3-3,15	6,0-8,0 4,50-6,50 24,0-27,0 63,0-70,0	3,00-4,00 2,9-3,9 1,00-1,50 1,00-1,50		0,5-1,0 - 0,1-0,5	Cu 0,50-1,0 Cu 1,50-2,5 B 0,001-0,01 Cu balance	N 0,20-0,30 N 0,10-0,25 Al 0,35max Fe 2,00max

Mechanical Requirements

CORROSION RESISTING ALLOYS WITH LOW DENSITY

ALLOY	ASTM	UNS	W.-Nr.	Tensile Strength min, MPa	Yield Strength min, 0,2% MPa	Elongation in 4 D, min, %	Reduction of Area min, %
Ti gr. 1	B348	R50250	3.7025	240	170	24	30
Ti gr. 2	B348	R50400	3.7035	345	275	20	30
Ti gr. 3	B348	R50400	3.7055	450	380	18	30
Ti gr. 4	B348	R50400	3.7065	550	483	15	25
Ti gr. 5	B348	R56400	3.7165	895	828	10	25
Ti gr. 6	B348	R54520	-	828	795	10	25
Ti gr. 7	B348	R52400	3.7235	345	275	20	30
Ti gr. 9	B348	R58030	-	620	483	15	25
Ti gr. 11	B348	R52250	3.7225	240	170	24	30
Ti gr. 12	B348	R53400	-	483	345	18	25

Chemical Requirements

(COMPOSITION, percent)														
ALLOY	C max	Ni	Mo	V	Ti	Al max	Fe	O max	H max	N max	Sn	Pd	residual each max	residual total max
Ti gr.1	0,08	-	-	-	balance	-	0,20 max	0,18	0,015	0,03	-	-	0,10	0,40
Ti gr.2	0,08	-	-	-	balance	-	0,30 max	0,25	0,015	0,03	-	-	0,10	0,40
Ti gr.3	0,08	-	-	-	balance	-	0,30 max	0,35	0,015	0,05	-	-	0,10	0,40
Ti gr.4	0,08	-	-	-	balance	-	0,50 max	0,40	0,015	0,05	-	-	0,10	0,40
Ti gr.5	0,08	-	-	3,50-4,5	balance	5,5-6,75	0,40 max	0,20	0,015	0,05	-	-	0,10	0,40
Ti gr.6	0,08	-	-	-	balance	4,00-6,0	0,50 max	0,20	0,015	0,03	2,0-3,0	-	0,10	0,40
Ti gr.7	0,08	-	-	-	balance	-	0,30 max	0,25	0,015	0,03	-	0,12-0,25	0,10	0,40
Ti gr.9	0,08	-	-	2,00-3,0	balance	2,50-3,5	0,25 max	0,15	0,015	0,03	-	-	0,10	0,40
Ti gr.11	0,08	-	-	-	balance	-	0,20 max	0,18	0,015	0,03	-	0,12-0,25	0,10	0,40
Ti gr.12	0,08	0,6-0,9	0,2-0,4	-	balance	-	0,30 max	0,25	0,015	0,03	-	-	0,10	0,40

HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts

IMPERIAL RANGE 3/8" - 4"

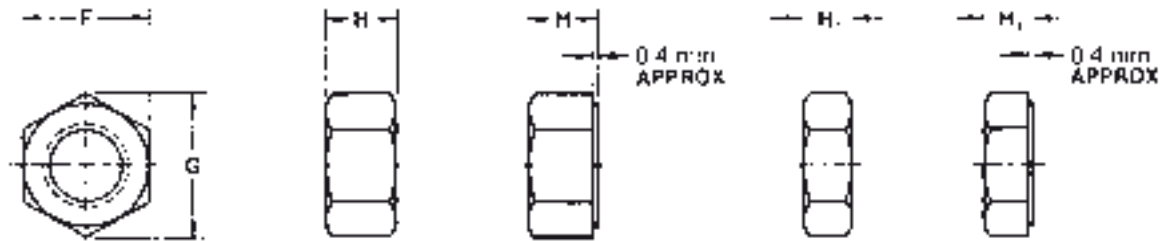


TABLE 9 - DIMENSIONS OF HEAVY HEX NUTS AND HEAVY HEX JAM NUTS

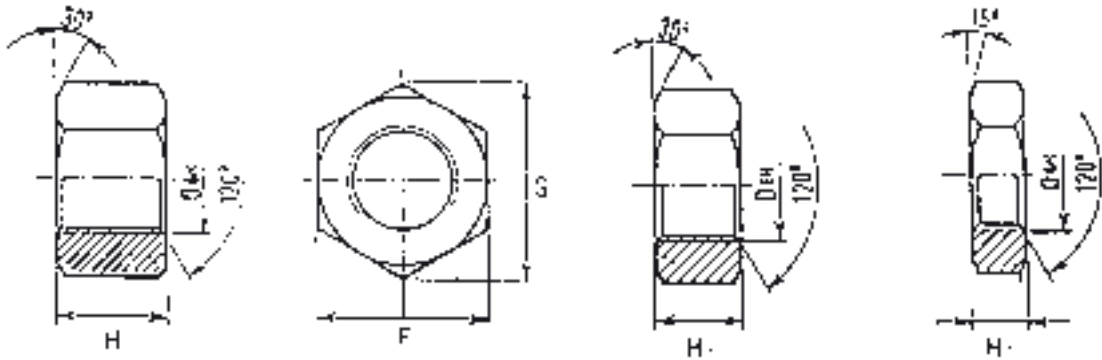
DIMENSIONS OF HEAVY HEX NUTS and HEAVY HEX JAM NUTS in mm. ASME B 18.2.2 - TABLE 9								
Nom. Size	F Width Across Flats		G Width Across Corners		H Thickness Heavy Hex Nuts		H ₁ Thickness Heavy Hex Jam Nuts	
	max	min	max	min	max	min	max	min
3/8"	17,48	16,99	20,17	19,38	9,58	8,66	6,40	5,49
7/16"	19,05	18,49	22,00	21,08	11,20	10,24	7,24	6,27
1/2"	22,23	21,59	25,65	24,61	12,80	11,79	8,05	7,04
9/16"	23,83	23,09	27,51	26,34	14,43	13,36	8,86	7,80
5/8"	26,97	26,19	31,17	29,85	16,03	14,91	9,68	8,56
3/4"	31,75	30,78	36,65	35,10	19,25	18,03	11,33	10,11
7/8"	36,53	35,41	42,16	40,36	22,48	21,16	12,95	11,63
1"	41,28	40,01	47,65	45,62	25,70	24,28	14,61	13,18
1 1/8"	46,02	44,60	53,16	50,88	28,93	27,41	16,23	14,71
1 1/4"	50,80	49,23	58,65	56,11	31,78	30,15	19,08	17,45
1 3/8"	55,58	53,82	64,16	61,37	35,00	33,27	20,70	18,97
1 1/2"	60,33	58,42	69,65	66,60	38,23	36,40	22,35	20,52
1 5/8"	65,07	63,02	75,16	71,83	41,45	39,52	23,98	22,05
1 3/4"	69,85	67,61	80,65	77,09	44,68	42,65	25,63	23,60
1 7/8"	74,63	72,24	86,16	82,35	47,90	45,77	27,25	25,12
2"	79,38	76,84	91,64	87,60	51,13	48,91	28,91	26,67
2 1/4"	88,90	86,06	102,64	98,09	57,18	54,74	31,78	29,34
2 1/2"	98,43	95,25	113,64	108,59	63,63	60,99	38,23	35,59
2 3/4"	107,95	104,44	124,64	119,08	70,08	67,23	41,50	38,66
3"	117,48	113,67	135,64	129,59	76,53	73,48	44,78	41,73
3 1/4"	127,00	122,89	146,66	140,08	82,60	79,35	47,65	44,40
3 1/2"	136,53	132,08	157,66	150,57	89,05	85,60	50,95	47,50
3 3/4"	146,05	141,27	168,66	161,06	95,50	91,85	54,20	50,55
4"	155,58	150,50	179,65	171,58	101,96	98,09	57,51	53,64



HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts

METRIC RANGE M8 - M100



DIMENSIONS OF HEX NUTS WITH METRIC COARSE AND FINE PITCH THREAD in mm.

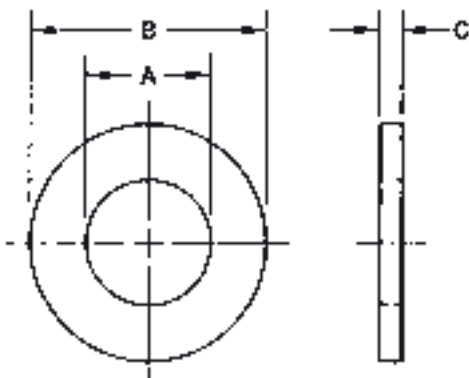
Nom. Size	F Width Across Flats		G Width Across Corners		H		H ₁ DIN 934 ISO 4032-exUNI 5588		H ₂ DIN 936 ISO 4035-exUNI 5589	
	max	min	max	min	max	min	max	min	max	min
M 8	13,00	12,73	15,00	14,38	8,00	7,64	6,50	6,14	5	4,7
M 10	17,00	16,73	19,60	18,90	10,00	9,64	8,00	7,64	6	5,7
M 12	19,00	18,67	21,90	21,10	12,00	11,57	10,00	9,64	7	6,64
M 14	22,00	21,67	25,40	24,49	14,00	13,57	11,00	10,30	8	7,64
M 16	24,00	23,67	27,70	26,75	16,00	15,57	13,00	12,30	8	7,64
M 18	27,00	26,67	31,10	30,14	18,00	17,57	15,00	14,30	9	8,64
M 20	30,00	29,67	34,60	33,53	20,00	19,48	16,00	14,90	9	8,64
M 22	32,00	31,61	36,90	35,72	22,00	21,48	18,00	16,90	10	9,64
M 24	36,00	35,38	41,50	39,98	24,00	23,48	19,00	17,70	10	9,64
M 27	41,00	40,38	47,30	45,63	27,00	26,48	22,00	20,70	12	11,57
M 30	46,00	45,38	53,10	51,28	30,00	29,48	24,00	22,70	12	11,57
M 33	50,00	49,26	57,70	55,80	33,00	32,38	26,00	24,70	14	13,57
M 36	55,00	54,26	63,50	61,31	36,00	35,38	29,00	27,40	14	13,57
M 39	60,00	59,26	69,30	66,96	39,00	38,38	31,00	29,40	16	15,57
M 42	65,00	64,26	75,00	72,61	42,00	41,38	34,00	32,40	16	15,57
M 45	70,00	69,26	80,80	78,26	45,00	44,38	36,00	34,40	18	17,57
M 48	75,00	74,26	86,50	83,91	48,00	47,38	38,00	36,40	18	17,57
M 52	80,00	79,26	92,40	89,56	52,00	51,38	42,00	40,40	20	19,48
M 56	85,00	84,15	98,10	95,07	56,00	55,26	45,00	43,40	22	21,48
M 60	90,00	89,13	103,90	100,72	60,00	59,26	48,00	46,40	24	23,48
M 64	95,00	94,13	109,70	106,37	64,00	63,26	51,00	49,10	26	25,48
M 68	100,00	99,13	115,50	112,02	68,00	67,26	54,00	52,10	26	25,48
M 72	105,00	104,13	121,25	117,67	72,00	71,26	58,00	56,10	28	27,48
M 76	110,00	109,13	127,00	123,32	76,00	75,26	61,00	59,10	30	29,48
M 80	115,00	114,13	132,80	128,97	80,00	79,26	64,00	62,10	32	31,38
M 85	120,00	119,13	138,60	134,62	85,00	84,13	68,00	66,10	34	33,38
M 90	130,00	129,00	150,10	145,77	90,00	89,13	72,00	70,10	36	35,38
M 95	135,00	134,00	155,90	151,42	95,00	94,13	76,00	74,10	38	37,38
M 100	145,00	144,00	167,40	162,72	100,00	99,13	80,00	78,10	40	39,38



HIGH TENSILE STUD BOLTS

High Tensile Stud Bolts

DIMENSIONS OF PLAIN WASHERS



DIMENSIONS OF PLAIN WASHERS in mm. ISO 7089-DIN 125-exUNI 6592 ASME B18.22.1 1965 (R1981)

Nom. Size		A	B	C
M 6	1/4"	6,4	12,5	1,6
M 7		7,4	14	1,6
M 8	5/16"	8,4	17	1,6
M 10	3/8"	10,5	21	2
M 12	7/16"	13	24	2,5
M 14	1/2"	15	28	2,5
M 16	9/16"	17	30	3
M 16	5/8"	17	30	3
M 18		19	34	3
M 20	3/4"	21	37	3
M 22	7/8"	23	39	3
M 24		25	44	4
M 27	1"	28	50	4
M 30	1 1/8"	31	56	4
M 33	1 1/4"	34	60	5
M 36	1 3/8"	37	66	5
M 39	1 1/2"	40	72	6
M 42	1 5/8"	43	78	7
M 45	1 3/4"	46	85	7
M 48	1 7/8"	50	92	8
M 52	2	54	98	8
M 56	2 1/4"	58	105	9
M 60		62	110	9
M 64	2 1/2"	66	115	9
M 68		70	120	10
M 72	2 3/4"	74	125	10
M 76	3"	78	135	10
M 80		82	140	12
M 85	3 1/4"	88	145	12
M 90	3 1/2"	93	160	12
M 95	3 3/4"	99	165	12
M 100	4"	104	175	14

Special and larger dimensions are produced on order



RAILWAY FASTENERS

Railway Products Specifications

	1. Elastic Rail Clip / E Clip Type: e1609, e1809, e1817, e2055 e2056, e2009, e2001, e2006, PR401, PR309... Raw Material: 60Si2MnA Surface: plain (oil), black paint, colour paint, zinc, hdg etc.
	2. Tension Clamp / Skl Clip Type: skl1, skl2, skl12, skl14... Raw Material: 38Si7, 60Si2CrA Surface: plain (oil), black paint, colour paint, zinc, hdg etc.
	3. Screw Spike / Sleeper Screw Type: Ss5, Ss8, Ss25, Ss36... all kinds acc. customers dwg Raw Material: Q235, 35K.45#, 40Mn2, 20Mnsi Grade: 4.6.5.6.8.8 Surface: plain (oil), black zinc, hdg etc.
	4. Dog Spike / Railroad Spike Type: All Kinds available according to customers drawings and samples Raw Material: Q235 Surface: Plain (oil)
	5. Fish Bolt / Track Bolt Standard: UIC, DIN, BS, ASTM... Raw Material: Q235, 35K.45# 40Mn2, 20Mnsi, 35CrMo, 40Cr, 42CrMo... Grade: 4.6, 4.8, 5.6, 8.8, 10.9, 12.9 Surface: Plain (oil), Black, Zinc, HDG
	6. T Bolt / Clip Bolt Type: Hs26, Hs32, Hs33... Raw Material: Q235, 35K.45# 40Mn2, 20Mnsi, 35CrMo, 40Cr, 42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	7. Fish Plate / Joint Bar Standard: UIC, BS, AREA, DIN Type: 115RE, 132RE, 133RE, BS75 UIC54, UIC60 Raw Material: 45#, 50# Surface: Plain (oil)

RAILWAY FASTENERS

Railway Products Specifications

	8. Rail Bolt / Metro Bolt Standard: UIC, DIN, BS, ASTM... Raw Material: Q234.35K,45#.40Mn2 20Mnsi.35CrMo.40Cr.42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	9. Double-End Bolt Standard: UIC, DIN, BS, ASTM... Raw Material: Q234.35K,45#.40Mn2 20Mnsi.35CrMo.40Cr.42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	10. Fish Bolt / Square Head Bolt Standard: UIC, DIN, BS, ASTM... Raw Material: Q234.35K,45#.40Mn2 20Mnsi.35CrMo.40Cr.42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	11. U Bolt Raw Material: Q234.35K,45#.40Mn2 20Mnsi.35CrMo.40Cr.42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	12. Square Head Bolt Raw Material: Q234.35K,45#.40Mn2 20Mnsi.35CrMo.40Cr.42CrMo... Grade: 4.6.4.8.5.6.8.8.10.9.12.9 Surface: Plain (oil), Black, Zinc, HDG
	13. Plastic Dowel / Guide Plate Type: All kinds available according to customers drawings and samples Raw Material: PA66 Surface: Plain
	14. Rail Pad Raw Material: EVA Surface: Plain

RAILWAY FASTENERS

Railway Products Specifications

	15. Crane Rail Clip Type: All according to customers drawings and samples Raw Material: Q234, AISI 1045... Surface: Plain (oil), Black, Zinc, HDG
	16. Nabla Clip Raw Material: 60Si2Mn Hardness: HRC41-48 Load Pressure: S-14N Surface: Color Painted, Dacro
	17. Clamp Plate / Rail Clamp Type: KP03, KP06... all according to customers drawing and samples Raw Material: Q234.45# Surface: Plain (oil), Black, Zinc, HDG
	18. Rail Anchor Type: All according to customers drawings and sample Raw Material: Q234.45# Surface: Plain (oil), Black, Zinc, HDG
	19. Shoulder Type: All according to customers drawings and samples Material: QT400-15, QT450-10, QT500-7 Surface: Plain
	20. Vibration Protecting Cardle Type: All kinds available according to customers drawings and samples Raw Material: QT400-15, QT450-10, QT500-7, ZG25, ZG35, ZG45 Surface: Plain (oil)
	21. Base Plate / Rail Plate Type: All kinds available according to customers drawings and samples Raw Material: QT400-15, QT450-10, QT500-7, ZG25, ZG35, ZG45 Surface: Plain (oil)
	22. Plastic Dowel / Guide Plate Raw Material: PA66, HDPE Surface: Plain

RAILWAY FASTENERS

Bolts



RAILWAY FASTENERS

Dog Spikes



E Clips



RAILWAY FASTENERS

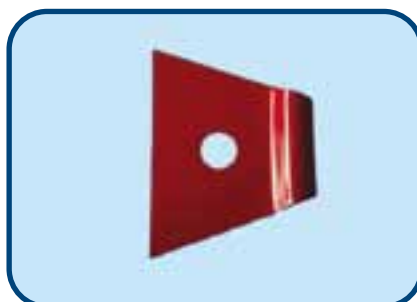
Fish Plate



Rail Anchor



Rail Clamp



Shoulder

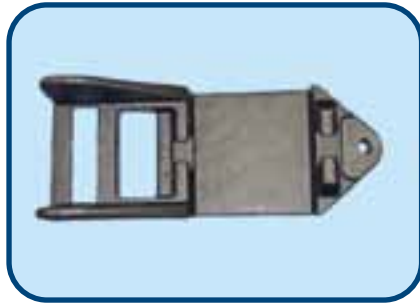


RAILWAY FASTENERS

SKL Clip



Vibration Protecting Cardle



Clamp Plate / Rail Clamp



Plastic Dowel / Guide Plate





HEXAGONAL HEAD BOLT

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Steel Full Threaded - Hot Dip Coated or Zinc Plated



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Steel ,Steel Zinc Plated,Hot Dip Coated or Yellow Passivated



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Steel ,Steel Zinc Plated, Hot Dip Coated or Yellow Passivated



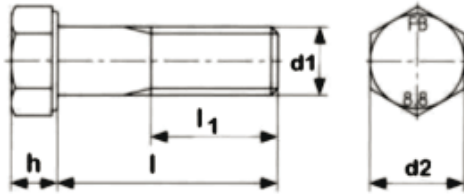
- 99 TENSILOCK-SELF LOCKING HEXAGON FLANGE BOLTS
Steel Full Threaded - Hot Dip Coated or Zinc Plated



HEXAGONAL HEAD BOLT

Hex Head Bolts

Steel: Zinc plated, Yellow plated, Black and H.D. Galvanized, Stainless Steel



Full Thread Grade 8.8

ISO : 4017
DIN : 933
ANSI : B18.2.3.1M
BSI : -
NEN : 1568



d1	M4	M5	M6	M8	M10	M10
p	0.7	0.8	1	1.25	1.5	1.5
d2	7	8	10	13	17	16
h	2.8	3.5	4	5.3	6.4	6.4

d1	M12	M12	M14	M14
p	1.75	1.75	2	2
d2	19	18	22	21
h	7.5	7.5	8.8	8.8

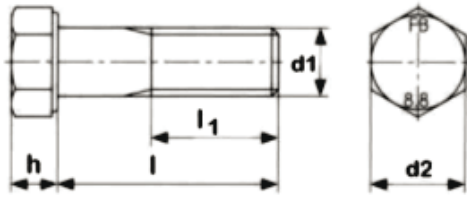
SIZE AVAILABLE							
d1 x l	d1 x l	d x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M4 x 10	M5 x 60	M6 x 120	M8 x 110	M10 x 70	M12 x 35	M12 x 130	M14 x 60
M4 x 12	M5 x 70	M6 x 150	M8 x 120	M10 x 75	M12 x 40	M12 x 140	M14 x 65
M4 x 16	M6 x 10	M8 x 12	M8 x 130	M10 x 80	M12 x 45	M12 x 150	M14 x 70
M4 x 20	M6 x 12	M8 x 16	M8 x 140	M10 x 80 x 60	M12 x 50	M12 x 160	M14 x 75
M4 x 25	M6 x 16	M8 x 20	M8 x 150	M10 x 85	M12 x 50 x 931	M12 x 170	M14 x 80
M4 x 30	M6 x 20	M8 x 25	M8 x 180	M10 x 90	M12 x 55	M12 x 180	M14 x 85
M4 x 35	M6 x 25	M8 x 28	M8 x 200	M10 x 90 x 60	M12 x 60	M12 x 200	M14 x 90
M4 x 40	M6 x 30	M8 x 30		M10 x 95	M12 x 60 x 931	M12 x 220	M14 x 95
M4 x 45	M6 x 35	M8 x 35	M10 x 16	M10 x 100	M12 x 65	M12 x *240	M14 x 100
M4 x 50	M6 x 40	M8 x 40	M10 x 20	M10 x 110	M12 x 70	M12 x 250	M14 x 110
M4 x 60	M6 x 45	M8 x 45	M10 x 25	M10 x 120	M12 x 75	M12 x 260	M14 x 120
M4 x 70	M6 x 50	M8 x 50	M10 x 30	M10 x 130	M12 x 80	M12 x 300	M14 x 130
	M6 x 55	M8 x 55	M10 x 35	M10 x 140	M12 x 80 x 60	M12 x 380	M14 x 140
M5 x 10	M6 x 60	M8 x 60	M10 x 40	M10 x 150	M12 x 85		M14 x 150
M5 x 12	M6 x 65	M8 x 65	M10 x 45	M10 x 160	M12 x 90	M14 x 25	M14 x 160
M5 x 16	M6 x 70	M8 x 70	M10 x 50	M10 x 180	M12 x 90 x 60	M14 x 30	M14 x 170
M5 x 20	M6 x 75	M8 x 75	M10 x 50 x 931	M10 x 200	M12 x 95	M14 x 35	M14 x 200
M5 x 25	M6 x 80	M8 x 80	M10 x 55		M12 x 100	M14 x 40	M14 x 220
M5 x 30	M6 x 85	M8 x 85	M10 x 60	M12 x 20	M12 x 110	M14 x 45	M14 x 250
M5 x 35	M6 x 90	M8 x 90	M10 x 60 x 931	M12 x 25	M12 x 120	M14 x 50	M14 x 280
M5 x 40	M6 x 95	M8 x 95	M10 x 60 x 933	M12 x 30	M12 x 120 x 15	M14 x 55	M14 x 300
M5 x 50	M6 x 100	M8 x 100	M10 x 65				

Sizes are According to ISO Standard

HEXAGONAL HEAD BOLT

Hex Head Bolts

Steel: Zinc plated, Yellow plated, Black and H.D. Galvanized, Stainless Steel



ISO	:	4017
DIN	:	933
ANSI	:	B18.2.3.1M
BSI	:	-
NEN	:	1568

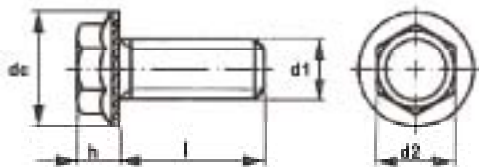


d1	M16	M18	M20	M22	M24	M27
p	2	2.5	2.5	2.5	3	3
d2	24	27	30	32	36	41
h	10	11.5	12.5	14	15	17

SIZE AVAILABLE							
d1 x l	d x l	d x l	d x l	d1 x l	d x l	d x l	d x l
M16 x 25	M16 x 150	M18 x 80	M20 x 35	M20 x 170	M22 x 50	M24 x 60	M24 x 280
M16 x 30	M16 x 160	M18 x 85	M20 x 40	M20 x 180	M22 x 55	M24 x 65	M24 x 300
M16 x 35	M16 x 170	M18 x 90	M20 x 45	M20 x 190	M22 x 60	M24 x 70	M24 x 350
M16 x 40	M16 x 180	M18 x 95	M20 x 50	M20 x 200	M22 x 65	M24 x 75	M24 x 360
M16 x 45	M16 x 200	M18 x 100	M20 x 55	M20 x 210	M22 x 70	M24 x 80	M24 x 400
M16 x 50	M16 x 210	M18 x 110	M20 x 60	M20 x 220	M22 x 75	M24 x 85	
M16 x 55	M16 x 250	M18 x 120	M20 x 65	M20 x 230	M22 x 80	M24 x 90	M27 x 60
M16 x 60	M16 x 260	M18 x 130	M20 x 70	M20 x 240	M22 x 85	M24 x 95	M27 x 70
M16 x 65	M16 x 300	M18 x 140	M20 x 75	M20 x 250	M22 x 90	M24 x 100	M27 x 80
M16 x 70	M16 x 400	M18 x 150	M20 x 80	M20 x 260	M22 x 95	M24 x 110	M27 x 90
M16 x 75		M18 x 160	M20 x 85	M20 x 280	M22 x 100	M24 x 120	M27 x 100
M16 x 80	M18 x 40	M18 x 170	M20 x 90	M20 x 300	M22 x 110	M24 x 130	M27 x 110
M16 x 85	M18 x 45	M18 x 175	M20 x 95	M20 x 320	M22 x 120	M24 x 140	M27 x 120
M16 x 90	M18 x 50	M18 x 180	M20 x 100	M20 x 340	M22 x 130	M24 x 150	M27 x 130
M16 x 95	M18 x 55	M18 x 190	M20 x 110	M20 x 360	M22 x 140	M24 x 160	M27 x 140
M16 x 100	M18 x 60	M18 x 200	M20 x 120	M20 x 380	M22 x 150	M24 x 170	
M16 x 110	M18 x 65	M18 x 220	M20 x 130	M20 x 400	M22 x 180	M24 x 180	
M16 x 120	M18 x 70	M18 x 260	M20 x 140	M20 x 450		M24 x 190	
M16 x 130	M18 x 75	M18 x 280	M20 x 150	M20 x 480	M24 x 50	M24 x 200	
M16 x 140		M18 x 340	M20 x 160	M20 x 700	M24 x 55	M24 x 250	

RIPP-SELF LOCKING HEXAGONAL FLANGE BOLTS

Steel Full Threaded - Hot Dip Coated or Zinc Plated



ISO	:	-
DIN	:	- 6921
ANSI	:	B18.3.4M
BS	:	



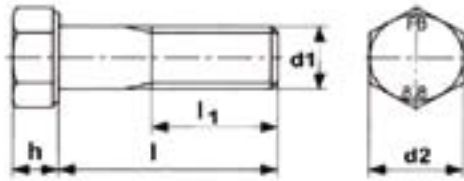
d1	M5	M6	M8	M10	M12	M16
P	0.8	1	1.25	1.5	1.75	2
h	4.3	5.5	7	8.5	10	14
d2	8	10	13	15	17	22
dc	11.2	14.2	18.2	21	24	31

SIZE AVAILABLE							
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M5 x 10	M6 x 12	M8 x 12	M8 x 40	M10 x 35	M12 x 30	M16 x 25	M16 x 45
M5 x 12	M6 x 16	M8 x 16		M10 x 40	M12 x 35	M16 x 30	M16 x 50
M5 x 16	M6 x 20	M8 x 20	M10 x 16		M12 x 40	M16 x 35	M16 x 55
M5 x 20	M6 x 25	M8 x 25	M10 x 20	M12 x 20	M12 x 45	M16 x 40	M16 x 60
	M6 x 30	M8 x 30	M10 x 25	M12 x 25	M12 x 50		M16 x 70
M6 x 10		M8 x 35	M10 x 30				

HEXAGONAL HEAD BOLT

HEXAGONAL HEAD BOLT

Steel ,Steel Zinc Plated, Hot Dip Coated or Yellow Passivated



ISO : 4014
DIN : 931
ANSI : B18.2.3.1M
BSI : -



d1	M4	M5	M6	M8	M10	M10 4	M12	M12 4
P	0.7	0.8	1	1.25	1.5	1.5	1.75	1.75
d2	7	8	10	13	17	16	19	19
h	2.8	3.5	4	5.3	6.4	6.4	7.5	7.5
l1	14	16	18	22	26	26	30	30
l2			24	28	32	-	36	36
l3					45	-	49	49

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d x l	d1 x l	d1 x l	d x l	d x l
M4 x 25	M6 x 30	M7 x 30	M8 x 70	M10 x 40/d2=17	M10 x 80/d2=17	M10 x 130/d2=17	M12 x 60/d2=18	M12 x 120/d2=19
M4 x 30	M6 x 33	M7 x 35	M8 x 75	M10 x 40/d2=16	M10 x 80/d2=16	M10 x 140/d2=17	M12 x 65/d2=19	M12 x 120/d2=18
M4 x 35	M6 x 40	M7 x 40	M8 x 80	M10 x 45/d2=17	M10 x 85/d2=17	M10 x 150/d2=17	M12 x 65/d2=18	M12 x 130/d2=19
M4 x 40	M6 x 45	M7 x 45	M8 x 90	M10 x 45/d2=16	M10 x 85/d2=16	M10 x 160/d2=17	M12 x 70/d2=19	M12 x 140/d2=19
M4 x 50	M6 x 50	M7 x 50	M8 x 100	M10 x 50/d2=17	M10 x 90/d2=17	M10 x 170/d2=17	M12 x 70/d2=18	M12 x 150/d2=19
	M6 x 55	M7 x 50	M8 x 110	M10 x 50/d2=16	M10 x 90/d2=16	M10 x 180/d2=17	M12 x 75/d2=19	M12 x 160/d2=19
M5 x 30	M6 x 60	M7 x 60	M8 x 120	M10 x 55/d2=17	M10 x 100/d2=17	M10 x 200/d2=17	M12 x 75/d2=18	M12 x 170/d2=19
M5 x 35	M6 x 65	M7 x 70	M8 x 130	M10 x 55/d2=16	M10 x 100/d2=16	M10 x 220/d2=17	M12 x 80/d2=19	M12 x 180/d2=19
M5 x 40	M6 x 70		M8 x 140	M10 x 60/d2=17	M10 x 110/d2=17		M12 x 80/d2=18	M12 x 190/d2=19
M5 x 45	M6 x 75	M8 x 35	M8 x 150	M10 x 60/d2=16	M10 x 110/d2=16	M12 x 45/d2=19	M12 x 90/d2=19	M12 x 200/d2=19
M5 x 50	M6 x 80	M8 x 40	M8 x 160	M10 x 65/d2=17	M10 x 100/d2=17	M12 x 45/d2=18	M12 x 90/d2=18	M12 x 220/d2=19
M5 x 55	M6 x 90	M8 x 45	M8 x 170	M10 x 65/d2=16	M10 x 100/d2=16	M12 x 50/d2=19	M12 x 100/d2=19	M12 x 240/d2=19
M5 x 60	M6 x 100	M8 x 50	M8 x 180	M10 x 70/d2=17	M10 x 110/d2=17	M12 x 50/d2=18	M12 x 100/d2=18	M12 x 260/d2=19
M5 x 70	M6 x 110	M8 x 55	M8 x 190	M10 x 70/d2=16	M10 x 110/d2=16	M12 x 55/d2=19	M12 x 110/d2=19	M12 x 280/d2=19
M5 x 80	M6 x 120	M8 x 60	M8 x 200	M10 x 75/d2=17	M10 x 120/d2=17	M12 x 55/d2=18	M12 x 110/d2=18	M12 x 300/d2=19
		M8 x 65		M10 x 75/d2=16	M10 x 120/d2=16	M12 x 60/d2=19		

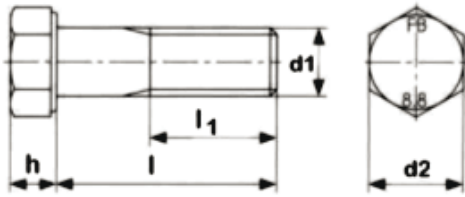
d1	M14	M14 4	M16	M18	M20	M22	M24	M27
P	2	2	2	2.5	2.5	2.5	3	3
d2	22	21	24	27	30	32	36	41
h	8.8	8.8	10	11.5	12.5	14	15	17
l1	34	34	38	42	46	50	54	60
l2	40	40	44	48	52	56	60	66
l3	53	-	57	61	65	69	73	79

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d x l	d1 x l	d1 x l	d x l	d x l
M14 x 50/d2=22	M14 x 120/d2=21	M16 x 120	M18 x 75	M20 x 65	M20 x 320	M22 x 280	M24 x 280	M27 x 180
M14 x 50/d2=21	M14 x 130/d2=22	M16 x 130	M18 x 80	M20 x 70	M20 x 340	M22 x 300	M24 x 300	M27 x 190
M14 x 55/d2=22	M14 x 140/d2=22	M16 x 140	M18 x 85	M20 x 75	M20 x 360		M24 x 320	M27 x 200
M14 x 55/d2=21	M14 x 150/d2=22	M16 x 160	M18 x 90	M20 x 80	M20 x 380	M24 x 70	M24 x 340	M27 x 220
M14 x 60/d2=22	M14 x 160/d2=22	M16 x 170	M18 x 100	M20 x 85	M20 x 400	M24 x 75	M24 x 360	M27 x 240
M14 x 60/d2=21	M14 x 180/d2=22	M16 x 180	M18 x 110	M20 x 90		M24 x 80	M24 x 380	M27 x 260
M14 x 65/d2=22	M14 x 200/d2=22	M16 x 190	M18 x 120	M20 x 100	M22 x 70	M24 x 90	M24 x 400	M27 x 280
M14 x 65/d2=21	M14 x 220/d2=22	M16 x 200	M18 x 130	M20 x 110	M22 x 75	M24 x 100	M24 x 420	M27 x 300
M14 x 70/d2=22	M14 x 240/d2=22	M16 x 210	M18 x 140	M20 x 130	M22 x 80	M24 x 110	M24 x 440	M27 x 320
M14 x 70/d2=21	M14 x 260/d2=22	M16 x 220	M18 x 150	M20 x 140	M22 x 90	M24 x 120		M27 x 340
M14 x 75/d2=22		M16 x 240	M18 x 160	M20 x 150	M22 x 100	M24 x 130	M27 x 80	M27 x 360
M14 x 80/d2=22	M16 x 55	M16 x 260	M18 x 180	M20 x 160	M22 x 120		M27 x 90	M27 x 380
M14 x 80/d2=21	M16 x 60	M16 x 280	M18 x 200	M20 x 180	M22 x 140	M24 x 140	M27 x 100	M27 x 400
M14 x 90/d2=22	M16 x 65	M16 x 300	M18 x 220	M20 x 200	M22 x 150	M24 x 150	M27 x 110	
M14 x 90/d2=21	M16 x 70	M16 x 320	M18 x 230	M20 x 220	M22 x 160	M24 x 160	M27 x 120	
M14 x 100/d2=22	M16 x 75		M18 x 240	M20 x 230	M22 x 180	M24 x 180	M27 x 130	
M14 x 100/d2=21	M16 x 80	M18 x 55	M18 x 260	M20 x 240	M22 x 200	M24 x 200	M27 x 140	
M14 x 110/d2=22	M16 x 90	M18 x 60	M18 x 280	M20 x 260	M22 x 220	M24 x 220	M27 x 150	
M14 x 110/d2=21	M16 x 100	M18 x 65	M18 x 300	M20 x 280	M22 x 240	M24 x 240	M27 x 160	
M14 x 120/d2=22	M16 x 110	M18 x 70	M18 x 320	M20 x 300	M22 x 260	M24 x 260	M27 x 170	

HEXAGONAL HEAD BOLT

HEXAGONAL HEAD BOLT

Steel ,Steel Zinc Plated, Hot Dip Coated or Yellow Passivated



ISO : 4014
DIN : 931
ANSI : B18.2.3.1M
BSI : -



d1	M30	M33	M36	M39
P	3.5	3.5	4	4
d2	46	50	55	60
h	18.7	21	22.5	25
l1	66	72	78	84
l2	72	78	84	90
l3	85	91	97	103

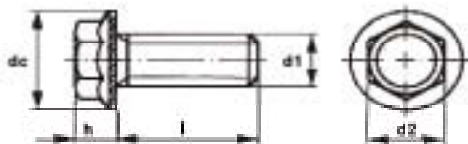
SIZE AVAILABLE							
d1 x l	d1 x l	d1 x l	d1 x l	d x l	d1 x l	d1 x l	d1 x l
M30 x 90	M30 x 190	M30 x 380	M33 x 140	M33 x 280	M36 x 150	M36 x 300	M39 x 120
M30 x 100	M30 x 200	M30 x 400	M33 x 150	M33 x 300	M36 x 160	M36 x 320	M39 x 130
M30 x 110	M30 x 220	M30 x 420	M33 x 160	M33 x 320	M36 x 170	M36 x 340	M39 x 140
M30 x 120	M30 x 240	M30 x 440	M33 x 170	M33 x 340	M36 x 180	M36 x 360	M39 x 150
M30 x 130	M30 x 260	M30 x 480	M33 x 180	M33 x 360	M36 x 190	M36 x 400	M39 x 160
M30 x 140	M30 x 280		M33 x 190		M36 x 200	M36 x 440	M39 x 170
M30 x 150	M30 x 300	M33 x 100	M33 x 200	M36 x 110	M36 x 220	M36 x 460	M39 x 180
M30 x 160	M30 x 320	M33 x 110	M33 x 220	M36 x 120	M36 x 240	M36 x 480	M39 x 190
M30 x 170	M30 x 340	M33 x 120	M33 x 240	M36 x 130	M36 x 260	M36 x 500	M39 x 200
M30 x 180	M30 x 360	M33 x 130	M33 x 260	M36 x 140	M36 x 280	M39 x 110	M39 x 220
							M39 x 240

d1	M39	M42	M45	M48	M52	M56	M60
P	4	4.5	4.5	5	5	5.5	5.5
d2	60	65	70	75	80	85	90
h	25	26	28	30	33	35	38
l1	84	90	96	102	-	-	-
l2	90	96	102	108	116	124	132
l3	103	109	115	121	129	137	145

SIZE AVAILABLE							
d1 x l	d1 x l	d1 x l	d1 x l	d x l	d1 x l	d1 x l	d1 x l
M39 x 260	M42 x 160	M42 x 400	M45 x 200	M48 x 150	M48 x 400	M52 x 400	M56 x 360
M39 x 280	M42 x 180	M42 x 420	M45 x 220	M48 x 160	M48 x 500	M52 x 500	M56 x 400
M39 x 300	M42 x 200	M42 x 460	M45 x 240	M48 x 170			M56 x 440
M39 x 320	M42 x 220	M42 x 480	M45 x 280	M48 x 180	M52 x 160	M56 x 160	
M39 x 340	M42 x 240	M42 x 500	M45 x 300	M48 x 200	M52 x 180	M56 x 180	M60 x 160
M39 x 360	M42 x 260		M45 x 320	M48 x 240	M52 x 200	M56 x 200	M60 x 180
M39 x 400	M42 x 280	M45 x 120	M45 x 360	M48 x 260	M52 x 240	M56 x 240	M60 x 200
	M42 x 320	M45 x 140	M45 x 400	M48 x 280	M52 x 280	M56 x 260	M60 x 240
M42 x 140	M42 x 340	M45 x 160		M48 x 300	M52 x 320	M56 x 280	M60 x 280
M42 x 150	M42 x 360	M45 x 180	M48 x 140	M48 x 320	M52 x 360	M56 x 320	M60 x 320
				M48 x 360			M60 x 360

HEXAGONAL HEAD BOLT

TENSILOCK-SELF LOCKING HEXAGON FLANGE BOLTS
Steel Full Threaded - Hot Dip Coated or Zinc Plated



ISO : -
DIN : - 6921
ANSI : B18.3.4M
BS :



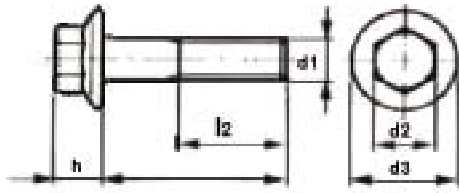
d1	M5	M6	M8	M10	M12 2	M16 2
P	0.8	1	1.25	1.5	1.75	
h	4.3	5.5	7	8.5	10	
d2	8	10	13	15	17	
dc	11.2	14.2	18.2	21	24	

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M5 x 10	M6 x 10	M6 x 25	M8 x 20	M10 x 16	M10 x 40	M12 x 35	M16 x 25	M16 x 50
M5 x 12	M6 x 12	M6 x 30	M8 x 25	M10 x 20		M12 x 40	M16 x 30	M16 x 55
M5 x 16	M6 x 16		M8 x 30	M10 x 25	M12 x 20	M12 x 45	M16 x 35	M16 x 60
M5 x 20	M6 x 20	M8 x 12	M8 x 35	M10 x 30	M12 x 25	M12 x 50	M16 x 40	M16 x 70
		M8 x 16	M8 x 40	M10 x 35	M12 x 30		M16 x 45	

HEXAGONAL HEAD BOLT

HEXAGONAL FLANGE BOLTS

Steel Zinc Plated, Hot Dip Coated or Yellow Passivated



ISO : -
DIN : - 6921
ANSI : B18.3.4M
BS : -



d1	M6	M8	M10	M12	M14	M16	M20
P	1	1.25	1.5	1.75	2	2	2.5
l1	18	22	26	30	34	38	46
h (max)	6.6	8.1	9.2	11.5	12.8	14.4	17.1
d2	10	13	15	16	18	21	27
d3	14.2	18	22.3	26.6	30.5	35	43

SIZE AVAILABLE							
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M6 x 20	M8 x 20	M10 x 20	M10 x 70	M12 x 45	M14 x 45	M16 x 40	M20 x 50
M6 x 25	M8 x 25	M10 x 25		M12 x 50	M14 x 50	M16 x 45	M20 x 60
M6 x 30	M8 x 30	M10 x 30	M12 x 25	M12 x 60	M14 x 60	M16 x 50	M20 x 70
M6 x 40	M8 x 40	M10 x 40	M12 x 30	M12 x 90	M14 x 80	M16 x 60	M20 x 80
M6 x 50	M8 x 50	M10 x 50	M12 x 35			M16 x 70	M20 x 90
		M10 x 60	M12 x 40	M14 x 35	M16 x 35		M20 x 100
				M14 x 40		M20 x 40	M20 x 120



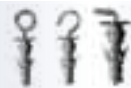
ANCHORING SYSTEM

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115 PLASTIC TOGGLE



116 PLASTER BOARD ANCHOR



116 ACCESSORIES and ADDITIONAL PRODUCTS



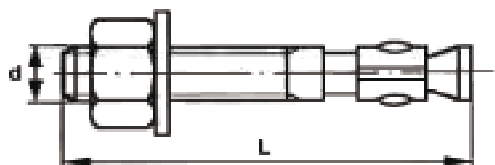
116 SCREWPLUG - Nylon



ANCHORING SYSTEM

RED HEAD - WEDGE ANCHORS

Steel Zinc Plated & Stainless Steel A4



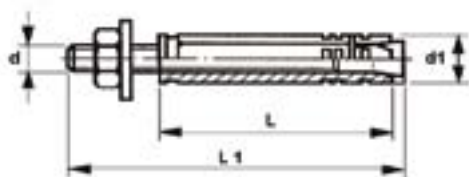
ANCHORS		TYPE	DRILL DEPTH	Grip range	Drill Ø	Concrete B25 Pull - Out FORCES in KN
d Diameter (mm)	L - Length (mm)					
M6	40	FA 6-5	40	5	6	3.7
	65	FA 6-10	60	10		5.5
	80	FA 6-25	60	25		5.5
M8	50	FA 8-5	45	5	8	5.5
	75	FA 8-10	65	10		10.3
	85	FA 8-20	65	20		10.3
	110	FA 8-45	65	45		10.3
M10	80	FA 10-10	70	10	10	14.8
	90	FA 10-20		20		
	120	FA 10-50		50		
M12	95	FA 12-10	80	10	12	11.1
	110	FA 12-20	90	20		21.1
	120	FA 12-30	90	30		
	155	FA 12-65	90	65		
	195	FA 12-105	90	105		
	235	FA 12-145	90	145		
	250	FA 12-160	90	160		
M16	115	FA 16-15	110	15	16	31.1
	145	FA 16-30		30		
	195	FA 16-80		60		
	235	FA 16-120		120		
	280	FA 16-165		165		
M20	120	FA 20-10	110	10	20	41.4
	145	FA 20-25		25		
	160	FA 20-40		40		
	215	FA 20-100		100		
	240	FA 20-120		120		

Assembly Sequence



ANCHORING SYSTEM

EXPANDING BOLTS Steel and Steel Zinc Plated



ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :



d	M8	M10
P	1.25	1.5
d1 = drill Ø	14	16
Drill depth	50	60

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L1 x L
M8 x 70 x 50	M10 x 70 x 60	

d	M5	M5	M5	M6	M6	M6	M6	M8	M8	M8	M8
L1	50	60	80	50	60	75	100	55	75	75	100
L	35	35	35	35	40	40	40	40	40	50	50
Grip range	10	20	40	8	13	28	53	7	27	37	42
d1 = drill Ø	8	8	8	10	10	10	10	14	14	14	14
Drill depth	40	40	40	40	45	45	45	45	45	55	55
Tightening torque in Nm	3.3	3.3	3.3	6	6	6	6	14	14	14	14
Pull-out force in kN	9.3	9.3	9.3	16.7	16.7	16.7	16.7	19.9	19.9	19.9	19.9

d	M8	M8	M10	M10	M10	M10	M10	M10	M10	M10	M12
L1	140	160	70	80	80	100	100	120	140	160	80
L	50	20	50	50	60	50	60	60	60	60	60
Grip range	82	102	10	21	10	40	30	50	70	90	8
d1 = drill Ø	14	14	16	16	16	16	16	16	16	16	20
Drill depth	55	55	55	55	65	25	65	65	65	66	70
Tightening torque in Nm	14	14	2.7	27	27	27	27	27	27	27	46
Pull-out force in kN	19.9	19.9	29.8	29.8	29.8	29.8	29.8	29.8	29.8	29.8	44

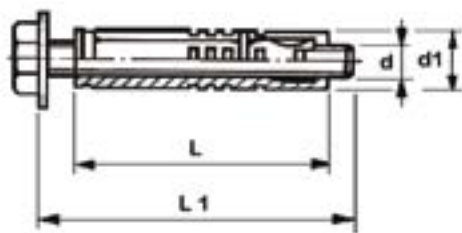
d	M12	M12	M12	M12	M12	M12	M12	M16	M16	M16
L1	90	110	110	120	140	160	160	110	140	140
L	60	60	80	80	100	80	100	60	80	100
Grip range	18	38	18	18	28	68	48	15	45	25
d1 = drill Ø	20	20	20	20	20	20	20	25	25	25
Drill depth	70	70	90	90	110	90	110	90	90	110
Tightening torque in Nm	46	46	16	46	46	46	46	110	110	110
Pull-out force in kN	44	44	44	44	44	44	44	75	75	75

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L1 x L
M5 x 50 x 35	M8 x 140 x 50	M12 x 90 x 60
M5 x 60 x 35	M8 x 140 x 50	M12 x 110 x 60
M5 x 80 x 35		M12 x 110 x 80
	M10 x 70 x 50	M12 x 120 x 80
M6 x 50 x 35	M10 x 80 x 50	M12 x 140 x 100
M6 x 60 x 40	M10 x 80 x 60	M12 x 160 x 80
M6 x 70 x 40	M10 x 100 x 50	M12 x 160 x 100
M6 x 100 x 40	M10 x 100 x 60	
	M10 x 120 x 60	M16 x 110 x 80
M8 x 55 x 40	M10 x 140 x 60	M16 x 140 x 80
M8 x 75 x 40	M10 x 160 x 60	M16 x 140 x 8100
M8 x 75 x 50		
M8 x 100 x 50	M12x 80 x 60	

ANCHORING SYSTEM

EXPANDING BOLTS

Steel Zinc Plated



ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :

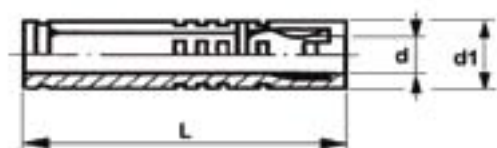


d	M6	M6	M8	M8	M10	M10	M12	M12
L1	50	70	65	90	70	90	90	120
L	40	40	40	50	60	60	80	80
Grip range	15	35	20	45	15	35	20	50
d1 = drill Ø	10	10	14	14	16	16	20	20
Drill depth	40	40	50	50	60	60	80	80
	6	6	14	14	27	27	46	46
Pull-out force in kN	10.26	10.26	14.34	14.34	22.57	22.57	37.09	37.09

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L1 x L
M6 x 50 x 40	M8 x 90 x 50	M10 x 90 x 60
M6 x 70 x 40		
	M10 x 70 x 60	M12 x 90 x 60
M8 x 65 x 50		M12 x 120 x 80

EXPANDING SHELLS

Steel Zinc Plated, Yellow Passivated & Stainless Steel A4



ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :

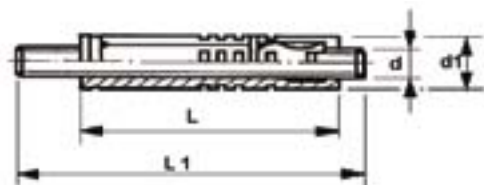


d	M6	M8	M10	M12
P	1	1.25	1.5	1.75
d1 = drill Ø	10	14	16	20
Drill depth	40	50	60	80
Pull-out force in kN	10	14.34	22.57	37.09

SIZE AVAILABLE		
d x L	d x L	d x L
M6 x 40	M10 x 60	M12 x 80
M6 x 50		

ANCHORING SYSTEM

EXPANDING SHELLS with THREADED PIN Steel Zinc Plated & Yellow Passivated



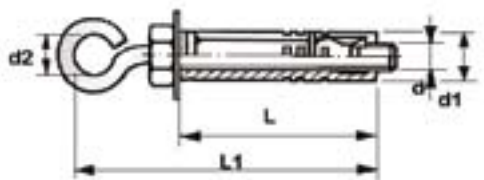
ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :



d	M8	M10
P	1.25	1.5
d1 = drill Ø	14	16
Drill depth	50	60

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L1 x L
M8 x 70 x 50	M10 x 70 x 60	

EXPANDING SHELLS with EYE BOLT - Steel Zinc Plated



ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :

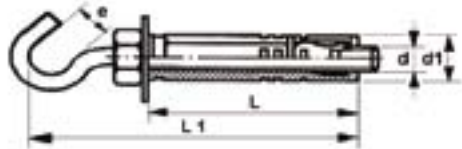


d	M5	M6	M8	M10	M12
P	0.8	1	1.25	1.5	1.75
d2	9	10	14	18	22
d1 = drill Ø	8	10	14	16	20
Drill depth	35	40	50	60	80

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L
M5 x 60 x 35	M8 x 90 x 50	M12 x 140 x 80
M5 x 70 x 40	M10 x 110 x 60	

ANCHORING SYSTEM

EXPANDING SHELLS with OPEN EYE BOLT Steel Zinc Plated & Yellow Passivated



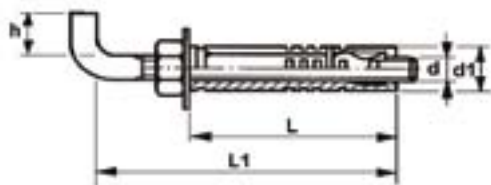
ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :



d	M5	M6	M8	M10	M12
P	0.8	1	1.25	1.5	1.75
e	8	10	12	16	20
d1 = drill Ø	8	10	14	16	20
Drill depth	35	40	50	60	80

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L1 x L
M5 x 60 x 35	M8 x 90 x 50	M12 x 140 x 80
M6 x 70 x 40	M10 x 110 x 60	

EXPANDING SHELLS with HOOK BOLT Steel Zinc Plated



ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :

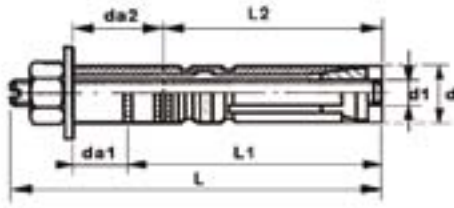


d	M5	M6	M8
P	0.8	1	1.25
h	9	10	14
d1 = drill Ø	8	10	14
Drill depth	35	40	50

SIZE AVAILABLE		
d x L1 x L	d x L1 x L	d x L
M5 x 50 X 35	M6 x 90 X 40	M8 x 75 x 50

ANCHORING SYSTEM

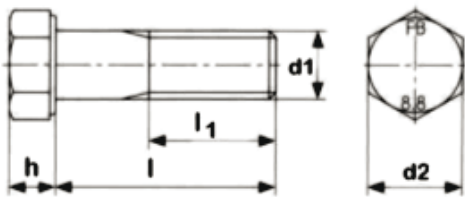
RED HEAD - HIGH LOAD ANCHORS Type B
Steel Zinc Plated & Stainless Steel A4



ANCHORS		TYPE	DRILL DEPTH		Grip range		Drill Ø	Concrete B25 Pull - Out FORCES in KN
d1 - Diameter (mm)	L - Length (mm)		t1	t2	da1	da2	d	
M6	55	10/0/10B	60	50	0	10	10	11.8
	65	10/10/20B			10	20		
	80	10/25/35B			25	35		
	110	10/50/60B			50	60		
	160	10/100/110B			100	110		
M8	65	12/0/15B	70	55	0	15	12	15.9
	75	12/10/25B			10	25		
	90	12/25/40B			25	40		
	120	12/50/65B			50	65		
	170	12/100/115B			115	170		
M10	75	14/0/15B	85	70	0	15	14	26.2
	85	14/10/25B			10	25		
	100	14/25/40B			25	40		
	130	14/50/65B			50	65		
	180	14/100/115B			100	115		
M12	100	18/0/20B	100	80	0	20	18	38.8
	110	18/15/35B			15	35		
	140	18/40/60B			40	60		
	170	18/70/90B			70	90		
	200	18/100/120B			100	120		
M16	120	24/0/20B	125	105	0	20	24	55.5
	140	24/25/45B			25	45		
	170	24/50/70B			50	70		
	220	24/100/120B			100	120		
M20	140	28/0/25B	150	125	0	25	28	81.4
	170	28/30/55B			30	55		
	200	28/60/85B			60	65		
	240	28/100/125B			100	125		

ANCHORING SYSTEM

RED HEAD - CHEMICAL ANCHORS - ANCHORS STUDS Steel Zinc Plated & Stainless Steel A4

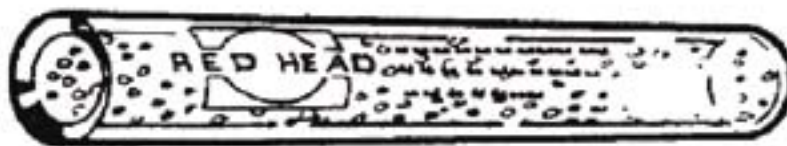


ISO : -
DIN : -
NEN : 2316
ANSI :
BS :
NF :



ANCHORS		TYPE	Grip range	Pull-Out Force in KN
d - Diameter (mm)	L - Length (mm)			Concrete B25
M8	110	KM8	16	14.8
M10	130	KM10	22	29.5
M12	160	KM12	30	37
M16	190	KM16	38	55.5
M20	260	KM20	70	99.9
M24	300	KM24	65	136.9
M30	380	KM30	70	222

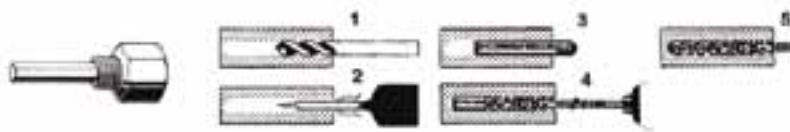
RED HEAD - CHEMICAL ANCHORS RESIN CAPSULE - GLASS



TYPE	KM8	KM10	KM12	KM16	KM20	KM24	KM30
Drill Ø	10	12	14	18	25	28	35
Drill depth	80	90	110	125	170	210	280

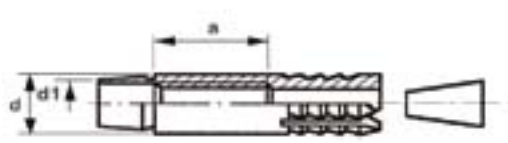
SIZE AVAILABLE		
TYPE	TYPE	TYPE
KM8	KM16	KM24
KM10	KM20	KM30
KM12		

Assembly Sequence



ANCHORING SYSTEM

RED HEAD - SELF DRILLING ANCHORS Steel Zinc Plated



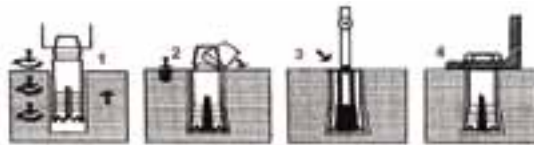
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NEN : 2316
ANSI :
BS :
NF :



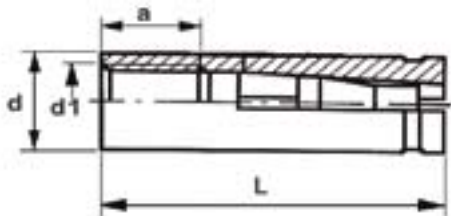
TYPE	S 6M	S 8M	S 10M	S 12M	S 16M	S 20M
d	11	12	15	17.5	21.4	25.5
d1	M6	M8	M10	M12	M16	M20
a	10	12	14.5	21	25	31
Drill depth = installation depth	27.8	33.3	40	53	62.7	83
Pull-Out Forces in KN	3.7	5.9	12.6	19.6	24.4	29.6

SIZE AVAILABLE		
TYPE	TYPE	TYPE
S 6M	S 10M	S 16M
S 8M	S 12M	S 20M

Assembly Sequence



RED HEAD - DROP - IN ANCHORS JUNIOR-EN Stainless Steel A4, and Steel Zinc Plated



TYPE	EN 5M	EN 6M	EN 8M	EN 10M	EN 12M	EN 16M	EN 16M
d=Drill Ø	8	8	10	12	15	20	20
L=drill depth	25	28	30	40	50	65	65
d1	M5	M6	M8	M10	M12	M16	M16
a	11	11	13	15	18	23	23
Pull-Out Forces in KN	2.2	3.7	6.6	13.3	21.1	27.3	41.8

SIZE AVAILABLE		
TYPE	TYPE	TYPE
EN 5M	EN 10M	EN 16M
EN 6M	EN 12M	EN 20M
EN 8M		

SIZE AVAILABLE		
SJN TYPE	SJN TYPE	SJN TYPE
SJN 5	SJN 10	SJN 16
SJN 6	SJN 12	SJN 20
SJN 8		

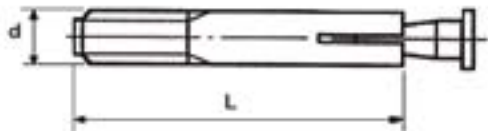
Assembly Sequence



ANCHORING SYSTEM

RED HEAD - STUD ANCHORS

Stainless Steel A4, and Steel Zinc Plated

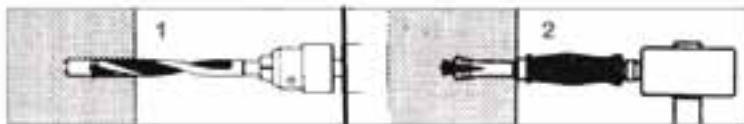


TYPE	M6-2	M6-4	M6-6	M8-2	M8-4	M8-6	M10-2	M10-4	M10-6
d	M6	M6	M6	M8	M8	M8	M10	M10	M10
L	45	55	80	50	65	90	60	75	95
Grip range	12.4	22.4	47.4	10.4	25.4	50.4	13.5	28.5	48.5
Drill Ø	6	6	6	8	8	8	10	10	10
Drill depth	34	34	34	40	40	40	43	43	43
Pull-Out Forces in KN	7.9	7.9	7.9	15.6	15.6	15.6	20.2	20.2	20.2

TYPE	M12-2	M12-4	M12-6	M16-2	M16-4	M16-6	M20-2	M20-4	M20-6
d	M12	M12	M12	M16	M16	M16	M20	M20	M20
L	70	110	135	85	125	175	110	160	215
Grip range	16	66	81	17	57	107	24	74	129
Drill Ø	32	12	12	16	16	16	20	20	20
Drill depth	48	48	48	60	60	60	75	75	75
Pull-Out Forces in KN	28	28	28	38.3	38.3	38.3	58.3	58.3	58.3

SIZE AVAILABLE		
TYPE	TYPE	TYPE
M6 - 2	M10 - 2	M16 - 2
M6 - 4	M10 - 4	M16 - 4
M6 - 6	M10 - 6	M16 - 6
M8 - 2	M12 - 2	M20 - 2
M8 - 4	M12 - 4	M20 - 4
M8 - 6	M12 - 6	M20 - 6

Assembly Sequence



ANCHORING SYSTEM

FIXINGS Nylon Plugs



Diameter	Screw g
5.0	5-7g
6.0	6-8g
8.0	10-14g
10.0	6-8mm
	Coach Screw

Wall Plug



Colour	Screw g	Drill
Yellow	6-8	5.0
Red	8-10	6.0
Brown	10-14	7.0
Blue	14-18	10.0

Hammer Fixings



Code No.	Size
5/6	M5 x 34
6/12	M6 x 42
6/25	M6 x 55
6/40	M6 x 70
8/12	M8 x 54
8/30	M8 x 72
	M8 x 105
	M8 x 125

Window Anchors



Size
8 x 100
8 x 140
10 x 100
10 x 120
10 x 140
M8 x 125

ANCHORING SYSTEM

SANITARY CAVITY ANCHOR - NYLON



SCREW TYPE	Hole Diameter (mm)	MATERIAL
EYEBOLT	9	NYLON
WIREHOOK	9	NYLON
SHORT HOOK	9	NYLON
MEDIUM HOOK	9	NYLON
LONG HOOK	9	NYLON
THREADED ROD	9	NYLON
SCREW	9	NYLON

SCREW TYPE	Hole Diameter (mm)	MATERIAL
EYEBOLT	12	NYLON
WIREHOOK	12	NYLON
SHORT HOOK	12	NYLON
MEDIUM HOOK	12	NYLON
LONG HOOK	12	NYLON
THREADED ROD	12	NYLON
SCREW	12	NYLON

SANITARY CAVITY ANCHOR - METAL



SCREW TYPE	Hole Diameter (mm)	MATERIAL
EYEBOLT	8	NYLON
WIREHOOK	8	NYLON
SHORT HOOK	8	NYLON
MEDIUM HOOK	8	NYLON
LONG HOOK	8	NYLON
THREADED ROD	8	NYLON
SCREW	8	NYLON

SCREW TYPE	Hole Diameter (mm)	MATERIAL
EYEBOLT	9	NYLON
WIREHOOK	9	NYLON
SHORT HOOK	9	NYLON
MEDIUM HOOK	9	NYLON
LONG HOOK	9	NYLON
THREADED ROD	9	NYLON
SCREW	9	NYLON

ANCHORING SYSTEM

BUTTERFLY TOGGLE ANCHOR



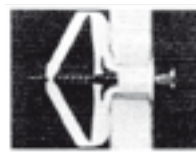
1. Push Wings together

2. Push Compressed Wings through hole

3. Insert Screw to force wings open

Reference	Hole Size	Fixture Allowance
BT - 14	10MM	14MM
BT - 16	10MM	16MM

NYLON TOGGLE ANCHOR



Reference	Wood Screw Size (mm)	Wood Screw Gauge (mm)	Thickness Range (mm)	Min. Cavity Depth (mm)	Hole Diameter (mm)	Tensile Load Kn
NT A10	3.5 - 4.0	6 - 8	10 - 12	30	8	0.12
NT A12	3.5 - 4.0	6 - 8	12 - 16	35	8	0.12
NT A16	3.5 - 4.0	6 - 8	16 - 19	40	8	0.12

PLASTIC TOGGLE



Reference	Wood Screw Size (mm)	Wood Screw Gauge (mm)	Thickness Range (mm)	Min. Cavity Depth (mm)	Hole Diameter (mm)	Tensile Load Kn
PT 12	4	6 - 8	3 - 12	25	8	0.13

ANCHORING SYSTEM

PLASTER BOARD ANCHOR



Zinc Alloy
SCREW DRIVER BITS



Nylon
WITH EXTERNAL THREAD
(Plumbing Application)

Reference	Screw Diameter (mm)	Screw Length (mm)	Max Fixture Thickness (mm)	Anchor Length (mm)	Tensile Load kN
PB M	4	30	15	35	100
PB N	4	30	15	35	80

* ANCHORS SUPPLIED WITH SCREWS

* KIT PACKS ARE AVAILABLE ON REQUEST

ACCESSORIES and ADDITIONAL PRODUCTS

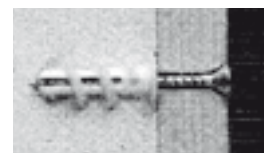


SCREW DRIVER BITS



WITH EXTERNAL THREAD
(Plumbing Application)

SCREW PLUG - Nylon



Reference	Thread Diameter (mm)	Hole Depth (mm)	Tensile Load Kn	Shear Load Kn
NT A10	4.5 - 5	min. 23	0.06	0.18
TOOL	Setting Tool	-	-	-



SCREWS

CONTENTS

122 SLOTTED CHEESE HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel 

122 SLOTTED COUNTERSUNK HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel 

123 SLOTTED PAN HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel 

123 SLOTTED RAISED COUNTERSUNK HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel 

123 SLOTTED MUSHROOM HEAD SCREWS - Steel Zinc Plated 

124 SLOTTED SCREW and WASHER ASSEMBLYS with PLAIN WASHER Steel Zinc Plated, Yellow Passivated 

124 CROSS RECESSED PAN HEAD SCREWS Steel Zinc Plated, Yellow and Black Passivated 

124 CROSS RECESSED PAN HEAD SCREWS Steel Zinc Plated, Yellow and Black Passivated 

125 CROSS RECESSED COUNTER HEAD SCREWS Steel Zinc Plated and Zinc Plated, Black Passivated 

125 CROSS RECESSED COUNTER HEAD SCREWS Steel Zinc Plated and Zinc Plated, Black Passivated 

125 HEXALOBULAR PAN HEAD SCREWS Steel Zinc Plated 

126 HEXAGON HEAD THREAD CUTTING SCREWS 

126 CROSS RECESSED RAISED CHEESE HEAD TREAD CUTTING SCREW - Steel Zinc Plated 

126 CROSS RECESSED RAISED COUNTERSUNK HEAD THREAD CUTTING SCREWS - Steel Zinc Plated 

127 CROSS RECESSED RAISED CHEESE HEAD TREAD CUTTING SCREW - Steel Zinc Plated 

128 TAPTITE THREAD FORMING BOLTS and SCREWS 

129 TAPTITE - SLOTTED CHEESE HEAD THREAD FORMING SCREWS Steel Zinc Plated 

129 TAPTITE - CROSS RECESSED RAISED CHEESE HEAD THREAD FORMING SCREWS - Steel Zinc Plated 

129 TAPTITE - CROSS RECESSED COUNTERSUNK HEAD THREAD FORMING SCREWS - Steel Zinc Plated 

130 TAPTITE- CROSS RECESSED RAISED COUNTERSUNK HEAD THREAD FORMING SCREWS - Steel Zinc Plated 

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130 TAPTITE - HEXAGON HEAD THREAD FORMING SCREWS
Steel Zinc Plated



130 TAPTITE - HEXAGON HEAD THREAD FORMING SCREWS with FLANGE
Steel Zinc Plated



131 EJOT PT - CROSS RECESSED THREAD FORMING MUSHROOM
HEAD SCREWS - Steel Zinc Plated



131 EJOT PT - CROSS RECESSED THREAD FORMING RAISED CHEESE
HEAD SCREWS - Steel Zinc Plated



131 EJOT PT - TORX THREAD FORMING RAISED CHEESE
HEAD SCREWS - Steel Zinc Plated



132 SLOTTED COUNTERSUNK HEAD TAPPING SCREWS
Steel Zinc Plated and Steel Nickel Plated



132 SLOTTED RAISED COUNTERSUNK HEAD TAPPING SCREWS
Steel Zinc Plated and Steel Nickel Plated



132 SLOTTED PAN HEAD TAPPING SCREWS
Steel Zinc Plated and Steel Nickel Plated



133 SLOTTED RAISED COUNTERSUNK HEAD TAPPING SCREWS
Steel Nickel Plated



133 CROSS RECESSED PAN HEAD TAPPING SCREW
Steel Zinc Plated and Steel Nickel Plated



133 SLOTTED PAN HEAD TAPPING SCREWS
Steel Zinc Plated and Steel Nickel Plated



134 CROSS RECESSED PAN HEAD TAPPING SCREW
Steel Zinc Plated, Black Passivated



134 CROSS RECESSED PAN HEAD TAPPING SCREW
Steel Zinc Plated



134 CROSS RECESSED PAN HEAD TAPPING SCREW
Steel Nickel Plated



135 CROSS RECESSED COUNTERSUNK HEAD TAPPING SCREW
Steel Zinc Plated



135 CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW
Steel Zinc Plated



135 CROSS RECESSED COUNTERSUNK HEAD TAPPING SCREW
Steel Zinc Plated and Steel Nickel Plated



136 CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW
Steel Zinc Plated, BLACK Passivated



136 CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW
Steel Zinc Plated and Steel Nickel Plated



137 HEXALOBULAR PAN HEAD TAPPING SCREWS
Steel Zinc Plated



CONTENTS

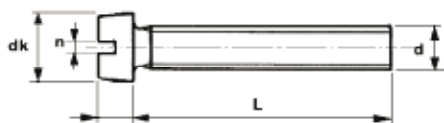
137	HEXALOBULAR COUNTERSUNK HEAD TAPPING SCREWS Steel Zinc Plated	
137	HEXAGON HEAD TAPPING SCREWS with CONE END Steel Zinc Plated	
138	HEXAGON HEAD TAPPING SCREWS with FLAT END Steel Zinc Plated	
138	SLOTTED HEXAGON WASHER HEAD TAPPING SCREWS Steel Zinc Plated	
138	SEMA - HEXAGON WASHER HEAD TAPPING SCREWS Steel Zinc Plated	
139	ROOF and FRONT BOLTS with ELASTOMER SEALING RING Type A - Stainless Steel A2	
139	ROOF and FRONT BOLTS with ELASTOMER SEALING RING Type B - Stainless Steel A2	
139	SEALING RINGS - Stainless Steel A2 / ELASTOMER	
140	CROSS RECESSED MUSHROOM HEAD SCREWS with FLANGE Steel Zinc Plated, Black Passivated	
140	DRIVE SCREWS - Steel Nickel Plated	
141	SELF-DRILLING SCREWS	
142	SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Aluminium	
142	SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS With SR-RECESS - Steel Zinc Plated	
143	SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Steel Zinc Plated	
143	SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Stainless Steel A2	
144	SELF-DRILLING CROSS RECESSED COUNTERSUNK HEAD SCREWS Steel Zinc Plated	
144	STAINLESS STEEL A2	
144	SELF-DRILLING COUNTERSUNK SCREWS with SR-RECESS Steel Zinc Plated	
145	SELF-DRILLING HEXAGON HEAD SCREWS with COLLAR Steel Zinc Plated	
145	SELF-DRILLING HEXAGON HEAD SCREWS with COLLAR STAINLESS STEEL - A2	

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146	SELF-DRILLING CROSS RECESSED SCREWS with WINGS Steel Zinc Plated	
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146	SELF-DRILLING TORX COUNTERSUNK HEAD SCREWS with WINGS Steel Zinc Plated	
147	CHIPBOARD SCREWS	
148	SLOTTED COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated	
148	CROSS RECESSED RAISED CHEESE HEAD SCREWS for CHIPBOARD Steel Zinc Plated	
148	CROSS RECESSED COUNTERSUNK SCREWS with HOLE for CHIPBOARD Steel Zinc Plated	
149	CROSS RECESS COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated and Zinc Plated, Yellow Passivated	
149	COVERS for CROSS RECESS COUNTERSUNK SCREWS with HOLE For CHIPBOARD - Plastic	
150	HEXABULAR COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated	
150	VBA/PLUS - CROSS RECESS RAISED CHEESE SCREWS for CHIPBOARD Steel Zinc Plated	
150	VBA/PLUS - CROSS RECESS COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated	

SCREWS

SLOTTED CHEESE HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel



ISO	:	1207
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NEN	:	1602
ANSI	:	B18.6.7M
BS	:	7635
NF	:	E25-127

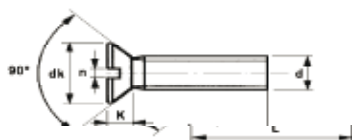


d	M2	M2.5	M3	M3.5	M4
P	0.4	0.45	0.5	0.6	0.7
dk	3.8	4.5	5.5	6	7
k	1.3	1.6	2	2.4	2.6
n	0.5	0.6	0.8	1	1.2

d	M5	M6	M8	M10	M12
P	0.8	1	1.25	1.5	1.75
dk	8.5	10	13	16	18
k	3.3	3.9	5	6	7
n	1.2	1.6	2	2.5	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M2 x 4	M2.5 x 12	M3 x 35	M3.5 x 40	M4 x 50	M5 x 45	M6 x 45	M8 x 45	M10 x 70
M2 x 5	M2.5 x 16	M3 x 40	M3.5 x 50	M4 x 60	M5 x 50	M6 x 50	M8 x 50	M10 x 80
M2 x 6	M2.5 x 20	M3 x 45		M4 x 70	M5 x 60	M6 x 60	M8 x 60	M10 x 100
M2 x 8	M2.5 x 25	M3 x 50	M4 x 5	M4 x 80	M5 x 70	M6 x 70	M8 x 70	
M2 x 10	M2.5 x 30	M3 x 60	M4 x 6		M5 x 80	M6 x 80	M8 x 80	M12 x 20
M2 x 12		M3 x 70	M4 x 8	M5 x 6	M5 x 100	M6 x 90	M8 x 100	M12 x 25
M2 x 16	M3 x 4		M4 x 10	M5 x 8		M6 x 100		M12 x 30
M2 x 20	M3 x 5	M3.5 x 6	M4 x 12	M5 x 10	M6 x 8		M10 x 16	M12 x 35
M2 x 25	M3 x 6	M3.5 x 8	M4 x 16	M5 x 12	M6 x 10	M8 x 10	M10 x 20	M12 x 40
M2 x 30	M3 x 8	M3.5 x 10	M4 x 18	M5 x 16	M6 x 12	M8 x 12	M10 x 25	M12 x 50
	M3 x 10	M3.5 x 12	M4 x 20	M5 x 18	M6 x 16	M8 x 16	M10 x 30	M12 x 60
M2.5 x 4	M3 x 12	M3.5 x 16	M4 x 25	M5 x 20	M6 x 20	M8 x 20	M10 x 35	M12 x 70
M2.5 x 5	M3 x 16	M3.5 x 20	M4 x 30	M5 x 25	M6 x 25	M8 x 25	M10 x 40	M12 x 80
M2.5 x 6	M3 x 20	M3.5 x 25	M4 x 35	M5 x 30	M6 x 30	M8 x 30	M10 x 45	M12 x 100
M2.5 x 8	M3 x 25	M3.5 x 30	M4 x 40	M5 x 35	M6 x 35	M8 x 35	M10 x 50	
M2.5 x 10	M3 x 30	M3.5 x 35	M4 x 45	M5 x 40	M6 x 40	M8 x 40	M10 x 60	

SLOTTED COUNTERSUNK HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel



ISO	:	2009
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NEN	:	2370
ANSI	:	B18.6.7M
BS	:	4183
NF	:	E25-123



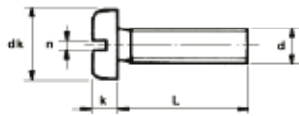
d	M2	M2.5	M3	M3.5	M4	M5
P	0.4	0.45	0.5	0.6	0.7	0.8
dk	3.8	4.7	5.6	6.5	7.5	9.2
k (max)	1.2	1.5	1.65	1.93	2.2	2.5
n	0.5	0.6	0.8	0.8	1	1.2

d	M6	M8	M10	M12	M16	M20
P	1	1.25	1.5	1.75	2	2.5
dk	11	14.5	18	22	29	36
k (max)	3	4	5	6	8	10
n	1.6	2	2.5	3	4	5

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M2 x 4	M2.5 x 20	M3 x 60	M4 x 10	M5 x 12	M6 x 16	M8 x 20	M10 x 45	M16 x 30
M2 x 5	M2.5 x 25	M3 x 70	M4 x 12	M5 x 16	M6 x 18	M8 x 25	M10 x 50	M16 x 35
M2 x 6	M2.5 x 30	M3 x 75	M4 x 16	M5 x 20	M6 x 20	M8 x 30	M10 x 60	M16 x 40
M2 x 8		M3 x 80	M4 x 20	M5 x 25	M6 x 25	M8 x 35	M10 x 70	M16 x 45
M2 x 10	M3 x 4	M3 x 100	M4 x 25	M5 x 30	M6 x 30	M8 x 40	M10 x 80	M16 x 50
M2 x 12	M3 x 5		M4 x 30	M5 x 35	M6 x 35	M8 x 45	M10 x 100	M16 x 60
M2 x 16	M3 x 6	M3.5 x 6	M4 x 35	M5 x 40	M6 x 40	M8 x 50		M16 x 70
M2 x 20	M3 x 8	M3.5 x 8	M4 x 40	M5 x 45	M6 x 45	M8 x 60	M12 x 20	M16 x 80
M2 x 25	M3 x 10	M3.5 x 10	M4 x 45	M5 x 50	M6 x 50	M8 x 70	M12 x 25	M16 x 90
M2 x 30	M3 x 12	M3.5 x 12	M4 x 50	M5 x 55	M6 x 60	M8 x 80	M12 x 30	M16 x 100
	M3 x 16	M3.5 x 16	M4 x 60	M5 x 60	M6 x 70	M8 x 100	M12 x 35	
M2.5 x 4	M3 x 20	M3.5 x 20	M4 x 70	M5 x 70	M6 x 80		M12 x 40	M20 x 40
M2.5 x 5	M3 x 25	M3.5 x 25	M4 x 80	M5 x 80	M6 x 90	M10 x 16	M12 x 50	M20 x 50
M2.5 x 6	M3 x 30	M3.5 x 30	M4 x 100	M5 x 90	M6 x 100	M10 x 20	M12 x 60	M20 x 60
M2.5 x 8	M3 x 35	M3.5 x 35		M5 x 100		M10 x 25	M12 x 70	M20 x 70
M2.5 x 10	M3 x 40	M3.5 x 40	M5 x 6		M8 x 10	M10 x 30	M12 x 80	M20 x 80
M2.5 x 12	M3 x 45		M5 x 8	M6 x 8	M8 x 12	M10 x 35	M12 x 100	M20 x 100
M2.5 x 16	M3 x 50	M4 x 6	M5 x 10	M6 x 10	M8 x 16	M10 x 40		M20 x 140
		M4 x 8		M6 x 12				

SCREWS

SLOTTED PAN HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel



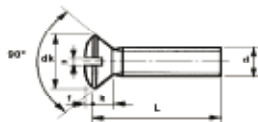
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ANSI	:	B18.6.7M
BS	:	4183
NF	:	E25-128



d	M3	M3.5	M4	M5	M6	M8
P	0.5	0.6	0.7	0.8	1	1.25
dk	6	7	8	10	12	16
k (max)	1.8	2.1	2.4	3	3.6	4.8
n	0.8	1	1.2	1.2	1.6	2

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M3 x 25	M4 x 5	M4 x 20	M5 x 6	M5 x 25	M6 x 8	M6 x 20	M8 x 16
M3 x 8	M3 x 30	M4 x 6	M4 x 25	M5 x 8	M5 x 30	M6 x 10	M6 x 25	M8 x 20
M3 x 10	M3 x 40	M4 x 8	M4 x 30	M5 x 10	M5 x 40	M6 x 12	M6 x 30	M8 x 25
M3 x 12		M4 x 10	M4 x 35	M5 x 12	M5 x 50	M6 x 16	M6 x 40	
M3 x 16	M3.5 x 12	M4 x 12	M4 x 40	M5 x 16	M5 x 60	M6 x 18	M6 x 50	
M3 x 20		M4 x 16		M5 x 20				

SLOTTED RAISED COUNTERSUNK HEAD SCREWS - Steel Zinc Plated and Yellow Passivated - Full Threaded Steel



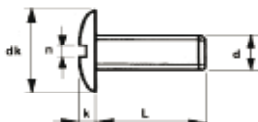
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NEN	:	2371
ANSI	:	B18.6.7M
BS	:	4183
NF	:	E25-124



d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
dk	5.6	7.5	9.2	11	14.5
k (max)	1.65	2.2	2.5	3	4
f =	0.75	1	1.25	1.5	2
n	0.8	1	1.2	1.6	2

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M3 x 25	M4 x 10	M4 x 40	M5 x 12	M5 x 40	M6 x 12	M6 x 40	M8 x 25
M3 x 8	M3 x 30	M4 x 12	M4 x 50	M5 x 16	M5 x 45	M6 x 16	M6 x 50	M8 x 30
M3 x 10	M3 x 40	M4 x 16	M4 x 60	M5 x 20	M5 x 50	M6 x 20	M6 x 60	M8 x 40
M3 x 12		M4 x 20		M5 x 25	M5 x 60	M6 x 25		M8 x 50
M3 x 16	M4 x 6	M4 x 25	M5 x 8	M5 x 30		M6 x 30	M8 x 16	M8 x 60
M3 x 20	M4 x 8	M4 x 30	M5 x 10	M5 x 35	M6 x 10	M6 x 35	M8 x 20	

SLOTTED MUSHROOM HEAD SCREWS - Steel Zinc Plated



ISO	:	
DIN	:	
NEN	:	
ANSI	:	
BS	:	
NF	:	

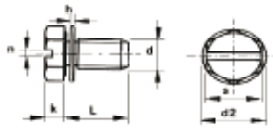


d	M5	M6
P	0.8	1
dk	10	12
k	3	3.6
n	1.2	1.6

SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
M5 x 6	M5 x 10	M5 x 12	M5 x 16	M6 x 12

SCREWS

SLOTTED SCREW and WASHER ASSEMBLYS with PLAIN WASHER Steel Zinc Plated, Yellow Passivated



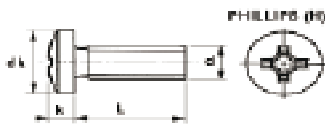
ISO	:	
DIN	:	6900
NEN	:	2371
ANSI	:	
BS	:	
NF	:	



d	M4	M5	M6
P	0.7	0.8	1
k	2.8	3.5	4
n	1.2	1.2	1.6
s	7	8	10
d2	8	10	12
h	0.8	1	1.2

SIZE AVAILABLE					
d x L		d x L		d x L	
M4 x 10	M4 x 16	M5 x 12	M5 x 18	M6 x 12	M6 x 18

CROSS RECESSED PAN HEAD SCREWS Steel Zinc Plated, Yellow and Black Passivated



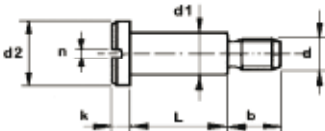
ISO	:	7045
DIN	:	7985
NEN	:	
ANSI	:	
BS	:	
NF	:	



d	M2	M2.5	M3	M4	M5	M6	M8	M10
P	0.4	0.45	0.5	0.7	0.8	1	1.25	1.50
dk	4	5	6	8	10	12	16	20
K	1.6	2	2.4	3.1	3.8	4.6	6	7.5
nr Phillips (H) recess	1	1	1	2	2	3	4	4

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M2 x 4	M2.5 x 8	M3 x 12	M4 x 8	M4 x 45	M5 x 30	M6 x 12	M6 x 60	M8 x 45
M2 x 5	M2.5 x 10	M3 x 16	M4 x 10	M4 x 50	M5 x 35	M6 x 16		M8 x 50
M2 x 6	M2.5 x 12	M3 x 20	M4 x 12		M5 x 40	M6 x 20	M8 x 12	M8 x 60
M2 x 8		M3 x 25	M4 x 16	M5 x 8	M5 x 45	M6 x 25	M8 x 16	
M2 x 10	M3 x 4	M3 x 30	M4 x 20	M5 x 10	M5 x 50	M6 x 30	M8 x 20	M10 x 25
	M3 x 5	M3 x 40	M4 x 25	M5 x 12	M5 x 60	M6 x 35	M8 x 25	M10 x 30
M2.5 x 4	M3 x 6		M4 x 30	M5 x 16		M6 x 40	M8 x 30	M10 x 40
M2.5 x 5	M3 x 8	M4 x 5	M4 x 35	M5 x 20	M6 x 8	M6 x 45	M8 x 35	M10 x 50
M2.5 x 6	M3 x 10	M4 x 6	M4 x 40	M5 x 25	M6 x 10	M6 x 50	M8 x 40	M10 x 60

CROSS RECESSED PAN HEAD SCREWS Steel Zinc Plated, Yellow and Black Passivated



ISO	:	
DIN	:	923
NEN	:	
ANSI	:	
BS	:	
NF	:	

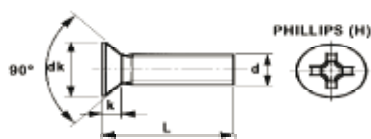


d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
b	4.5	6	7	9	11
d2 (max)	7	8.5	11	13	16
d1 (n9)	4	5.5	7	8	10
k	1.8	2.4	2.7	3.1	3.8
n	0.8	1	1.2	1.6	2

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 8	M4 x 6	M4 x 12	M5 x 6	M5 x 16	M6 x 8	M6 x 16	M8 x 8	M8 x 16
M3 x 10	M4 x 8	M4 x 16	M5 x 8	M5 x 20	M6 x 10	M6 x 16	M8 x 10	M8 x 20
M3 x 12	M4 x 10		M5 x 12	M5 x 25	M6 x 12	M6 x 16	M8 x 12	M8 x 25

SCREWS

CROSS RECESSED COUNTER HEAD SCREWS Steel Zinc Plated and Zinc Plated, Black Passivated



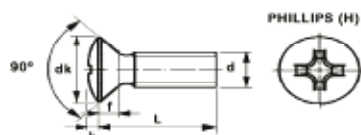
ISO	:	1207
DIN	:	84
NEN	:	1602
ANSI	:	B18.6.7M
BS	:	7635
NF	:	E25-127



d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
dk	5.6	7.5	9.2	11	14.5
K (max)	1.65	2.2	2.5	3	4
nr Phillips (H) recess	1	2	2	3	4

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M3 x 20	M4 x 12	M5 x 8	M5 x 25	M6 x 10	M6 x 25	M8 x 12	M8 x 35
M3 x 8		M4 x 16	M5 x 10	M5 x 30	M6 x 12	M6 x 30	M8 x 16	M8 x 40
M3 x 10	M4 x 6	M4 x 20	M5 x 12	M5 x 35	M6 x 16	M6 x 35	M8 x 20	M8 x 45
M3 x 12	M4 x 8	M4 x 25	M5 x 16	M5 x 40	M6 x 20	M6 x 40	M8 x 25	M8 x 50
M3 x 16	M4 x 10	M4 x 30	M5 x 20	M5 x 50		M6 x 50	M8 x 30	

CROSS RECESSED COUNTER HEAD SCREWS Steel Zinc Plated and Zinc Plated, Black Passivated



ISO	:	7045
DIN	:	7985
NEN	:	
ANSI	:	
BS	:	
NF	:	



d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
dk	5.6	7.5	9.2	11	14.5
K (max)	1.65	2.2	2.5	3	4
f =	0.75	1	1.25	1.5	2
nr Phillips (H) recess	1	2	2	3	4

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M4 x 6	M4 x 25	M5 x 8	M5 x 25	M6 x 10	M6 x 30	M8 x 16	M8 x 35
M3 x 8	M4 x 8	M4 x 30	M5 x 10	M5 x 30	M6 x 12	M6 x 35	M8 x 20	M8 x 40
M3 x 10	M4 x 10	M4 x 40	M5 x 12	M5 x 35	M6 x 16	M6 x 40	M8 x 25	M8 x 50
M3 x 12	M4 x 12		M5 x 16	M5 x 40	M6 x 20	M6 x 50	M8 x 30	
M3 x 16	M4 x 16		M5 x 20	M5 x 50	M6 x 25			

HEXALOBULAR PAN HEAD SCREWS Steel Zinc Plated



ISO	:	
DIN	:	923
NEN	:	
ANSI	:	
BS	:	
NF	:	

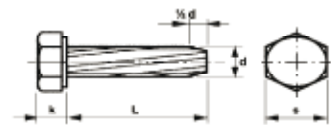


d	M4	M5	M6
P	0.7	0.8	1
dk	8	10	12
K	3.1	3.8	4.6
Nr Tork bit	TX20	TX25	TX30

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M4 x 8	M4 x 12	M4 x 20	M5 x 8	M5 x 12	M5 x 20	M6 x 10	M6 x 16	M6 x 20
M4 x 10	M4 x 16		M5 x 10	M5 x 16		M6 x 12		

SCREWS

HEXAGON HEAD THREAD CUTTING SCREWS Steel Zinc Plated



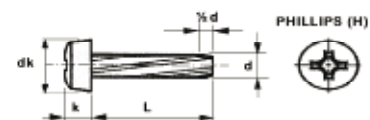
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DIN	:	7513 A (933)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M5	M6	M8
P	0.8	1	1.25
k	3.5	4	5.3
s	8	10	13
Drill Ø	4.5	5.5	7.4

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M5 x 10	M5 x 16	M5 x 25	M6 x 12	M6 x 20	M6 x 30	M8 x 16	M8 x 25	M8 x 35
M5 x 12	M5 x 20		M6 x 16	M6 x 25	M6 x 35	M8 x 20	M8 x 30	M8 x 40

CROSS RECESSED RAISED CHEESE HEAD TREAD CUTTING SCREW - Steel Zinc Plated



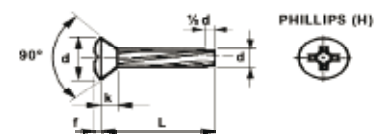
ISO	:	-
DIN	:	7516 A (7985)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M3	M4	M5	M6
P	0.5	0.7	0.8	1
dk	6	8	10	12
K	2.4	3.1	3.8	4.6
Nr Phillips (H)	1	2	2	3
Drill Ø	2.7	3.6	4.5	5.5

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M3 x 12	M4 x 8	M4 x 16	M5 x 10	M5 x 16	M5 x 30	M6 x 16	M6 x 30
M3 x 8	M3 x 16	M4 x 10	M4 x 20	M5 x 12	M5 x 20		M6 x 20	M6 x 35
M3 x 10		M4 x 12	M4 x 25		M5 x 25	M6 x 12	M6 x 25	

CROSS RECESSED RAISED COUNTERSUNK HEAD THREAD CUTTING SCREWS - Steel Zinc Plated



ISO	:	-
DIN	:	7516 E (966)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

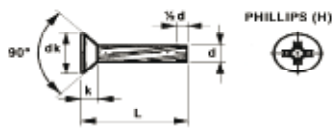


d	M3	M4	M5	M6
P	0.5	0.7	0.8	1
dk	5.6	7.5	9.2	11
k (max)	1.65	2.2	2.5	3
f =	0.75	1	1.25	1.5
Phillips (H)	1	2	2	3
Drill Ø	2.7	3.6	4.5	5.5

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 10	M3 x 16	M4 x 10	M4 x 20	M5 x 12	M5 x 25	M6 x 16	M6 x 25	M6 x 35
M3 x 12	M3 x 20	M4 x 12	M4 x 25	M5 x 16	M5 x 30	M6 x 20	M6 x 30	
		M4 x 16		M5 x 20				

SCREWS

CROSS RECESSED RAISED CHEESE HEAD TREAD CUTTING SCREW - Steel Zinc Plated



ISO	:	-
DIN	:	7516 D (965)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

d	M3	M4	M5	M6
P	0.5	0.7	0.8	1
dk	5.6	7.5	9.200	11
K (max)	1.65	2.2	2.5	3
Nr Phillips (H)	1	2	2	3
Drill Ø	2.7	3.6	4.5	5.5

SIZE AVAILABLE		
d x L	d x L	d x L
M3 x 10	M4 x 25	M6 x 16
M3 x 12	M4 x 30	M6 x 20
M3 x 16		M6 x 25
M3 x 20	M5 x 10	M6 x 30
	M5 x 12	M6 x 35
M4 x 10	M5 x 16	M6 x 40
M4 x 12	M5 x 20	
M4 x 16	M5 x 25	
M4 x 20	M5 x 30	

SCREWS

TAPTITE THREAD FORMING BOLTS and SCREWS

General TAPTITE: Thread forming bolts and screws form their own mating internal thread in a predrilled or punched core hole without removal of any material (chipless) by means of a special triangular shape of thread. Thus, no threadtapping and no disturbing, sometimes unacceptable chips.

Application: TAPTITE thread forming bolts and screws are applicable in all ductile materials such as steel, aluminum and non-ferrous metals etc. up to 150HB/500 N/mm².

Forces: the TAPTITE thread forming bolts and screws connection can carry considerably higher forces due to the cold deformation of the materials, the uninterrupted continuous grain flow and full thread engagement. Usually a smaller size screw can be used than with conventional thread. Thus lighter designing.

Locking: the connection is self locking, this is due to the full-form thread and clamping on the flanks. This eliminates the extra use of locking parts.

Threads: standard ISO-metric screw thread is formed with the TAPTITE thread forming bolts and screws in which other metric fastener with the usual 6h-fit can be screwed.

Recess: most of the TAPTITE thread forming screws are provided with a Pozidriv cross recess and so adapted to the requirement of efficiency in the modern, mechanized mass-production.

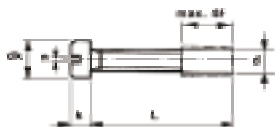
Material: TAPTITE thread forming bolts and screws are made from case hardened steel and are surface hardened (min. 450HV 0.3) while the core remains tough (240-390 HV 0.3)



Guide values for TAPTITE thread forming screws						
d	M3	M3.5	M4	M5	M6	M8
Thread forming torque	0.5	0.9	1.3	2.5	6	13
Tightening torque max. in Nm	1.5	2.5	3.5	7	12	20
Breaking torque min. in Nm	2	3.3	4.8	10	16	41

SCREWS

TAPTITE - SLOTTED CHEESE HEAD THREAD FORMING SCREWS Steel Zinc Plated



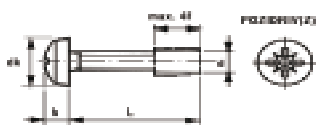
ISO	:	-
DIN	:	7500 A (84)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M3	M4	M5
P	0.5	0.7	0.8
dk	5.5	7	8.5
k	2	2.6	3.3
n	.0.8	1.2	2

SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
M3 x 10	M4 x 8	M4 x 16	M4 x 25	M5 x 20
M3 x 12	M4 x 10	M4 x 20	M4 x 30	

TAPTITE - CROSS RECESSED RAISED CHEESE HEAD THREAD FORMING SCREWS - Steel Zinc Plated



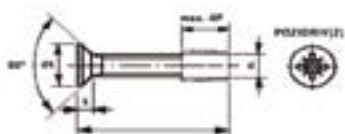
ISO	:	-
DIN	:	7500 C (7985)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M3	M3.5	M4	M5	M6
P	0.5	0.6	0.7	0.8	1
dk	6	7	8	10	12
k	2.4	2.7	3.1	3.8	4.6
Nr. Pozidriv (Z) recess	1	2	2	2	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 6	M3 x 16	M3.5 x 12	M4 x 6	M4 x 16	M5 x 8	M5 x 12	M5 x 30	M6 x 16
M3 x 8	M3 x 20	M3.5 x 16	M4 x 8	M4 x 20	M5 x 10	M5 x 16		M6 x 20
M3 x 10	M3 x 25		M4 x 10	M4 x 25		M5 x 20	M6 x 10	M6 x 30
M3 x 12	M3.5 x 8		M4 x 12	M4 x 30		M5 x 25	M6 x 12	

TAPTITE - CROSS RECESSED COUNTERSUNK HEAD THREAD FORMING SCREWS - Steel Zinc Plated



ISO	:	-
DIN	:	7500 M (965)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

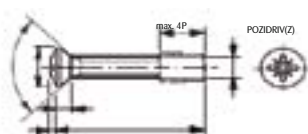


d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
dk	5.6	7.5	9.2	11	14.5
k (max)	1.65	2.2	2.5	3	4
Nr. Pozidriv (Z) recess	1	2	2	3	4

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 8	M3 x 16	M4 x 12	M4 x 25	M5 x 10	M5 x 20	M6 x 16	M6 x 30	M8 x 40
M3 x 10		M4 x 16		M5 x 12	M5 x 25	M6 x 20	M6 x 40	
M3 x 12	M4 x 10	M4 x 20		M5 x 16	M5 x 30	M6 x 25		

SCREWS

TAPTITE- CROSS RECESSED RAISED COUNTERSUNK HEAD THREAD FORMING SCREWS - Steel Zinc Plated



ISO	:	-
DIN	:	7500 N (966)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M3	M4	M5	M6
P	0.5	0.7	0.8	1
dk	5.6	7.5	9.2	12
k (max)	1.65	2.2	2.5	4.6
f =	0.75	1	1.25	
	1	2	2	3

SIZE AVAILABLE					
d x L	d x L	d x L	d x L	d x L	d x L
M3 x 16	M4 x 10	M4 x 12	M4 x 20	M5 x 12	M5 x 16

TAPTITE - HEXAGON HEAD THREAD FORMING SCREWS Steel Zinc Plated



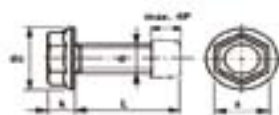
ISO	:	-
DIN	:	7500 D (933)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	M3	M4
P	0.5	0.7
dk	2	2.8
s	5.5	7

SIZE AVAILABLE			
d x L	d x L	d x L	d x L
M3 x 8	M3 x 30	M4 x 12	M4 x 30

TAPTITE - HEXAGON HEAD THREAD FORMING SCREWS with FLANGE Steel Zinc Plated



ISO	:	-
DIN	:	7500
NEN -	:	-
ANSI	:	-
BS	:	-
NF	:	-

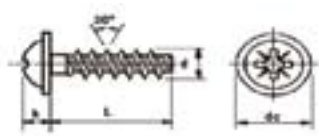


d	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
k (max)	2.58	3.58	4.45	5.2	7
s	5.5	7	8	10	13
dc (max)	6.9	8.9	10.4	13	17

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
M3 x 8	M4 x 6	M4 x 12	M5 x 8	M5 x 16	M6 x 10	M6 x 16	M6 x 30	M8 x 16
M3 x 10	M4 x 8	M4 x 16	M5 x 10	M5 x 20	M6 x 12	M6 x 20		M8 x 20
	M4 x 10	M4 x 30	M5 x 12	M5 x 25		M6 x 25		M8 x 25

SCREWS

EJOT PT - CROSS RECESSED THREAD FORMING MUSHROOM HEAD SCREWS - Steel Zinc Plated



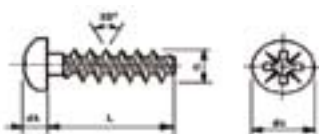
ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



Type	KB 30	KB 35	KB 40
d	3	3.5	4
P	1.34	1.57	1.79
dc	6	7	8
k	2.1	2.4	2.5
Nr. Pozidriv (z) recess	1	2	2

SIZE AVAILABLE						
Type x L	Type x L	Type x L	Type x L	Type x L	Type x L	Type x L
KB 30 x 8	KB 30 x 10	KB 35 x 12	KB 35 x 16	KB 35 x 20	KB x 40 x 10	KB x 40 x 12

EJOT PT - CROSS RECESSED THREAD FORMING RAISED CHEESE HEAD SCREWS - Steel Zinc Plated



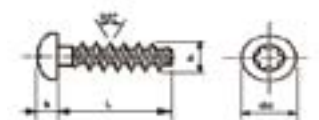
ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



Type	KB 22	KB 25	KB 30	KB 35	KB 40	KB 50	KB 60
d	2.2	2.5	3	3.5	4	5	6
P	0.98	1.12	1.34	1.57	1.79	2.24	2.69
dk	3.9	4.4	5.3	6.1	7	8.8	10.5
k	1.5	1.7	2	2.5	2.7	3.4	4
Nr. Pozidriv (Z) recess	1	1	1	2	2	2	3

SIZE AVAILABLE								
Type x L	Type x L	Type x L	Type x L	Type x L	Type x L	Type x L	Type x L	Type x L
KB 22 x 6	KB 25 x 6	KB 25 x 12	KB 30 x 8	KB 30 x 16	KB 35 x 10	KB 40 x 10	KB 40 x 16	KB 50 x 20
KB 22 x 8	KB 25 x 8	KB 25 x 16	KB 30 x 10	KB 30 x 20	KB 35 x 12	KB 40 x 12	KB 40 x 20	KB 50 x 25
KB 22 x 10	KB 25 x 10		KB 30 x 12		KB 35 x 16	KB 40 x 14		
		KB 30 x 6					KB 50 x 16	KB 60 x 20

EJOT PT - TORX THREAD FORMING RAISED CHEESE HEAD SCREWS - Steel Zinc Plated



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -

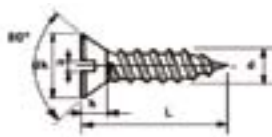


Type	K 30	K 40
d	3	4
P	1.34	1.79
dc	5.6	7.5
k	2.1	2.6
Nr. Torx bit	TX 10	TX 20

SIZE AVAILABLE					
Type x L	Type x L	Type x L	Type x L	Type x L	Type x L
K 30 x 8	K 30 x 10	K 40 x 12	K 40 x 14	K 40 x 16	K 40 x 20

SCREWS

SLOTTED COUNTERSUNK HEAD TAPPING SCREWS Steel Zinc Plated and Steel Nickel Plated



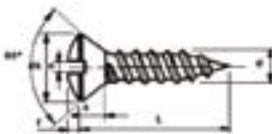
ISO : 1580
DIN : 85
NEN : 1603
ANSI : B18.6.7M
BS : 4183
NF : E25-128



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.5	6.8	7.5	8.2	9.5	10.8	12.4
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
n	0.8	1	1	1.2	1.2	1.6	1.6
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 6.5mm	ST3.5 x 32mm	ST3.9 x 22mm	ST4.2 x 16mm	ST4.2 x 50mm	ST4.8 x 32mm	ST5.5 x 19mm	ST6.3 x 16mm
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 25mm	ST4.2 x 19mm		ST4.8 x 38mm	ST5.5 x 25mm	ST6.3 x 19mm
ST2.9 x 13mm	ST3.5 x 13mm		ST3.9 x 32mm	ST4.2 x 22mm	ST4.8 x 9.5mm	ST4.8 x 45mm	ST5.5 x 32mm	ST6.3 x 25mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 9.5mm	ST3.9 x 38mm	ST4.2 x 25mm	ST4.8 x 13mm	ST4.8 x 50mm	ST5.5 x 38mm	ST6.3 x 32mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 13mm		ST4.2 x 32mm	ST4.8 x 16mm		ST5.5 x 45mm	ST6.3 x 38mm
ST2.9 x 25mm	ST3.5 x 22mm	ST3.9 x 16mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 19mm	ST5.5 x 13mm	ST5.5 x 50mm	ST6.3 x 45mm
	ST3.5 x 25mm	ST3.9 x 19mm	ST4.2 x 13mm	ST4.2 x 45mm	ST4.8 x 25mm	ST5.5 x 16mm	ST6.3 x 13mm	ST6.3 x 50mm

SLOTTED RAISED COUNTERSUNK HEAD TAPPING SCREWS Steel Zinc Plated and Steel Nickel Plated



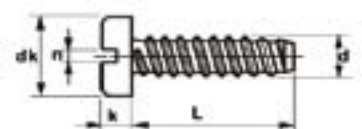
ISO : 2010
DIN : 964
NEN : 2371
ANSI : B18.6.7M
BS : 4183
NF : E25-124



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.5	6.8	7.5	8.1	9.5	10.8	12.4
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
f =	0.9	1.2	1.3	1.4	1.5	1.7	2
n	0.8	1	1	1.2	1.2	1.6	1.6
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 32mm	ST4.2 x 19mm	ST4.8 x 9.5mm	ST4.8 x 45mm	ST5.5 x 25mm	ST6.3 x 16mm
ST2.9 x 9.5mm	ST3.5 x 13mm		ST3.9 x 38mm	ST4.2 x 25mm	ST4.8 x 13mm	ST4.8 x 50mm	ST5.5 x 32mm	ST6.3 x 19mm
ST2.9 x 13mm	ST3.5 x 16mm	ST3.9 x 9.5mm		ST4.2 x 32mm	ST4.8 x 16mm		ST5.5 x 38mm	ST6.3 x 25mm
ST2.9 x 16mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 19mm	ST5.5 x 13mm	ST5.5 x 45mm	ST6.3 x 32mm
ST2.9 x 19mm	ST3.5 x 25mm	ST3.9 x 16mm	ST4.2 x 13mm	ST4.2 x 45mm	ST4.8 x 25mm	ST5.5 x 16mm	ST5.5 x 50mm	ST6.3 x 38mm
ST2.9 x 25mm	ST3.5 x 32mm	ST3.9 x 19mm	ST4.2 x 16mm	ST4.2 x 50mm	ST4.8 x 32mm	ST5.5 x 19mm		ST6.3 x 45mm
		ST3.9 x 25mm			ST4.8 x 38mm		ST6.3 x 13mm	ST6.3 x 50mm

SLOTTED PAN HEAD TAPPING SCREWS Steel Zinc Plated and Steel Nickel Plated



ISO :
DIN :
NEN :
ANSI :
BS :
NF :

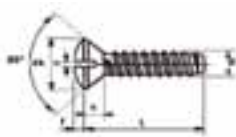


d	ST2.2	ST2.9	ST4.2
P	0.8	1.1	1.4
dk	4.2	5.6	8.2
k =	1.35	1.75	2.45
n	0.6	0.8	1.2
Nr. Acc. to ISO	2	4	8

SIZE AVAILABLE					
d x L	d x L	d x L	d x L	d x L	d x L
ST2.2 x 4.5mm	ST2.2 x 6.5mm	ST2.2 x 8mm	ST2.2 x 9.5mm	ST2.9 x 6.5mm	ST4.2 x 13mm

SCREWS

SLOTTED RAISED COUNTERSUNK HEAD TAPPING SCREWS Steel Nickel Plated



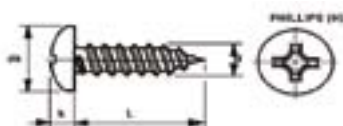
ISO : -
DIN : 7973 F
NEN : -
ANSI : -
BS : 4174
NF : E25-661 F



d	ST2.2
P	0.8
dk	4.2
k =	1.3
f =	0.7
n	0.6
Nr. Acc. to ISO	2

SIZE AVAILABLE		
d x L	d x L	d x L
ST2.2 x 6.5mm	ST2.2 x 8mm	ST2.2 x 9.5mm

CROSS RECESSED PAN HEAD TAPPING SCREW Steel Zinc Plated and Steel Nickel Plated



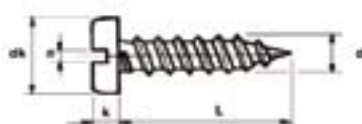
ISO : 7049 CH
DIN : 7981 CH
NEN : -
ANSI : -
BS : -
NF : -



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.9	7.5	8.2	9.5	10.8	12.5
k	2.2	2.6	2.8	3.05	3.55	3.95	4.55
Nr. Phillips (H) recess	1	2	2	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 6.5mm	ST3.5 x 32mm	ST3.9 x 22mm	ST4.2 x 22mm	ST4.8 x 19mm	ST4.8 x 45mm	ST5.5 x 32mm	ST6.3 x 19mm
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 25mm	ST4.2 x 25mm	ST4.8 x 22mm	ST4.8 x 50mm	ST5.5 x 38mm	ST6.3 x 22mm
ST2.9 x 13mm	ST3.5 x 13mm			ST4.2 x 32mm	ST4.8 x 25mm		ST5.5 x 45mm	ST6.3 x 25mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 9.5mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 32mm	ST5.5 x 13mm	ST5.5 x 50mm	ST6.3 x 32mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 13mm		ST4.8 x 38mm	ST5.5 x 16mm		ST6.3 x 38mm
ST2.9 x 22mm	ST3.5 x 22mm	ST3.9 x 16mm	ST4.2 x 16mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 19mm	ST6.3 x 13mm	ST6.3 x 45mm
ST2.9 x 25mm	ST3.5 x 25mm	ST3.9 x 19mm	ST4.2 x 19mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 22mm	ST6.3 x 16mm	ST6.3 x 50mm
						ST5.5 x 25mm		

SLOTTED PAN HEAD TAPPING SCREWS Steel Zinc Plated and Steel Nickel Plated



ISO : 1481
DIN : 7971 C
NEN : -
ANSI : -
BS : 4174
NF : E25-663 C

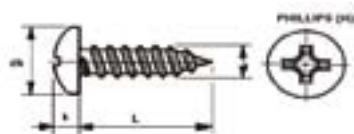


d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.9	7.5	8.2	9.5	10.8	12.5
k	1.75	2.1	2.25	2.45	2.8	3.2	3.65
n	0.8	1	1	1.2	1.2	1.6	1.6
Nr. Acc. to ISO	4	6	7	8	10	1.2	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 6.5mm	ST3.5 x 32mm	ST3.9 x 25mm	ST4.2 x 22mm	ST4.8 x 9.5mm	ST4.8 x 32mm	ST5.5 x 22mm	ST6.3 x 13mm
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 32mm	ST4.2 x 25mm	ST4.8 x 13mm	ST4.8 x 38mm	ST5.5 x 25mm	ST6.3 x 16mm
ST2.9 x 13mm	ST3.5 x 13mm		ST3.9 x 38mm	ST4.2 x 32mm	ST4.8 x 16mm	ST4.8 x 45mm	ST5.5 x 32mm	ST6.3 x 19mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 9.5mm		ST4.2 x 38mm	ST4.8 x 19mm	ST4.8 x 50mm	ST5.5 x 38mm	ST6.3 x 25mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 9.5mm	ST4.2 x 45mm	ST4.8 x 22mm		ST5.5 x 45mm	ST6.3 x 32mm
ST2.9 x 22mm	ST3.5 x 22mm	ST3.9 x 16mm	ST4.2 x 13mm	ST4.2 x 50mm	ST4.8 x 25mm	ST5.5 x 13mm	ST5.5 x 50mm	ST6.3 x 38mm
ST2.9 x 25mm	ST3.5 x 25mm	ST3.9 x 19mm	ST4.2 x 16mm			ST5.5 x 16mm		ST6.3 x 45mm
		ST3.9 x 22mm	ST4.2 x 19mm			ST5.5 x 19mm		ST6.3 x 50mm

SCREWS

CROSS RECESSED PAN HEAD TAPPING SCREW Steel Zinc Plated, Black Passivated



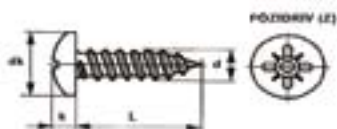
ISO	:	7049 CH
DIN	:	7981 CH
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5
P	1.1	1.3	1.3	1.4	1.6	1.8
dk	5.6	6.9	7.5	8.2	9.5	10.8
k	2.2	2.6	2.8	3.05	3.55	3.95
Nr. Phillips (H) recess	1	2	2	2	2	3
Nr. Acc. to ISO	4	6	7	8	10	12

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 6.5mm	ST3.5 x 19mm	ST3.9 x 9.5mm	ST4.2 x 9.5mm	ST4.2 x 32mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 25mm
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 25mm	ST3.9 x 13mm	ST4.2 x 13mm	ST4.2 x 38mm	ST4.8 x 19mm		ST5.5 x 32mm
ST2.9 x 13mm	ST3.5 x 13mm	ST3.5 x 32mm	ST3.9 x 16mm	ST4.2 x 16mm	ST4.2 x 50mm	ST4.8 x 25mm	ST5.5 x 13mm	ST5.5 x 38mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.5 x 38mm	ST3.9 x 19mm	ST4.2 x 19mm		ST4.8 x 32mm	ST5.5 x 16mm	ST5.5 x 45mm
ST2.9 x 19mm			ST3.9 x 25mm	ST4.2 x 25mm	ST4.8 x 13mm	ST4.8 x 38mm	ST5.5 x 19mm	ST5.5 x 50mm
ST2.9 x 25mm								

CROSS RECESSED PAN HEAD TAPPING SCREW Steel Zinc Plated



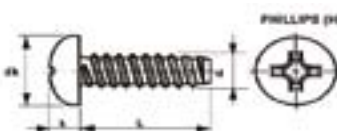
ISO	:	7049 CZ
DIN	:	7981 CZ
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	E25-658 C



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.9	7.5	8.2	9.5	10.8	12.5
k	2.2	2.6	2.8	3.05	3.55	3.95	4.55
Nr. Pozidriv (Z) recess	1	2	2	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 6.5mm	ST3.5 x 32mm	ST3.9 x 19mm	ST4.2 x 19mm	ST4.8 x 16mm	ST5.5 x 13mm	ST5.5 x 45mm	ST6.3 x 25mm
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 25mm	ST4.2 x 25mm	ST4.8 x 19mm	ST5.5 x 16mm	ST5.5 x 50mm	ST6.3 x 32mm
ST2.9 x 13mm	ST3.5 x 13mm			ST4.2 x 32mm	ST4.8 x 25mm	ST5.5 x 19mm		ST6.3 x 38mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 9.5mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 32mm	ST5.5 x 25mm	ST6.3 x 13mm	ST6.3 x 45mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 13mm		ST4.8 x 38mm	ST5.5 x 32mm	ST6.3 x 16mm	ST6.3 x 50mm
ST2.9 x 25mm	ST3.5 x 25mm	ST3.9 x 16mm	ST4.2 x 16mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 38mm	ST6.3 x 19mm	
					ST4.8 x 50mm			

CROSS RECESSED PAN HEAD TAPPING SCREW Steel Nickel Plated



ISO	:	7049 FH
DIN	:	7981 FH
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

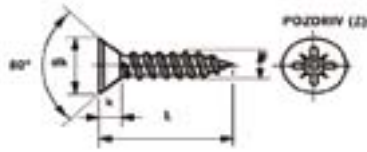


d	ST2.2	ST2.9	ST3.5	ST4.2	ST4.8
P	0.8	1.1	1.3	1.4	1.6
dk	4.2	5.6	6.9	8.2	9.5
k	1.8	2.2	2.6	3.05	3.55
Nr. Phillips (H) recess	1	1	2	2	2
Nr. Acc. to ISO	2	4	6	8	10

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.2 x 4.5mm	ST2.9 x 4.5mm	ST2.9 x 9.5mm	ST2.9 x 19mm	ST3.5 x 8mm	ST3.5 x 16mm	ST4.2 x 9.5mm	ST4.2 x 19mm	ST4.8 x 13mm
ST2.2 x 6.5mm	ST2.9 x 6.5mm	ST2.9 x 13mm		ST3.5 x 9.5mm	ST3.5 x 19mm	ST4.2 x 13mm	ST4.2 x 32mm	ST4.8 x 19mm
	ST2.9 x 8mm	ST2.9 x 16mm	ST3.5 x 6.5mm	ST3.5 x 13mm		ST4.2 x 16mm		

SCREWS

CROSS RECESSED COUNTERSUNK HEAD TAPPING SCREW Steel Zinc Plated



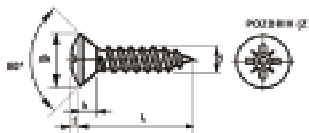
ISO : 7050 CZ
DIN : 7982 CZ
NEN : -
ANSI : -
BS : -
NF : E25-656 C



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.5	6.8	7.5	8.100	9.5	10.800	12.400
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
Nr. Pozidriv (Z) recess	1	2	2	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 32mm	ST3.9 x 19mm	ST4.2 x 16mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 32mm	ST6.3 x 19mm
ST2.9 x 13mm	ST3.5 x 13mm	ST3.5 x 38mm	ST3.9 x 25mm	ST4.2 x 19mm	ST4.8 x 19mm		ST5.5 x 38mm	ST6.3 x 25mm
ST2.9 x 16mm	ST3.5 x 16mm		ST3.9 x 32mm	ST4.2 x 25mm	ST4.8 x 25mm	ST5.5 x 13mm	ST5.5 x 45mm	ST6.3 x 32mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 9.5mm		ST4.2 x 32mm	ST4.8 x 32mm	ST5.5 x 16mm	ST5.5 x 50mm	ST6.3 x 38mm
ST2.9 x 25mm	ST3.5 x 25mm	ST3.9 x 13mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 38mm	ST5.5 x 19mm		ST6.3 x 45mm
		ST3.9 x 16mm	ST4.2 x 13mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 25mm	ST6.3 x 16mm	ST6.3 x 50mm

CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW Steel Zinc Plated



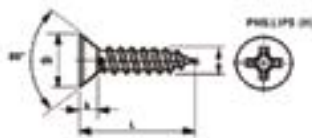
ISO : 7051 CZ
DIN : 7983 CZ
NEN : -
ANSI : -
BS : -
NF : E25-657 C



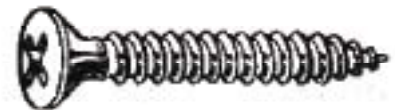
d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.5	6.8	7.5	8.100	9.5	10.800	12.400
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
f =	0.9	1.2	1.3	1.4	1.5	1.7	2
Nr. Pozidriv (Z) recess	1	2	1.3	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 38mm	ST3.9 x 25mm	ST4.2 x 32mm	ST4.8 x 25mm	ST5.5 x 13mm	ST5.5 x 45mm	ST6.3 x 25mm
ST2.9 x 13mm	ST3.5 x 13mm			ST4.2 x 38mm	ST4.8 x 32mm	ST5.5 x 16mm		
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 9.5mm	ST4.2 x 13mm		ST4.8 x 38mm	ST5.5 x 19mm	ST5.5 x 50mm	ST6.3 x 32mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 16mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 25mm		ST6.3 x 38mm
ST2.9 x 25mm	ST3.5 x 25mm	ST3.9 x 16mm	ST4.2 x 19mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 32mm	ST6.3 x 16mm	ST6.3 x 45mm
	ST3.5 x 32mm	ST3.9 x 19mm	ST4.2 x 25mm	ST4.8 x 19mm		ST5.5 x 38mm	ST6.3 x 19mm	ST6.3 x 50mm

CROSS RECESSED COUNTERSUNK HEAD TAPPING SCREW Steel Zinc Plated and Steel Nickel Plated



ISO : 7050 CH
DIN : 7982 CH
NEN : -
ANSI : -
BS : -
NF : -

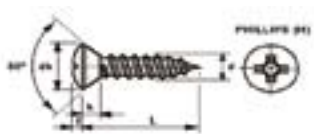


d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.8	7.5	8.100	9.5	10.800	12.400
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
Nr. Phillips (H) recess	1	2	2	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.9 x 9.5mm	ST3.9 x 25mm	ST4.2 x 22mm	ST4.8 x 19mm	ST5.5 x 13mm	ST5.5 x 45mm	ST6.3 x 32mm
ST2.9 x 13mm	ST3.5 x 13mm	ST3.9 x 13mm	ST3.9 x 32mm	ST4.2 x 25mm	ST4.8 x 22mm	ST5.5 x 16mm	ST5.5 x 50mm	ST6.3 x 38mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 16mm		ST4.2 x 32mm	ST4.8 x 25mm	ST5.5 x 19mm		ST6.3 x 45mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 19mm	ST4.2 x 9.5mm	ST4.2 x 38mm	ST4.8 x 32mm	ST5.5 x 22mm	ST6.3 x 16mm	ST6.3 x 50mm
ST2.9 x 22mm	ST3.5 x 25mm	ST3.9 x 22mm	ST4.2 x 13mm		ST4.8 x 38mm	ST5.5 x 25mm	ST6.3 x 19mm	ST6.3 x 55mm
ST2.9 x 25mm	ST3.5 x 32mm		ST4.2 x 16mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 32mm	ST6.3 x 22mm	ST6.3 x 60mm
	ST3.5 x 38mm		ST4.2 x 19mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 38mm	ST6.3 x 25mm	

SCREWS

CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW Steel Zinc Plated, BLACK Passivated



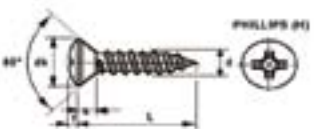
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DIN	:	7983 CH
NEN	:	-
ANSI	:	-
BS	:	-



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5
P	1.1	1.3	1.3	1.4	1.6	1.8
dk	5.6	6.8	7.5	8.1	9.5	10.8
k =	1.7	2.1	2.3	2.5	3	3.4
f =	0.9	1.2	1.3	1.4	1.5	1.7
Nr. Phillips (H) recess	1	2	2	2	2	3
Nr. Acc. to ISO	4	6	7	8	10	12

SIZE AVAILABLE					
d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.9 x 9.5mm	ST4.2 x 16mm	ST4.8 x 16mm	ST5.5 x 16mm
ST2.9 x 13mm	ST3.5 x 13mm	ST3.9 x 9.5mm	ST4.2 x 19mm	ST4.8 x 19mm	ST5.5 x 19mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 16mm	ST4.2 x 25mm	ST4.8 x 25mm	ST5.5 x 25mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 19mm	ST4.2 x 32mm	ST4.8 x 32mm	ST5.5 x 32mm
ST2.9 x 22mm	ST3.5 x 25mm	ST3.9 x 25mm	ST4.2 x 38mm	ST4.8 x 38mm	ST5.5 x 38mm
ST2.9 x 25mm	ST3.5 x 32mm			ST4.8 x 45mm	ST5.5 x 50mm
	ST3.5 x 38mm	ST4.2 x 13mm	ST4.8 x 13mm	ST4.8 x 50mm	

CROSS RECESSED RAISED COUNTERSUNK HEAD TAPPING SCREW Steel Zinc Plated and Steel Nickel Plated



ISO	:	7051 CH
DIN	:	7983 CH
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

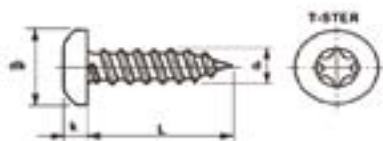


d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.8	7.5	8.1	9.5	10.8	12.4
k =	1.7	2.1	2.3	2.5	3	3.4	3.8
f =	0.9	1.2	1.3	1.4	1.5	1.7	2
Nr. Phillips (H) recess	1	2	2	2	2	3	3
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE							
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.9 x 9.5mm	ST3.9 x 25mm	ST4.2 x 32mm	ST4.8 x 22mm	ST5.5 x 13mm	ST5.5 x 38mm
ST2.9 x 13mm	ST3.5 x 13mm	ST3.9 x 13mm		ST4.2 x 38mm	ST4.8 x 25mm	ST5.5 x 16mm	ST5.5 x 45mm
ST2.9 x 16mm	ST3.5 x 16mm	ST3.9 x 16mm	ST4.2 x 13mm	ST4.2 x 45mm	ST4.8 x 32mm	ST5.5 x 19mm	ST5.5 x 50mm
ST2.9 x 19mm	ST3.5 x 19mm	ST3.9 x 19mm	ST4.2 x 16mm		ST4.8 x 38mm	ST5.5 x 22mm	
ST2.9 x 22mm	ST3.5 x 25mm	ST3.9 x 22mm	ST4.2 x 19mm	ST4.8 x 13mm	ST4.8 x 45mm	ST5.5 x 25mm	ST6.3 x 16mm
ST2.9 x 25mm	ST3.5 x 32mm		ST4.2 x 22mm	ST4.8 x 16mm	ST4.8 x 50mm	ST5.5 x 32mm	ST6.3 x 19mm
	ST3.5 x 38mm		ST4.2 x 25mm	ST4.8 x 19mm			ST6.3 x 22mm

SCREWS

HEXALOBULAR PAN HEAD TAPPING SCREWS Steel Zinc Plated



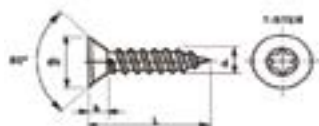
ISO	:	7049 C
DIN	:	7981 C
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	E25-654 C



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.9	7.5	8.200	9.5	10.800	12.5
k	2.2	2.6	2.8	3.05	3.55	3.95	4.55
Nr. Torx bit	TX8	TX10	TX15	TX20	TX25	TX25	TX30

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm		ST3.5 x 13mm	ST3.5 x 19mm	ST3.9 x 13mm	ST4.2 x 19mm	ST4.8 x 13mm	ST5.5 x 19mm	ST6.3 x 19mm
ST2.9 x 13mm	ST3.5 x 9.5mm	ST3.5 x 16mm		ST4.2 x 13mm		ST4.8 x 16mm	ST5.5 x 25mm	ST6.3 x 25mm
			ST3.9 x 9.5mm	ST4.2 x 16mm	ST4.2 x 25mm	ST4.8 x 19mm	ST5.5 x 32mm	ST6.3 x 32mm

HEXALOBULAR COUNTERSUNK HEAD TAPPING SCREWS Steel Zinc Plated



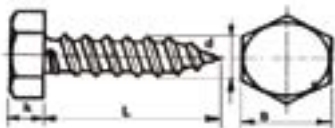
ISO	:	7050 C
DIN	:	7982 CZ
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	E25-652 C



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.1	1.3	1.3	1.4	1.6	1.8	1.8
dk	5.6	6.9	7.5	8.200	9.5	10.800	12.5
k	2.2	2.6	2.8	3.05	3.55	3.95	4.55
Nr. Torx bit	TX8	TX10	TX15	TX20	TX25	TX25	TX30

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 16mm	ST3.5 x 32mm	ST3.9 x 9.5mm	ST4.2 x 19mm	ST4.2 x 38mm	ST4.8 x 13mm	ST5.5 x 45mm	ST6.3 x 45mm
ST2.9 x 13mm	ST3.5 x 19mm		ST3.9 x 13mm	ST4.2 x 32mm		ST4.8 x 19mm		ST6.3 x 50mm

HEXAGON HEAD TAPPING SCREWS with CONE END Steel Zinc Plated



ISO	:	1479 C
DIN	:	7976 C
NEN	:	-
ANSI	:	B18.6.5M
BS	:	4174
NF	:	E25-662 C

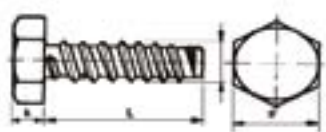


d	ST6.3
P	1.8
k	4.8
s	10
Nr. Acc. to ISO	14

SIZE AVAILABLE			
d x L	d x L	d x L	d x L
ST6.3 x 13mm	ST6.3 x 16mm	ST6.3 x 19mm	ST6.3 x 25mm

SCREWS

HEXAGON HEAD TAPPING SCREWS with FLAT END Steel Zinc Plated



ISO	:	1479 F
DIN	:	7976 F
NEN	:	-
ANSI	:	B18.6.5M
BS	:	4174
NF	:	E25-662 F



d	ST4.8	ST6.3	ST8.0
P	1.6	1.8	2.1
k	3	4.8	5.8
s	8	10	13
Nr. Acc. to ISO	10	14	16

SIZE AVAILABLE						
d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST4.8 x 9.5mm	ST4.8 x 16mm	ST4.8 x 25mm	ST6.3 x 13mm	ST6.3 x 19mm	ST8(7.9) x 16mm	ST8(7.9) x 25mm
ST4.8 x 13mm	ST4.8 x 19mm		ST6.3 x 16mm	ST6.3 x 25mm	ST8(7.9) x 19mm	

SLOTTED HEXAGON WASHER HEAD TAPPING SCREWS Steel Zinc Plated



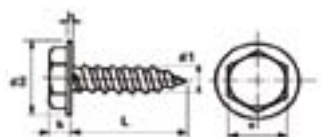
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DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	ST2.8	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.3	1.3	1.3	1.4	1.6	1.6	1.6
d2 (max)	6.5	7.21	9.18	9.5	10.61	11.08	13.2
k (max)	1.97	2.67	2.67	3.17	3.42	4.1	4.8
h (max)	0.5	0.54	0.8	0.79	0.78	0.99	1.2
s	5	5.5	7	7	8	8	10
Nr. Acc. to ISO	4	6	7	8	10	12	14

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 6.5mm	ST3.5 x 9.5mm	ST3.5 x 19mm	ST3.9 x 9.5mm	ST4.2 x 9.5mm	ST4.2 x 16mm	ST4.2 x 25mm	ST4.8 x 19mm	ST6.3 x 19mm
ST2.9 x 9.5mm	ST3.5 x 13mm	ST3.5 x 25mm	ST3.9 x 16mm	ST4.2 x 13mm	ST4.2 x 19mm			
ST2.9 x 13mm	ST3.5 x 16mm					ST4.8 x 19mm	ST5.5 x 19mm	

SEMA - HEXAGON WASHER HEAD TAPPING SCREWS Steel Zinc Plated



ISO	:	1479 C
DIN	:	7976 C
NEN	:	-
ANSI	:	B 18.6.5M
BS	:	4174
NF	:	E25-662 C

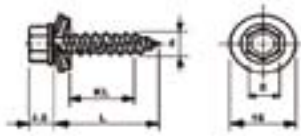


d1	ST3.5	ST4.2	ST4.8
P	1.3	1.4	1.6
d2	7.2	9	10
k	2.5	2.8	3.1
h	0.5	0.6	0.7
s	5.5	7	8
Nr. Acc. to ISO	6	8	10

SIZE AVAILABLE					
d1 x L	ZINC PL.	d1 x L	ZINC PL.	d x L	ZINC PL.
ST3.5 x 9.5mm	ST3.5 x 16mm	ST4.2 x 9.5mm	ST4.2 x 16mm	ST4.8 x 13mm	ST4.8 x 19mm
ST3.5 x 13mm	ST3.5 x 19mm	ST4.2 x 13mm	ST4.2 x 19mm	ST4.8 x 16mm	ST4.8 x 25mm
			ST4.2 x 24mm		ST4.8 x 32mm

SCREWS

ROOF and FRONT BOLTS with ELASTOMER SEALING RING Type A - Stainless Steel A2



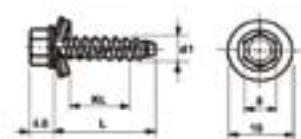
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DIN : -
NEN : -
ANSI : -
BS : -
NF : -



SIZE AVAILABLE			
d x L	d x L	d x L	d x L
6.5 x 19mm	6.5 x 25mm	6.5 x 32mm	6.5 x 38mm

ASSEMBLY DATA									
Material thickness in mm		0.63-1.1	1.25-1.5	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-10.0	>10.0
Recommended roof-front bolt		Type A			Type B				
MATERIAL		HOLE SIZES IN MM							
Roof-front bolt	Construction								
Stainless-st	Steel & Al	4	4.5	5	5.05	5.35	5.65	5.8	5.85
Aluminium	Aluminium	4.0 - 4.5			-				
Aluminium	Wood	4.0			-				
Grip length in steel and Al		L-12			L-10				
Bolt length L in Wood		min. 3mm			-				

ROOF and FRONT BOLTS with ELASTOMER SEALING RING Type B - Stainless Steel A2

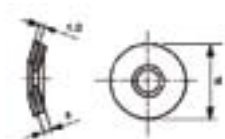


ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



SIZE AVAILABLE		
d x L	d x L	d x L
6.3 x 19mm	6.3 x 25mm	6.5 x 38mm

SEALING RINGS - Stainless Steel A2 / ELASTOMER



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



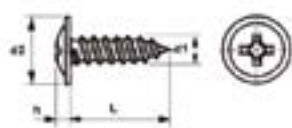
d1	16	19	22
d2	6.7	6.7	6.7
s	2	3	3

d	d	d
16mm	19mm	22mm

ASSEMBLY DATA									
Material thickness in mm		0.63-1.1	1.25-1.5	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-10.0	>10.0
Recommended roof-front bolt			Type A				Type B		
MATERIAL		HOLE SIZES IN MM							
Roof-front bolt	Construction								
Stainless-st	Steel & Al	4	4.5	5	5.05	5.35	5.65	5.8	5.85
Aluminium	Aluminium	4.0 - 4.5			-				
Aluminium	Wood	4.0			-				
Grip length in steel and Al		L-12			L-10				
Bolt length L in Wood		min. 3mm			-				

SCREWS

CROSS RECESSED MUSHROOM HEAD SCREWS with FLANGE Steel Zinc Plated, Black Passivated



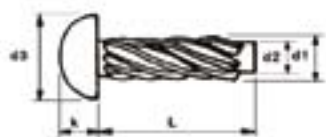
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DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	ST3.5	ST3.9	ST4.2	ST4.8
P	1.3	1.3	1.4	1.6
dc (max)	9	10	10	11.5
k	2.3	2.5	2.6	2.7
Nr. Phillips (H) recess	2	2	2	2

SIZE AVAILABLE					
d x L	d1 x L	d1 x L	d1 x L	d x L	d x L
ST3.5 x 16mm	ST3.9 x 19mm	ST4.2 x 16mm	ST4.2 x 22mm	ST4.8 x 16mm	ST4.8 x 25mm
		ST4.2 x 19mm		ST4.8 x 19mm	

DRIVE SCREWS - Steel Nickel Plated



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	1.5	1.9	2.5	2.9	3.5
d2	1.35	1.7	2.15	2.65	3.1
d3	2.5	3.2	4.1	5.3	6.6
k	0.8	1.2	1.7	2.1	2.6
Drill Ø	1.4	1.7	2.2	2.6	3.1

SIZE AVAILABLE								
d1 x L	d1 x L	d1 x L	d1 x L	d1 x L	d1 x L	d1 x L	d1 x L	d1 x L
1.5 x 3.2mm	1.9 x 3.2mm	1.5 x 6.5mm	1.9 x 6.5mm	2.5 x 4.7mm	2.9 x 4.7mm	2.9 x 6.5mm	3.5 x 6.5mm	3.5 x 9.5mm
1.5 x 4.7mm	1.9 x 4.7mm			2.5 x 6.5mm		2.9 x 8mm	3.5 x 8mm	
			2.5 x 3.2mm					

SCREWS

SELF-DRILLING SCREWS

General:	with Self-drilling screw fastening system of Direct Assembly the correct corehole is drilled; the thread is tapped, and the construction parts are connected reliably in one single operation. Thus no drilling of the hole and no thread tapping.
Material:	the Self Drilling Screws are made of hardened steel (min. 560 HV 0.3), with the core remain tough (270-425 HV 0.3) Fabory Spedec self-drilling screws meet the size, requirements and test acc. to DIN 7504.
System:	every Self-drilling screw drills the hole with its own integrated self-drilling point. thus quicker and lighter assembly and no time consuming alignment and positioning of construction parts.
Recess:	Self Drilling Screws are provided with a PHILLIPS recess, TORX recess or SR recess, thus equipped for mechanized mass assembly with electrical setting tools.
Standards:	Self Drilling Screw head forms and dimensions are according to DIN standards of normal screws.
Threads:	Self Drilling Screws with self tapping threads (designation ST) according to DIN 7970. Full thread to achieve good clamping in the joint.
Application:	Stainless steel A2 self drilling screw are only to be used in aluminium alloys with a Brinel hardness up to 75 HB , aluminium self drilling screws are only to be used in plastic and aluminium alloys.

Guide values for Steel Self- Drilling Screws Type SIN

d		ST2.9	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
Breaking torque min. in NM		1.8	2.9	3.8	4.6	7.1	11	18
Tensile force min. in N		3400	4950	6100	7050	9400	12600	17250
Shear load min. in N		2000	2900	3600	4200	5400	7100	9200
Drill capacity in steel cross members	(min.)	0.8	0.8	0.8	2.5	2.8	2.8	2.8
(SR 37/52) incl. intervening space	(max.)	2	2.3	2.4	3.5	4.5	5.5	6.5
Drilling machine (unloaded)	r.p.m	3500	3500	3500	3500	3500	2900	2900
	output Watt	340-400	340-400	340-400	340-400	340-400	400-700	400-700
Av. Drilling time in	approx. sec	1.5	2	3	3	3.5	4.5	5.5

SR - RECESS

Type recess:	screws have various type of recess, i.e. slotted recess, Phillips-cross, Pozidriv-cross recess , hexabular recess, TORX-recess and SR - recess. The first five type have general dis-advantage, dimensional deviation of the recess and tool result in excessive clearance between recess and tool, resulting in instability when starting the screw, (vibrating and trembling). This excessive clearance can also be a problem when dis-assembling screw in a difficult location.
SR - recess:	the SR recess has been developed to eliminate the problem of excessive clearance. The SR-recess is in principle a combination of a square-recess and cross-recess. Advantages of the SR-recess: the specially developed square-recess enables the SR-screw to be attached directly to the SR-tool. This eliminates any tolerance deviation and fatigue. The screw, despite its own mass, remains firmly attached to the tool. The life expectancy of a SR-tool (bit) is double the life of a conventional tool.

SCREWS

SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Aluminium



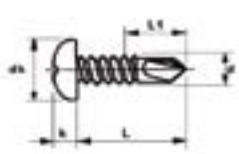
ISO : -
DIN : 7504 M
NEN : -
ANSI : -
BS : -
NF : -



d	ST4.2	ST4.8
P	1.4	1.6
dk	8.2	9.5
k	3.05	3.55
L1 ^①	7	8
Nr. Phillips (H) recess	2	2

SIZE AVAILABLE		
d x L	d x L	d x L
ST4.2 x 13mm	ST4.8 x 13mm	

SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS With SR-RECESS - Steel Zinc Plated



ISO : -
DIN : 7504 M
NEN : -
ANSI : -
BS : -
NF : -



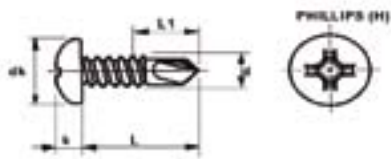
d	ST3.5	ST3.9	ST4.2	ST4.8
P	1.3	1.3	1.4	1.6
dk	6.9	7.5	8.2	9.5
k	2.6	2.8	3.05	3.55
L1 ^①	5	6	7	8
Nr. Phillips (H) recess	2	2	2	2

SIZE AVAILABLE								
d x L	Stnl. St. A2		d x L	Stnl. St. A2		d x L	Stnl. St. A2	
ST3.5 x 9.5mm	ST3.5 x 19mm	ST3.9 x 13mm	ST3.9 x 19mm	ST4.2 x 13mm	ST4.2 x 25mm	ST4.8 x 13mm	ST4.8 x 19mm	ST4.8 x 32mm
ST3.5 x 13mm	ST3.5 x 25mm	ST3.9 x 16mm	ST3.9 x 25mm	ST4.2 x 16mm	ST4.2 x 32mm	ST4.8 x 16mm	ST4.8 x 25mm	ST4.8 x 38mm
ST3.5 x 16mm				ST4.2 x 19mm				

- ① Max. grip length $KL = L - L1$.
Assembly with the universal electric setting tool CF 21,
- ② SR-recess is a cross recess / square recess combination
Max. grip length $KL = L - L1$

SCREWS

SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Steel Zinc Plated



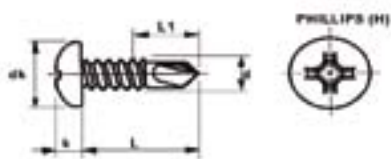
ISO : -
DIN : 7504 M
NEN : -
ANSI : -
BS : -
NF : -



d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8
P	1.1	1.3	1.3	1.4	1.6
dk	5.6	6.9	7.5	8.2	9.5
k	2.2	2.6	2.8	3.05	3.55
L1 = ①	4.5	5	6	7	8
Nr. Phillips (H) recess	1	2	2	2	2

SIZE AVAILABLE						
d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 16mm	ST3.9 x 16mm	ST4.2 x 13mm	ST4.2 x 25mm	ST4.8 x 16mm	ST4.8 x 32mm
	ST3.5 x 19mm	ST3.9 x 19mm	ST4.2 x 16mm	ST4.2 x 32mm	ST4.8 x 19mm	ST4.8 x 38mm
ST3.5 x 9.5mm	ST3.5 x 25mm	ST3.9 x 25mm	ST4.2 x 19mm		ST4.8 x 22mm	ST4.8 x 50mm
ST3.5 x 13mm	ST3.9 x 13mm	ST3.9 x 32mm	ST4.2 x 22mm	ST4.8 x 13mm	ST4.8 x 25mm	

SELF-DRILLING CROSS RECESSED PAN HEAD SCREWS - SN Stainless Steel A2



ISO : -
DIN : 7504 M
NEN : -
ANSI : -
BS : -
NF : -



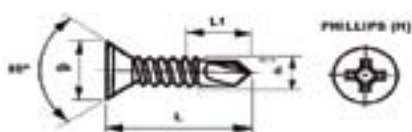
d	ST2.9	ST3.5	ST3.9	ST4.2	ST4.8
P	1.1	1.3	1.3	1.4	1.6
dk	5.6	6.9	7.5	8.2	9.5
k	2.2	2.6	2.8	3.05	3.55
L1 = ①	4.5	5	6	7	8
Nr. Phillips (H) recess	1	2	2	2	2

SIZE AVAILABLE						
d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST2.9 x 9.5mm	ST3.5 x 9.5mm	ST3.5 x 19mm	ST3.9 x 25mm	ST4.2 x 16mm	ST4.2 x 22mm	ST4.8 x 16mm
	ST3.5 x 13mm	ST3.9 x 16mm		ST4.2 x 19mm	ST4.2 x 25mm	ST4.8 x 22mm
			ST4.2 x 13mm			

- ① Max. grip length $KL = L - L1$.
Assembly with the universal electric setting tool CF 21,

SCREWS

SELF-DRILLING CROSS RECESSED COUNTERSUNK HEAD SCREWS Steel Zinc Plated



ISO : -
DIN : 7504 O
NEN : -
ANSI : -
BS : -
NF : -



d	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.3	1.3	1.4	1.6	1.8	1.8
dk	6.8	7.5	8.1	9.5	10.8	12.4
L1 = $\odot$	5	6	7	8	10	11
Nr. Phillips (H) recess	2	2	2	2	3	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST3.5 x 13mm	ST3.9 x 13mm	ST3.9 x 22mm	ST4.8 x 25mm	ST4.2 x 16mm	ST4.2 x 25mm	ST4.8 x 38mm	ST5.5 x 32mm	ST6.3 x 45mm
ST3.5 x 16mm	ST3.9 x 16mm	ST3.9 x 25mm	ST4.8 x 32mm	ST4.2 x 19mm	ST4.2 x 32mm	ST4.8 x 45mm	ST5.5 x 38mm	ST6.3 x 50mm
ST3.5 x 19mm	ST3.9 x 19mm	ST3.9 x 32mm		ST4.2 x 22mm		ST4.8 x 50mm		ST6.3 x 55mm
ST3.5 x 25mm								

STAINLESS STEEL A2

d	ST3.5	ST3.9	ST4.2	ST4.8
P	1.3	1.3	1.4	1.6
dk	6.8	7.5	8.1	9.5
L1 = $\odot$	5	6	7	8
Nr. Phillips (H) recess	2	2	2	2

SIZE AVAILABLE			
d x L	d x L	d x L	d x L
ST3.5 x 16mm	ST3.9 x 19mm	ST4.2 x 25mm	ST4.8 x 25mm

SELF-DRILLING COUNTERSUNK SCREWS with SR-RECESS Steel Zinc Plated



ISO : -
DIN : 7504 O
NEN : -
ANSI : -
BS : -
NF : -

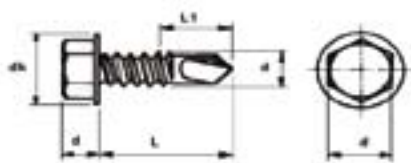


d	ST3.5	ST3.9	ST4.2	ST4.8	ST5.5	ST6.3
P	1.3	1.3	1.4	1.6	1.8	1.8
dk	6.8	7.5	8.1	9.5	10.8	12.4
L1 = $\odot$	5	6	7	8	10	11
Nr. Phillips (H) recess	2	2	2	2	3	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST3.5 x 13mm	ST3.5 x 25mm	ST3.9 x 16mm	ST3.9 x 25mm	ST4.2 x 16mm	ST4.2 x 32mm	ST4.8 x 38mm	ST5.5 x 32mm	ST6.3 x 45mm
ST3.5 x 16mm		ST3.9 x 19mm	ST3.9 x 32mm	ST4.2 x 19mm		ST4.8 x 45mm	ST5.5 x 38mm	ST6.3 x 50mm
ST3.5 x 19mm	ST3.9 x 13mm	ST3.9 x 22mm		ST4.2 x 22mm	ST4.8 x 25mm	ST4.8 x 50mm		ST6.3 x 55mm
				ST4.2 x 25mm	ST4.8 x 32mm			

SCREWS

SELF-DRILLING HEXAGON HEAD SCREWS with COLLAR Steel Zinc Plated



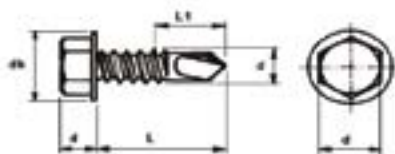
ISO : -
DIN : 7504 K
NEN : -
ANSI : -
BS : -
NF : -



d	ST4.2	ST4.8	ST5.5	ST6.3
P	1.4	1.6	1.8	1.8
dc	8.8	10.5	11	13.2
k (max)	4.25	4.45	5.45	6.45
s	7	8	8	10
L1 = ☉	7	8	10	11

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
ST4.2 x 13mm	ST4.2 x 32mm	ST4.8 x 19mm	ST4.8 x 32mm	ST4.8 x 50mm	ST5.5 x 22mm	ST5.5 x 32mm	ST6.3 x 22mm	ST6.3 x 38mm
ST4.2 x 16mm		ST4.8 x 22mm	ST4.8 x 38mm		ST5.5 x 25mm		ST6.3 x 25mm	ST6.3 x 45mm
ST4.2 x 19mm	ST4.8 x 13mm	ST4.8 x 25mm	ST4.8 x 45mm	ST5.5 x 19mm	ST5.5 x 38mm	ST6.3 x 19mm	ST6.3 x 32mm	ST6.3 x 50mm
ST4.2 x 25mm	ST4.8 x 16mm							

SELF-DRILLING HEXAGON HEAD SCREWS with COLLAR STAINLESS STEEL - A2



ISO : -
DIN : 7504 K
NEN : -
ANSI : -
BS : -
NF : -



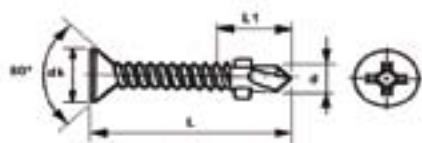
d	ST4.2	ST4.8	ST5.5	ST6.3
P	1.4	1.6	1.8	1.8
dc	8.8	10.5	11	13.2
k (max)	4.25	4.45	5.45	6.45
s	7	8	8	10
L1 = ☉	7	8	10	11

SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
ST4.2 x 25mm	ST4.8 x 19mm	ST4.8 x 32mm	ST5.5 x 22mm	ST6.3 x 22mm

- ① Assembly with the universal electric setting tool CF 21,
- ② Max. grip length KL = L - L1

SCREWS

SELF-DRILLING CROSS RECESSED SCREWS with WINGS Steel Zinc Plated



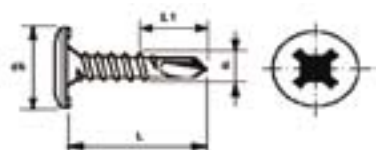
ISO : -
DIN : 7504 O
NEN : -
ANSI : -
BS : -
NF : -



d	ST4.2	ST4.8	ST5.5
P	1.4	1.6	1.8
dk	8.1	9.5	10.8
L1 = 2	11	14	15
Nr. Phillips (H) recess	2	2	3
Tensile Force in N	7000	9300	12500
Drill capacity in steel cross members (St 37) 3 (max.)	0.7	1.5	2.0
	2.0	3.0	4.5

SIZE AVAILABLE		
d x L	d x L	d x L
ST4.2 x 25mm	ST4.8 x 32mm	ST4.8 x 45mm
ST4.2 x 32mm	ST4.8 x 38mm	
ST4.2 x 38mm		ST5.5 x 38mm

SELF-DRILLING MUSHROOM HEAD SCREWS with SR RECESS Steel Zinc Plated



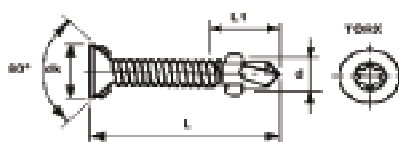
ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



d		ST4.8	ST4.8	ST4.8	ST4.8
P		1.6	1.6	1.6	1.6
L		1.6	19	25	32
dk		13	15	15	15
L1 = 2		7-8	8-9	8-9	8-9
Nr. SR bit 3		2	2	2	2
Drill capacity in steel cross members 4	(min.)	1	1	1	1
	(max.)	3	3	3	3
Drill capacity in Aluminium	(min.)	1.5	1.5	1.5	1.5
	(max.)	4	4	4	4

SIZE AVAILABLE		
d x L	d x L	d x L
ST4.8 x 16mm	ST4.8 x 25mm	ST4.8 x 32mm
ST4.8 x 19mm		

SELF-DRILLING TORX COUNTERSUNK HEAD SCREWS with WINGS Steel Zinc Plated



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



d		U6.3 (1/4)	U6.3 (1/4)
Threads per inch		20	20
dk		12	15
L1 = 2		16	16
Nr. Torx bit		TX30	TX30
Drill capacity in steel cross members 4	(min.)	2.5	2.5
	(max.)	6	6

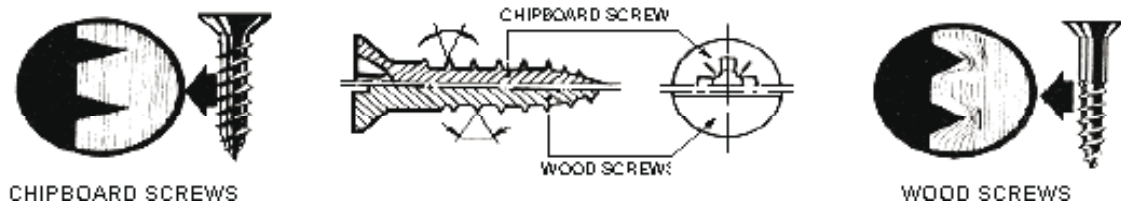
ITEMS CODE NUMBER		
d x L	d x L	d x L
U6.3 x 55mm	U6.3 x 70mm	

SCREWS

CLIPBOARD SCREWS

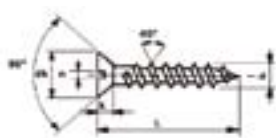
General:	chipboard screws, also called speedscrews, are developed to prevent the problems arising with the application of the conventional wood screws in chipboard and different type of wood.
Properties:	the benefits are achieved by the following properties. adapted geometry of the thread, the thread angle of the wood thread has been diminished from 60° to 40°.
Advantages:	with the same major diameter the minor diameter is smaller and of equal thickness over the full screwlength (except the point). The normal length chipboard screws have thread, till just under the head. A sharp self centering point, through which easier start of drilling and less risk of wobbling. Expensive and time consuming pre-drilling is often unnecessary. The sharper and deeper profile of the thread does not push aside the material, but cuts into it. Less risk of crumbling and splitting of small crosscut sides e.g. with the installation of door and window furniture. Besides this is a better grip (up to 35% higher pull-out values) and up to 40% lower installation torque.
Material:	chipboard screws are made of case hardened steel and surface hardened. They are stronger and more wear resistant than wood-screws, increasing the cutting performance and preventing damage during installation. A toughened core avoids breaking of screw head at bending.
Assembly:	chipboard screw are provided with a special corrosion resistant lubricant causing a decrease of the installation torque.
Recess:	although chipboard screws are available from stock in the slotted condition, for the industrial use screws with Pozidriv (Z) cross recess are preferred, which can be efficiently tightened with automatic setting tools.
Types:	besides the normal chipboard screws, f.i. the slotted version, cross recessed and hexalobular recessed are also available.

TECHNICAL DATA



SCREWS

SLOTTED COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated



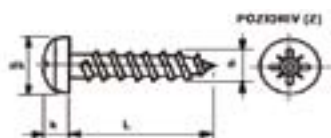
ISO	:	-
DIN	:	7500 N (966)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	4
dk	8
k	2.6
n	1

SIZE AVAILABLE	
d x L	d x L
4 x 30mm	4 x 40mm

CROSS RECESSED RAISED CHEESE HEAD SCREWS for CHIPBOARD Steel Zinc Plated



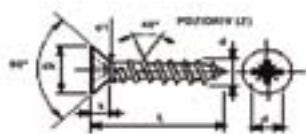
ISO	:	-
DIN	:	7500 D (933)
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	2.4	3	3.5	4	4.5	5	5
dk	4.8	6	7	8	9	10	10
k	1.7	2.2	2.6	2.8	3.0	3.5	3.5
Nr. Pozidriv (Z) recess	1	1	2	2	2	2	2

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
2.4 x 13mm	3 x 15mm	3.5 x 13mm	3.5 x 35mm	4 x 20mm	4 x 50mm	4.5 x 30mm	5 x 17mm	5 x 45mm
2.4 x 15mm	3 x 17mm	3.5 x 15mm	3.5 x 40mm	4 x 25mm		4.5 x 35mm	5 x 20mm	5 x 50mm
2.4 x 17mm	3 x 20mm	3.5 x 17mm		4 x 30mm	4.5 x 15mm	4.5 x 40mm	5 x 25mm	5 x 60mm
	3 x 25mm	3.5 x 20mm	4 x 13mm	4 x 35mm	4.5 x 17mm	4.5 x 45mm	5 x 30mm	5 x 70mm
3 x 13mm	3 x 30mm	3.5 x 25mm	4 x 15mm	4 x 40mm	4.5 x 20mm	4.5 x 50mm	5 x 35mm	5 x 80mm
		3.5 x 30mm	4 x 17mm	4 x 45mm	4.5 x 25mm		5 x 40mm	

CROSS RECESSED COUNTERSUNK SCREWS with HOLE for CHIPBOARD Steel Zinc Plated



ISO	:	-
DIN	:	7500
NEN -	:	
ANSI	:	-
BS	:	-
NF	:	-

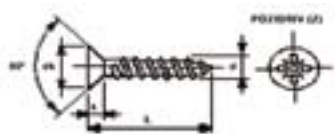


d	4.5	5	6
dk	9	10	12
d1	2.5	2.5	2.5
k	2.9	3.2	3.9
Nr. Pozidriv (Z) recess	2	2	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
4.5 x 20mm	4.5 x 35mm	4.5 x 50mm	5 x 40mm	5 x 70mm	5 x 100mm	6 x 60mm	6 x 90mm	6 x 120mm
4.5 x 25mm	4.5 x 40mm	4.5 x 60mm	5 x 50mm	5 x 80mm		6 x 70mm	6 x 100mm	6 x 130mm
4.5 x 30mm	4.5 x 45mm	4.5 x 70mm	5 x 60mm	5 x 90mm	6 x 50mm	6 x 80mm	6 x 110mm	

SCREWS

CROSS RECESS COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated and Zinc Plated, Yellow Passivated



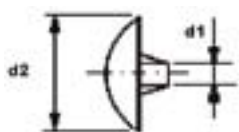
ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	2.4	3	3.5	4	4.5	5	6
dk	4.8	6	7	8	9	10	12
k	1.7	1.9	2.3	2.6	2.9	3.2	3.9
Nr. Pozidriv (Z) recess	1	1	2	2	2	2	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
2.4 x 10mm	3 x 20mm	3.5 x 25mm	4 x 20mm	4.5 x 15mm	4.5 x 60mm	5 x 30mm	5 x 100mm	6 x 80mm
2.4 x 13mm	3 x 25mm	3.5 x 30mm	4 x 25mm	4.5 x 17mm	4.5 x 70mm	5 x 35mm		6 x 90mm
2.4 x 15mm	3 x 30mm	3.5 x 35mm	4 x 30mm	4.5 x 20mm	4.5 x 80mm	5 x 40mm	6 x 30mm	6 x 100mm
2.4 x 17mm	3 x 35mm	3.5 x 40mm	4 x 35mm	4.5 x 25mm		5 x 45mm	6 x 35mm	6 x 110mm
			4 x 40mm	4.5 x 30mm	5 x 17mm	5 x 50mm	6 x 40mm	6 x 120mm
3 x 10mm	3.5 x 13mm	4 x 13mm	4 x 45mm	4.5 x 35mm	5 x 20mm	5 x 60mm	6 x 45mm	6 x 130mm
3 x 13mm	3.5 x 15mm	4 x 15mm	4 x 50mm	4.5 x 40mm	5 x 25mm	5 x 70mm	6 x 50mm	6 x 140mm
3 x 15mm	3.5 x 17mm	4 x 17mm	4 x 60mm	4.5 x 45mm		5 x 80mm	6 x 60mm	6 x 150mm
3 x 17mm	3.5 x 20mm		4 x 70mm	4.5 x 50mm		5 x 90mm	6 x 70mm	

COVERS for CROSS RECESS COUNTERSUNK SCREWS with HOLE For CHIPBOARD - Plastic



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



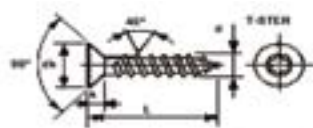
d1	2	3
d2	12	14.5
For use with Pozidriv (Z) recess	2	3

RAL Color						
COLOR	Beige	Fir	Medium-Brown	Dark-Brown	Black	White
RAL	1011	1014	8007	8011	9005	9010

d1-RAL		d1-RAL		d1-RAL	
2 - 1011		2 - 9005		3 - 8011	
2 - 1014		2 - 9010		3 - 9005	
2 - 8007				3 - 9010	
2 - 8011		3 - 1014			

SCREWS

HEXABULAR COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	3	3.5	4	4.5	5
dk	6	7	8	9	10
k	1.9	2.3	2.6	2.9	3.2
Nr. Torx bit	TX10	TX15	TX20	TX20	TX25

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
3 x 20mm	3 x 20mm	3 x 30mm	4 x 17mm	4 x 25mm	4 x 40mm	4.5 x 30mm	4.5 x 50mm	5 x 50mm
3 x 25mm	3 x 25mm	3 x 40mm	4 x 20mm	4 x 30mm	4 x 45mm	4.5 x 40mm		5 x 60mm
				4 x 35mm	4 x 50mm		5 x 40mm	

VBA/PLUS - CROSS RECESS RAISED CHEESE SCREWS for CHIPBOARD Steel Zinc Plated



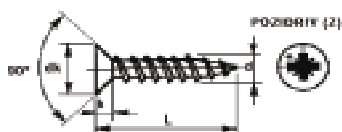
ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	3	3.5	4	4.5	5
dk (max)	6.35	7.45	8.45	9.45	10.45
k (max)	2.3	2.6	3	3.35	5.75
Nr. Pozidriv (Z) recess	1	2	2	2	2

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
3 x 13mm	3 x 20mm	3.5 x 15mm	3.5 x 25mm	4 x 15mm	4 x 25mm	4.5 x 20mm	5 x 20mm	5 x 40mm
3 x 15mm		3.5 x 17mm	3.5 x 30mm	4 x 17mm	4 x 30mm	4.5 x 30mm	5 x 25mm	5 x 50mm
3 x 17mm	3.5 x 13mm	3.5 x 20mm		4 x 20mm	4 x 40mm	4.5 x 40mm	5 x 30mm	

VBA/PLUS - CROSS RECESS COUNTERSUNK SCREWS for CHIPBOARD Steel Zinc Plated



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d	3	3.5	4	4.5	5	6
dk (max)	5.9	6.9	7.9	8.9	9.9	11.9
k (max)	1.8	2.1	2.4	2.7	3	3.5
Nr. Pozidriv (Z) recess	1	2	2	2	2	3

SIZE AVAILABLE								
d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L	d x L
3 x 13mm	3.5 x 20mm	4 x 17mm	4 x 45mm	4.5 x 35mm	5 x 30mm	5 x 100mm	6 x 60mm	6 x 120mm
3 x 15mm	3.5 x 25mm	4 x 20mm	4 x 50mm	4.5 x 40mm	5 x 35mm	5 x 120mm	6 x 70mm	6 x 130mm
3 x 20mm	3.5 x 30mm	4 x 25mm	4 x 60mm	4.5 x 45mm	5 x 40mm		6 x 80mm	6 x 140mm
3 x 25mm	3.5 x 40mm	4 x 30mm	4.5 x 20mm	4.5 x 50mm	5 x 50mm	6 x 35mm	6 x 90mm	6 x 150mm
3 x 30mm		4 x 35mm	4.5 x 25mm		5 x 80mm	6 x 40mm	6 x 100mm	
3.5 x 15mm	4 x 15mm	4 x 40mm	4.5 x 30mm	5 x 25mm	5 x 90mm	6 x 50mm	6 x 110mm	



NUTS

154 HEXAGON NUTS
A 194 GRADE 2H - Steel



155 HEXAGON NUTS - METRIC FINE PITCH THREAD
Steel and Zinc Plated Yellow Passivated



155 HEXAGON THIN NUTS - METRIC FINE PITCH THREAD
Steel and Steel Zinc Plated



156 HEXAGON NUTS
Steel and Steel Zinc Plated



156 HEXAGON NUTS - Steel Zinc Plated
Yellow Passivated and Black Passivated



157 HEX COUPLING NUTS (LONG NUTS)
Steel Zinc Plated



157 ROUND CONNECTION NUTS
Steel and Steel Zinc Plated



157 SQUARE NUTS
Steel and Steel Zinc Plated



157 SQUARE THIN NUTS
Steel and Steel Zinc Plated



158 HEXAGON NUTS - Left Hand Thread
Steel and Steel Zinc Plated



158 HEXAGON NUTS - Metric Fine Pitch Thread
Left Hand Thread STEEL



159 HEXAGON NUTS - Metric Fine Pitch Thread Steel and
Zinc Plated Yellow Passivated



159 HEXAGON THIN NUTS - METRIC FINE PITCH THREAD
Steel and Steel Zinc Plated



160 PREVAILING TORQUE TYPE HEX NUT with PLASTIC INSERT
Steel Zinc Plated and Yellow Passivated



160 PREVAILING TORQUE TYPE HEX NUT with PLASTIC INSERT
METRIC FINE PITCH THREAD
Steel Zinc Plated and Yellow Passivated



161 HEXAGON LOCKNUTS with NYLON INSERT
Steel Zinc and Yellow Passivated



161 PREVAILING TORQUE TYPE HEX NUT with PLASTIC INSERT
HIGH TYPE - Steel Zinc and Yellow Passivated



162 TENSILOCK - SELF LOCKING HEXAGON NUTS - STEEL



162 HEXAGON FLANGE NUTS with TEETH
Steel Zinc Plated



163 RIPP - SELF LOCKING HEXAGON FLANGE NUTS - STEEL



163 HEXAGON FLANGE NUTS with SERRATION
Steel Zinc and Yellow Passivated



164 HEXAGON SLOTTED and CASTLE NUTS
METRIC FINE PITCH THREAD - Steel



CONTENTS

164 HEXAGON THIN, SLOTTED and CASTLE NUTS - STEEL



164 HEXAGON THIN, SLOTTED and CASTLE NUTS
METRIC FINE PITCH THREAD - STEEL



165 WING BUTTERFLY NUTS LIGHT TYPE -Steel Zinc Plated



165 WING BUTTERFLY NUTS - Cast Iron Zinc Plated



165 DRIVE-IN NUTS for WOOD
Steel and Steel Zinc Plated



166 HEXAGON DOMED CAP NUTS - Steel and Steel Zinc Plated



166 HEXAGON DOMED CAP NUTS with WELDED CAP
Steel Chrome Plated



167 HEXAGON WELD NUTS - Steel



167 SQUARE WELD NUTS - Steel



167 SQUARE WELD NUTS - Steel



168 BLIND RIVET NUTS with CYLINDRICAL HEAD and KNURLE
Steel and Steel Zinc Plated & YELLOW Passivated



168 BLIND RIVET NUTS with CYLINDRICAL HEAD and HEX SHAFT
Steel Zinc Plated, Yellow Passivated



169 BLIND RIVET NUTS with CYLINDRICAL HEAD
Steel Zinc Plated, Yellow Passivated



169 BLIND RIVET NUTS with COUNTERSUNK HEAD
Steel Zinc Plated, Yellow Passivated



170 BLIND RIVET NUTS with COUNTERSUNK HEAD - ALUMINUM



171 BLIND RIVET NUTS with CYLINDRICAL HEAD - ALUMINUM



171 BLIND RIVET NUTS with COUNTERSUNK HEAD - STAINLESS STEEL



172 Duct fixing products
Wedge NUT - electro Galvanized or Yellow Zinc Plated



172 PLAIN CHANNEL STRUT NUTS - zinc Plated



172 CHANNEL STRUT NUTS with SHORT SPRING - zinc Plated



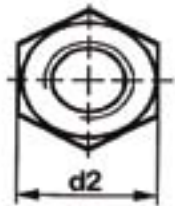
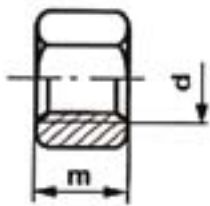
172 CHANNEL STRUT NUTS with LONG SPRING - zinc Plated



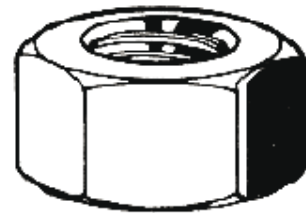
NUTS

HEXAGON NUTS

A 194 GRADE 2H - Steel



ISO : -
DIN : -
ANSI : -
BSI : -
NF : -



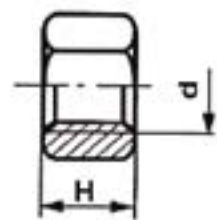
d	M10	M12	M14	M16	M20	M22	M24	M27
P	1.5	1.75	2	6	2.5	2.5	3	3
m = d	10	12	14	16	20	22	24	27
d2	17	19	22	24	30	32	36	41

d	M30	M33	M36	M39	M42	M45	M48	M52
P	3.5	3.5	4	4	4.5	4.5	5	5
m = d	30	33	36	39	42	45	48	52
d2	46	50	55	60	65	70	75	80

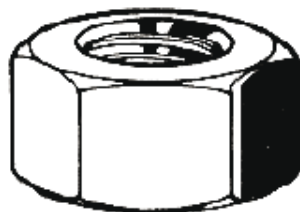
SIZE AVAILABLE		
d	d	d
M10	M24	M39
M12	M27	M42
M14	M30	M45
M16	M33	M48
M20	M36	M52
M22		

HEXAGON NUTS

A 194 GRADE 2H - Steel



ISO : -
DIN : -
ANSI : B18.22
BSI : -
NF : -



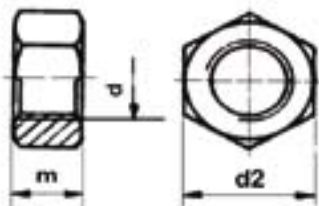
d	Inch	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
	mm	12.7	15.9	19.05	22.2	25.4	28.6	31.75
Thread per inch		13	11	10	9	8	8	8
H		12.3	15.5	18.65	21.85	25	28.2	31.75
F	inch	7/8	11/16	11/4	1 7/16	1 5/8	1 13/16	2
	mm	22.2	27	31.75	36.5	41.3	46.05	50.8

d	Inch	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	
	mm	34.9	38.1	41.3	44.45	47.65	50.8	
Thread per inch		8	8	8	8	8	8	
H		34.15	37.3	40.5	43.65	46.85	50	
F	inch	2 3/16	2 3/8	2 9/16	2 3/4	2 15/16	3 1/8	
	mm	55.55	60.3	65.1	69.85	74.6	79.4	

SIZE AVAILABLE		
d	d	d
1/2	1 1/8	1 3/4
5/8	1 1/4	1 7/8
3/4	1 3/8	2 "
7/8	1 1/2	
1 "	1 5/8	

NUTS

HEXAGON NUTS - Metric Fine Pitch Thread Steel and Zinc Plated Yellow Passivated



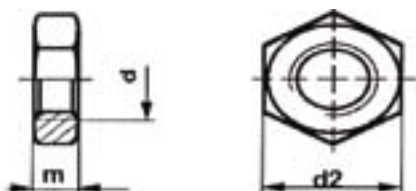
ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401



d x P	M4x0.75	M5x0.90	M6x0.75	M8x1	M10x1	M10x1.25	M12x1	M12x1.25	M12x1.5	M14x1.5	M16x1
m	3.2	4	5	6.5	8	8	10	10	10	11	13
d2	7	8	10	13	17	17	19	19	19	22	24
d x P	M16x1.5	M18x1	M18x1.5	M18x2	M20x1.5	M20x2	M22x1	M22x1.5	M22x2	M24x1.5	M24x2
m	13	15	15	15	16	16	16	18	18	19	19
d2	24	27	27	27	30	30	32	32	32	36	36
d x P	M26x1.5	M27x1.5	M27x2	M28x2	M30x1	M30x1.5	M30x2	M32x2	M33x1.5	M33x2	M36x1.5
m	22	22	22	22	24	24	24	26	26	26	29
d2	41	41	41	41	46	46	46	50	50	50	55
d x P	M36x2	M36x3	M38x1.5	M39x1.5	M39x3	M40x1.5	M40x2	M42x1.5	M42x3	M45x1.5	M45x3
m	29	29	31	31	31	31	31	34	34	36	36
d2	55	55	60	60	60	60	60	65	65	70	70
d x P	M48x1.5	M48x2	M48x3	M52x1.5	M52x3	M56x2	M56x4	M60x2	M60x4	M64x4	M68x4
m	38	38	38	42	42	45	45	48	48		54
d2	75	75	75	80	80	85	85	90	90	95	100

SIZE AVAILABLE											
d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P
M4 x 0.75	M10 x 1.00	M16 x 1.00	M20 x 1.50	M24 x 1.50	M28 x 2.00	M33 x 1.50	M38 x 1.50	M42 x 1.50	M48 x 2.00	M56 x 2.00	M64 x 4.00
		M16 x 1.50	M20 x 2.00	M24 x 2.00		M33 x 2.00		M42 x 3.00	M48 x 3.00	M56 x 4.00	
M5 x 0.90	M12 x 1.00				M30 x 1.00		M39 x 1.50				M68 x 4.00
	M12 x 1.25	M18 x 1.00	M22 x 1.00	M26 x 1.50	M30 x 1.50	M36 x 1.50	M39 x 3.00	M45 x 1.50	M52 x 1.50	M60 x 2.00	
M6 x 0.75	M12 x 1.50	M18 x 1.00	M22 x 1.50		M30 x 2.00	M36 x 2.00		M45 x 3.00	M52 x 1.50	M60 x 2.00	
		M18 x 1.00	M22 x 2.00	M27 x 1.50		M36 x 3.00	M40 x 1.50				
M8 x 1.00	M14 x 1.50			M27 x 2.00	M32 x 2.00		M40 x 2.00	M48 x 1.50			

HEXAGON THIN NUTS - METRIC FINE PITCH THREAD Steel and Steel Zinc Plated



ISO : 8675
DIN : 439 B
NEN : 2334 B
ANSI : B18.2.4.5M
BS : -
NF : E25-453



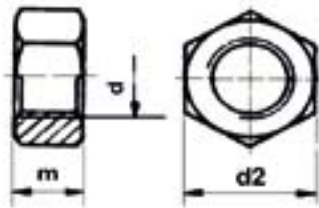
d x P	M10x1	M10x1.25	M12x0.75	M12x1	M12x1.25	M12x1.5	M14x1	M14x1.25	M14x1.5	M16x1
m	5	5	6	6	6	6	7	7	7	8
d2	17	17	19	19	19	19	22	22	22	24
d x P	M16x1.5	M18x1	M18x1.5	M18x2	M20x1	M20x1.5	M22x1	M22x2	M24x1.5	M24x2
m	8	9	9	9	10	10	11	11	12	12
d2	24	27	27	27	30	30	32	32	36	36
d x P	M27x1.5	M30x1.5	M30x2	M32x2	M33x1.5	M33x2	M35x1.5	M36x1.5	M36x3	
m	13.5	15	15	16	16.5	16.5	17.5	18	18	
d2	41	46	46	50	50	50	55	55	55	
d x P	M38x1.5	M39x1.5	M39x2	M39x3	M40x1.5	M40x2	M42x1.5	M42x1.5	M45x2	
m	19	19.5	19.5	19.5	20	20	21	22.5	22.5	
d2	60	60	60	60	60	60	65	70	70	
d x P	M45x3	M48x1.5	M48x2	M48x3	M52x1.5	M52x2	M52x3	M56x2	M56x4	
m	22.5	24	24	24	26	26	26	28	28	
d2	70	75	75	75	80	80	80	85	85	

SIZE AVAILABLE										
d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P
M10 x 1.00	M12 x 1.25		M18 x 2.00	M22 x 2.00		M32 x 2.00		M40 x 1.50	M45 x 2.00	M52 x 1.50
M10 x 1.25	M12 x 1.50	M16 x 1.00			M30 x 1.50		M38 x 1.50	M40 x 2.00	M45 x 3.00	M52 x 2.00
		M16 x 1.50	M20 x 1.00	M24 x 1.50	M30 x 2.00	M35 x 1.50				M52 x 13.00
			M20 x 1.50	M24 x 2.00			M39 x 1.50	M42 x 1.50	M48 x 1.50	
M12 x 0.75	M14 x 1.00									
M12 x 1.00	M14 x 1.25	M18 x 1.00			M33 x 1.50	M36 x 1.50	M39 x 2.00		M48 x 2.00	M56 x 2.00
	M14 x 1.50	M18 x 1.50	M22 x 1.00	M27 x 1.50	M33 x 2.00	M36 x 3.00	M39 x 3.00	M45 x 1.50	M48 x 3.00	M56 x 4.00

NUTS

HEXAGON NUTS

Steel and Steel Zinc Plated



ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : 4168-5
NF : E25-401



d	M3	M4	M5	M6	M7	M8	M10	M12	M14	M16	M18
P	0.5	0.7	0.8	1	1	1.25	1.5	1.75	2	2	2.5
m	2.4	3.2	4	5	5.5	6.5	8	10	11	13	15
d2	5.5	7	8	10	11	13	17	19	22	24	27

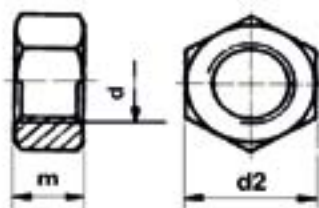
d	M20	M22	M24	M7	M30	M33	M36	M39	M42	M45	M48
P	2.5	2.5	3	3	3.5	3.5	4	4	4.5	4.5	5
m	16	18	19	22	24	26	29	31	34	36	38
d2	30	32	36	41	46	50	55	60	65	70	75

d	M52	M56	M60	M64	M68	M72 X6	M72 X6	M80x6	M90x6	M100x6	M110x6
P	5	5.5	5.5	6	6	6	6	6	6	6	6
m	42	45	48	51	54	58	61	64	72	80	88
d2	80	85	90	95	100	105	110	115	130	145	155

SIZE AVAILABLE											
d	d	d	d	d	d	d	d	d	d	d	d
M3	M6	M10	M16	M22	M30	M39	M48	M60	M72 x 6	M90 x 6	
M4	M7	M12	M18	M24	M33	M42	M52	M64	M72 x 6	M100 x 6	
M5	M8	M14	M20	M27	M36	M45	M56	M68	M72 x 6	M110 x 6	

HEXAGON NUTS - Steel Zinc Plated

Yellow Passivated and Black Passivated



ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401



d	M3	M4	M5	M6	M7	M8	M10	M12	M14	M16	M18
P	0.5	0.7	0.8	1	1	1.25	1.5	1.75	2	2	2.5
m	2.4	3.2	4	5	5.5	6.5	8	10	11	13	16
d2	5.5	7	8	10	11	13	17	19	22	24	27

d	M20	M22	M24	M27	M30
P	2.5	2.5	3	3	3.5
m	16	18	19	22	24
d2	30	32	36	41	46

SIZE AVAILABLE								
d	d	d	d	d	d	d	d	d
M3	M5	M7	M10	M14	M18	M22	M27	M30
M4	M6	M8	M12	M16	M20	M24		

NUTS

HEX COUPLING NUTS (LONG NUTS)

Steel Zinc Plated



ISO : -
DIN : 557
NEN : -
ANSI : -
BS : -
NF : E25-404



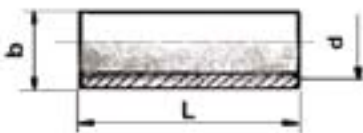
d	M5	M6	M8	M10	M12	M14	M16	M18
P	0.8	1	1.25	1.5	1.75	2	2	2.5
m	15	18	24	30	36	42	48	54
d2	8	10	13	17	19	22	24	27

d	M20	M22	M24	M30	M36	M42	M48
P	2.5	2.5	3	2.5	2.5	2.5	3
m	60	66	72	90	108	126	144
d2	30	32	36	46	55	65	75

SIZE AVAILABLE						
d	d	d	d	d	d	d
M5	M8	M12	M16	M22	M30	M42
M6	M10	M14	M20	M24	M36	M48

ROUND CONNECTION NUTS

Steel and Steel Zinc Plated



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -

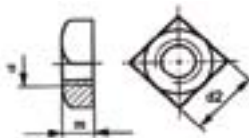


d	M6	M8	M10	M12
P	0.5	0.7	0.8	1
b	1.8	2.2	2.7	3.2

SIZE AVAILABLE			
d x L	ZINC PL.	d x L	d x L
M6 x 30	M8 x 30	M10 x 40	M12 x 40

SQUARE NUTS

Steel and Steel Zinc Plated



ISO : -
DIN : 557
NEN : -
ANSI : -
BS : -
NF : E25-404



d	M4	M5	M6	M8	M10	M12
P	0.7	0.8	1	1.25	1.5	1.75
m (h15)	0.7	4	5	6.5	8	10
d2	3.2	8	10	13	16(17) ²	18(19) ²

SIZE AVAILABLE		
d	d	d
M4	M6	M10
M5	M8	M12

SQUARE THIN NUTS

Steel and Steel Zinc Plated



ISO : -
DIN : 562
NEN : -
ANSI : -
BS : -
NF : -

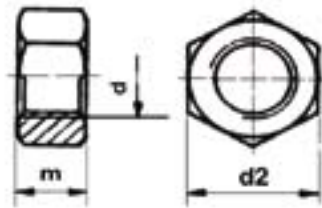


d	M3	M4	M5	M6	M8	M10
P	0.5	0.7	0.8	1	1.25	1.5
m	1.8	2.2	2.7	3.2	4	5
d2	5.5	7	8	10	13	17

SIZE AVAILABLE					
d	d	d	d	d	d
M3	M4	M6	M8	M10	M12

NUTS

HEXAGON NUTS - Left Hand Thread Steel and Steel Zinc Plated



ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401

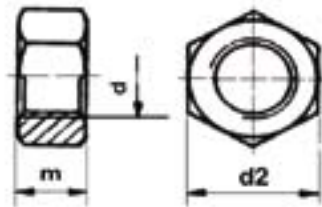


d	M3	M4	M5	M6	M8	M10	M10	M12	M14	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.5	1.75	2	2
m	2.4	3.2	4	5	6.5	8	8	10	11	13
d2	5.5	7	8	10	13	17	15	19	22	24

d	M18	M20	M22	M24	M27	M30	M33	M36	M42	M48
P	2.5	2.5	2.5	3	3	3.5	3.5	4	4.5	5
m	15	16	18	19	22	24	26	29	34	38
d2	27	30	32	36	41	46	50	55	65	75

SIZE AVAILABLE								
d	d	d	d	d	d	d	d	d
M3	M6	M10	M12	M18	M22	M27	M33	M42
M4	M8	M10/d2=15	M14		M24	M30	M36	M48
M5			M16	M20				

HEXAGON NUTS - Metric Fine Pitch Thread - Left Hand Thread STEEL



ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401



d x P	M12x1.25	M12x1.5	M14x1.5	M16x1.5	M18x1.5	M20x2	M22x2
m	10	10	11	13	15	16	18
d2	19	19	22	24	27	30	32

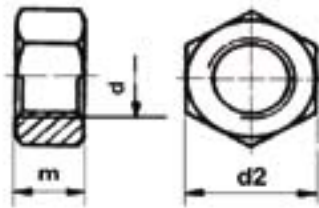
d x P	M24x1.5	M24x2	M27x1.5	M27 x 2	M30x1.5	M30x2	M33x2
m	19	19	22	22	24	24	26
d2	36	36	41	41	46	46	50

d x P	M36x1.5	M36x2	M42x1.5	M45x3	M48x1.5	M48x3	
m	29	29	34	36	31	31	
d2	55	55	65	70	60	60	

SIZE AVAILABLE					
d x P	d x P	d x P	d x P	d x P	d x P
M12 x 1.25	M16 x 1.50	M22 x 2.00	M27 x 1.50	M33 x 2.00	M45 x 3.00
M12 x 1.50			M27 x 2.00		
	M18 x 1.50	M24 x 1.50		M36 x 1.50	M48 x 1.50
M14 x 1.50		M24 x 2.00	M30 x 1.50	M36 x 2.00	M48 x 3.00
	M20 x 2.00		M30 x 2.00		
				M42 x 1.50	

NUTS

HEXAGON NUTS - Metric Fine Pitch Thread Steel and Zinc Plated Yellow Passivated



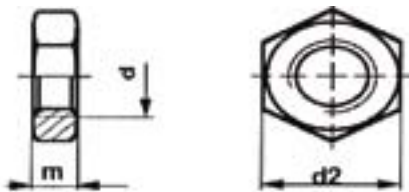
ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401



d x P	M4x0.75	M5x0.90	M6x0.75	M8x1	M10x1	M10x1.25	M12x1	M12x1.25	M12x1.5	M14x1.5	M16x1
m	3.2	4	5	6.5	8	8	10	10	10	11	13
d2	7	8	10	13	17	17	19	19	19	22	24
d x P	M16x1.5	M18x1	M18x1.5	M18x2	M20x1.5	M20x2	M22x1	M22x1.5	M22x2	M24x1.5	M24x2
m	13	15	15	15	16	16	16	18	18	19	19
d2	24	27	27	27	30	30	32	32	32	36	36
d x P	M26x1.5	M27x1.5	M27x2	M28x2	M30x1	M30x1.5	M30x2	M32x2	M33x1.5	M33x2	M36x1.5
m	22	22	22	22	24	24	24	26	26	26	29
d2	41	41	41	41	46	46	46	50	50	50	55
d x P	M36x2	M36x3	M38x1.5	M39x1.5	M39x3	M40x1.5	M40x2	M42x1.5	M42x3	M45x1.5	M45x3
m	29	29	31	31	31	31	31	34	34	36	36
d2	55	55	60	60	60	60	60	65	65	70	70
d x P	M48x1.5	M48x2	M48x3	M52x1.5	M52x3	M56x2	M56x4	M60x2	M60x4	M64x4	M68x4
m	38	38	38	42	42	45	45	48	48		54
d2	75	75	75	80	80	85	85	90	90	95	100

SIZE AVAILABLE											
d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P
M4 x 0.75	M10 x 1.00	M16 x 1.00	M20 x 1.50	M24 x 1.50	M28 x 2.00	M33 x 1.50	M38 x 1.50	M42 x 1.50	M48 x 2.00	M56 x 2.00	M64 x 4.00
		M16 x 1.50	M20 x 2.00	M24 x 2.00		M33 x 2.00		M42 x 3.00	M48 x 3.00	M56 x 4.00	
M5 x 0.90	M12 x 1.00				M30 x 1.00		M39 x 1.50				M68 x 4.00
	M12 x 1.25	M18x 1.00	M22 x 1.00	M26 x 1.50	M30 x 1.50	M36 x 1.50	M39 x 3.00	M45 x 1.50	M52 x 1.50	M60 x 2.00	
M6 x 0.75	M12 x 1.50	M18x 1.00	M22 x 1.50		M30 x 2.00	M36 x 2.00		M45 x 3.00	M52 x 1.50	M60 x 2.00	
		M18x 1.00	M22 x 2.00	M27 x 1.50		M36 x 3.00	M40 x 1.50				
M8 x 1.00	M14 x 1.50			M27 x 2.00	M32 x 2.00		M40 x 2.00	M48 x 1.50			

HEXAGON THIN NUTS - METRIC FINE PITCH THREAD Steel and Steel Zinc Plated



ISO : 8675
DIN : 439 B
NEN : 2334 B
ANSI : B18.2.4.5M
BS : -
NF : E25-453

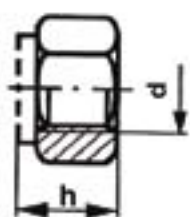


d x P	M10x1	M10x1.25	M12x0.75	M12x1	M12x1.25	M12x1.5	M14x1	M14x1.25	M14x1.5	M16x1
m	5	5	6	6	6	6	7	7	7	8
d2	17	17	19	19	19	19	22	22	22	24
d x P	M16x1.5	M18x1	M18x1.5	M18x2	M20x1	M20x1.5	M22x1	M22x2	M24x1.5	M24x2
m	8	9	9	9	10	10	11	11	12	12
d2	24	27	27	27	30	30	32	32	36	36
d x P	M27x1.5	M30x1.5	M30x2	M32x2	M33x1.5	M33x2	M35x1.5	M36x1.5	M36x3	
m	13.5	15	15	16	16.5	16.5	17.5	18	18	
d2	41	46	46	50	50	50	55	55	55	
d x P	M38x1.5	M39x1.5	M39x2	M39x3	M40x1.5	M40x2	M42x1.5	M42x1.5	M45x2	
m	19	19.5	19.5	19.5	20	20	21	22.5	22.5	
d2	60	60	60	60	60	60	65	70	70	
d x P	M45x3	M48x1.5	M48x2	M48x3	M52x1.5	M52x2	M52x3	M56x2	M56x4	
m	22.5	24	24	24	26	26	26	28	28	
d2	70	75	75	75	80	80	80	85	85	

SIZE AVAILABLE											
d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P	d x P
M10 x 1.00	M12 x 1.25	M16 x 1.00	M20 x 2.00	M22 x 2.00	M30 x 1.50	M32 x 2.00	M38 x 1.50	M40 x 1.50	M45 x 2.00	M52 x 1.50	M52 x 13.00
M10 x 1.25	M12 x 1.50	M16 x 1.50	M20 x 1.00	M24 x 1.50	M30 x 2.00	M35 x 1.50	M39 x 1.50	M42 x 1.50	M48 x 1.50	M56 x 2.00	
M12 x 0.75	M14 x 1.00	M18 x 1.00	M22 x 1.00	M27 x 1.50	M33 x 1.50	M36 x 1.50	M39 x 2.00	M45 x 1.50	M48 x 3.00	M56 x 4.00	
M12 x 1.00	M14 x 1.25	M18 x 1.50	M22 x 1.50	M27 x 2.00	M33 x 2.00	M36 x 3.00	M39 x 3.00	M45 x 1.50	M48 x 3.00	M56 x 4.00	

NUTS

PREVAILING TORQUE TYPE HEX NUT with PLASTIC INSERT Steel Zinc Plated and Yellow Passivated



ISO : -
DIN : 934
NEN : 1560
ANSI : -
BS : -
NF : E25-401



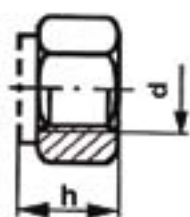
d	M3	M4	M5	M6	M7	M8	M10	M12	M14
P	0.5	0.7	0.8	1	1	1.25	1.5	1.75	2
d2	5.5	7	8	10	11	13	17	19	22
h	4	5	5	6	7.5	8	10	12	14

d	M16	M18	M20	M22	M24	M27	M30	M33	M36
P	2	2.5	2.5	2.5	3	3	3.5	3.5	4
d2	24	27	30	32	36	41	46	60	55
h	16	18.5	20	22	24	27	30	33	36

d	M39	M42	M45	M48	M52	M56	M60	M64
P	4	4.5	4.5	5	5	5.5	5.5	6
d2	60	65	70	75	80	85	90	95
h	39	42	45	48	52	56	60	64

SIZE AVAILABLE								
d	d	d	d	d	d	d	d	d
M3	M6	M10	M16	M22	M30	M39	M48	M60
M4	M7	M12	M18	M24	M33	M42	M52	M64
M5	M8	M14	M20	M27	M36	M45	M56	

PREVAILING TORQUE TYPE HEX NUT with PLASTIC INSERT METRIC FINE PITCH THREAD Steel Zinc Plated and Yellow Passivated



ISO : -
DIN : 985
NEN : -
ANSI : -
BS : -
NF : E25-412



d x P	M8x1	M10x1	M10x1.25	M12x1	M12x1.25	M12x1.5	M14x1.5	M18x1.5	M20x1.5	M20x2
d2	13	17	17	19	19	19	22	27	30	30
h	8	10	10	12	12	12	14	18.5	20	20

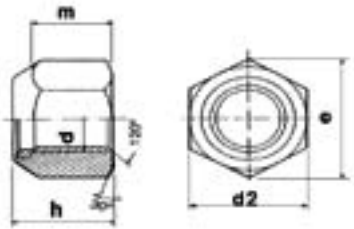
d	M22x1.5	M24x1.5	M24x2	M27x1.5	M27x2	M30x1.5	M30x2	M33x1.5	M33x2	M36x1.5
d2	32	36	36	41	41	46	46	50	50	55
h	22	24	24	27	27	30	30	33	33	36

d	M36x3	M39x3	M42x1.5	M42x3	M45x1.5	M45x3	M46x1.5	M48x3
d2	55	60	65	65	70	70	75	75
h	36	39	42	42	45	45	48	48

SIZE AVAILABLE										
d	d	d	d	d	d	d	d	d	d	d
M8 x 1.00	M12 x 1.00	M16 x 1.50	M20 x 1.50	M24 x 1.50	M27 x 2.00	M33 x 1.50	M36 x 1.50	M42 x 1.50	M45 x 1.50	M48 x 1.50
	M12 x 1.00		M20 x 2.00	M24 x 2.00		M33 x 2.00	M36 x 3.00	M42 x 3.00	M45 x 3.00	M48 x 3.00
M10 x 1.00		M18 x 1.50			M30 x 1.50		M39 x 3.00			
M10 x 1.25	M14 x 1.50		M22 x 1.50	M27 x 1.50	M30 x 2.00					

NUTS

HEXAGON LOCKNUTS WITH NYLON INSERT STEEL ZINC AND YELLOW PASSIVATED



ISO : -
DIN : 985
NEN : -
ANSI : -
BS : -
NF : -

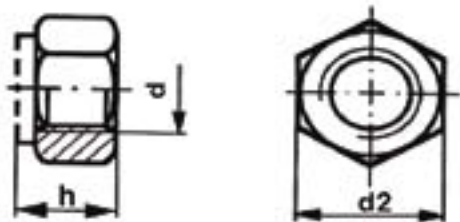


d	M2.5	M3	M4	M5	M6	M8	M10	M12	M14
m	2.3	2.4	2.9	3.2	4	5.5	6.50	8.00	9.5
h	3.5	4	5	5	6	8	10	12	14
d2	5	5.5	7	8	10	13	17	19	22
e	5.5	6.01	7.66	8.79	11.5	14.38	18.90	21.10	24.49

d	M16	M18	M20	M22	M24	M27	M30	M33
m	10.5	13	14	15	15	17	19.00	22
h	16	18.5	20	22	24	27	30	33
d2	24	27	30	32	36	41	46	50
e	26.75	29.56	32.95	35.03	39.55	45.2	50.85	55.37

SIZE AVAILABLE								
d	d	d	d	d	d	d	d	d
M2.5	M4	M6	M10	M14	M18	M22	M27	M33
M3	M5	M8	M12	M16	M20	M24	M30	

PREVAILING TORQUE TYPE HEX NUT WITH PLASTIC INSERT HIGH TYPE - STEEL ZINC AND YELLOW PASSIVATED



ISO : -
DIN : 982
NEN : -
ANSI : -
BS : -
NF : -



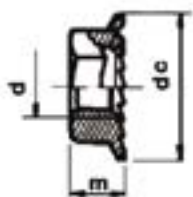
d x P	M5	M6	M8	M10	M12	M14	M16
P	0.8	1	1.25	1.5	1.75	2	2
d2	8	10	13	17	19	22	24
h	6.3	8	9.5	11.5	14	16	18

d	M18	M20	M24
P	2.5	2.5	3
d2	27	30	36
h	20	22	28

SIZE AVAILABLE	
d	d
M5	M16
M6	M18
M8	
M10	M20
	M22
M12	M24
M14	

NUTS

TENSILOCK - SELF LOCKING HEXAGON NUTS - STEEL



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



d	M5	M6	M8	M10	M12	M16
P	0.8	1	1.25	1.5	1.75	2
m	4.3	5.5	7	7.9	8.7	11.2
d2	8	10	13	15	17	22
dc	11.2	14.25	18.25	21	24	31

SIZE AVAILABLE					
d	d	d	d	d	d
M5	M6	M8	M10	M12 Class 10	M16 Class 10

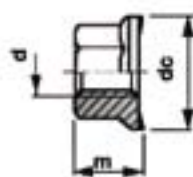
TECHNICAL DATA

Special features of TENSILOCK self-locking hexagon nuts.

- the flange has an elastic serrated edge.
- the serrated edge prevents loosening
- the smooth assembly face of the nut ensures an excellent clamping action.
- a washer is not necessary.

ASSEMBLY PRE-LOAD Fm in Kn and TIGHTENING TORQUES Ma in Nm													
Class 1	Connected material	M5		M6		M8		M10		M12		M16	
		Fm	MA	Fm	MA	Fm	MA	Fm	MA	Fm	MA	Fm	MA
8	Steel (500-1000 N/mm ²)	6.35	9	9	16	16.5	34	26.2	58	38.3	97	73	215
	Malleable iron	6.35	7	9	13	16.5	28	26.2	49	38.3	83	73	195
10	Steel (500-1000 N/mm ²)	9	12	12.6	21	23.2	44	37	75	54	120	102	280
	Malleable iron	9	9.5	12.6	16	23.2	36	37	64	54	105	102	260

HEXAGON FLANGE NUTS WITH TEETH STEEL ZINC PLATED



ISO : 4161
DIN : 6923
NEN : -
ANSI : -
BS : -
NF : E29 - 406

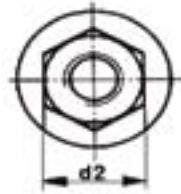
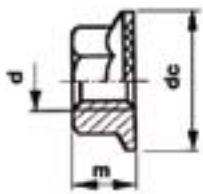


d	M5	M6	M8	M10	M10	M12	M14	M16
P	0.8	1	1.25	1.5	1.5	1.75	2	2
m (max)	5	6	8	10	10	12	14	18
d2	8	10	13	15	15	18	21	24
dc (max)	11.8	14.2	17.9	21.8	21.8	26	29.9	34.5

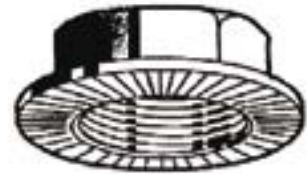
SIZE AVAILABLE						
d	d	d	d	d	d	d
M5	M6	M8	M10	M12	M14	M16

NUTS

RIPP - SELF LOCKING HEXAGON FLANGE NUTS - STEEL



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



d	M5	M6	M8	M10	M12	M16
P	0.8	1	1.25	1.5	1.75	2
m	4.3	5.5	7	8.5	10	14
d2	8	10	13	15	17	22
dc	11.2	14.2	18.25	21	24	31

SIZE AVAILABLE	
d	d
M5	M10
M6	M12
M8	M16

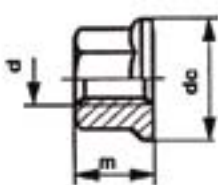
TECHNICAL DATA

Special features of RIPP self-locking hexagon flange nuts.

- the serrated flanges eliminates surface damage during assembly, prevents self loosening and reduce relaxation.
- the flanges enable built up forces under the nut to be spread over a larger area, consequently resulting in lower surface pressure
- large hole (oversized) and tooling holes can be covered by the flange.
- a washer is not necessary.

ASSEMBLY PRE-LOAD Fm in Kn and TIGHTENING TORQUES Ma in Nm													
Class	Connected material	M5		M6		M8		M10		M12		M16	
		Fm	MA	Fm	MA	Fm	MA	Fm	MA	Fm	MA	Fm	MA
10	Steel (500-800 N/mm ²)	9	11	12.6	19	23.2	42	37	85	54	130	102	330
	Steel (800-1100 N/mm ²)	9	10	12.6	18	23.2	37	37	80	54	120	102	310
	Malleable iron	9	9	12.6	17	23.2	35	37	75	54	115	102	300

HEXAGON FLANGE NUTS with SERRATION Steel Zinc and Yellow Passivated



ISO : 4161
DIN : 6923
NEN : -
ANSI : -
BS : -
NF : E29 -



d	M5	M6	M8	M10	M12	M14	M16	M20	M24
P	0.8	1	1.25	1.5	1.75	2	2.00	2.5	3
m (max)	5	6	8	10	12	14	18	20	30
d2	8	10	13	15	18	21	24	30	36
dc (max)	11.8	14.2	17.9	21.8	26	29.9	34.50	42.8	46

SIZE AVAILABLE				
d	d	d	d	d
M5	M6	M10	M14	M20
	M8	M12	M16	M24

NUTS

HEXAGON SLOTTED and CASTLE NUTS METRIC FINE PITCH THREAD - STEEL

$\leq M10$		$\geq M12$					
ISO	:	-					
DIN	:	935 - 1					
NEN	:	729					
ANSI	:	-					
BS	:	-					
NF	:	-					
d x P	M8x1	M10x1	M12x1.5	M14x1.5	M16x1.5	M18x1.5	M20x1.5
m	9.5	12	15	16	19	21	22
d2	13	17	19	22	24	27	30
n	2.5	2.8	3.5	3.5	4.5	4.5	4.5
d x P	M22x1.5	M24x1.5	M27x1.5	M30x1.5	M30x2	M36x1.5	
m	26	27	30	33	33	38	
d2	32	36	41	46	46	55	
n	5.5	5.5	5.5	7	7	7	
SIZE AVAILABLE							
d x P	M8 x 1.00	M12 x 1.50	M16 x 1.50	M20 x 1.50	M24 x 1.50	M30 x 1.50	M36 x 1.50
	M10 x 1.00	M14 x 1.50	M18 x 1.50	M22 x 1.50	M27 x 1.50	M30 x 2.00	

HEXAGON THIN, SLOTTED and CASTLE NUTS - STEEL

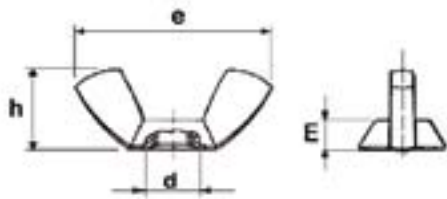
$\leq M10$		$\geq M12$					
ISO	:	-					
DIN	:	979					
NEN	:	-					
ANSI	:	-					
BS	:	-					
NF	:	-					
d	M6	M8	M10	M12	M14	M16	M18
P	1	1.25	1.5	1.75	2	2	2.5
m	5	6.5	8	10	11	13	15
d2	10	13	17	19	22	24	27
n	2	2.5	2.8	3.5	3.5	4.5	4.5
d	M20	M22	M24	M27	M30		
P	2.5	2.5	3	3	3.5		
m	16	18	19	22	24		
d2	30	32	36	41	46		
n	4.5	5.5	5.5	5.5	7		
SIZE AVAILABLE							
d	M6	M10	M14	M18	M22	M27	
	M8	M12	M16	M20	M24	M30	

HEXAGON THIN, SLOTTED and CASTLE NUTS METRIC FINE PITCH THREAD - STEEL

$\leq M10$		$\geq M12$					
ISO	:	-					
DIN	:	979					
NEN	:	-					
ANSI	:	-					
BS	:	-					
NF	:	-					
d x P	M8x1	M10x1	M12x1.5	M14x1.5	M16x1.5	M18x1.5	M20x1.5
m	6.5	8	10	11	13	15	16
d2	13	17.8	19	22	24	27	30
n	2.5	14.2	3.5	3.5	4.5	4.5	4.5
d x P	M22x1.5	M24x1.5	M27x1.5	M30x1.5	M30x2		
m	18	19	22	24	24		
d2	32	36	41	46	46		
n	5.5	5.5	5.5	7	7		
SIZE AVAILABLE							
d x P	M8 x 1.00	M12 x 1.50	M16 x 1.50	M20 x 1.50	M24 x 1.50	M30 x 1.50	M30 x 2.00
	M10 x 1.00	M14 x 1.50	M18 x 1.50	M22 x 1.50	M27 x 1.50	M30 x 1.50	

NUTS

WING BUTTERFLY NUTS LIGHT TYPE - Steel Zinc Plated



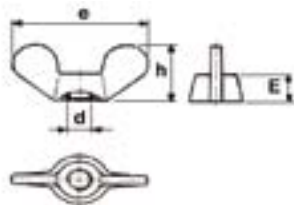
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DIN	:	-
NEN	:	-
ANSI	:	B18.17
BS	:	-
NF	:	-



d	M3	M4	M5	M6	M8	M10	M12	M16	M20
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2.5
E	3.3	3.3	3.8	4.7	5.6	6.3	7.5	10.7	12
e	18.7	18.7	22.5	27.2	30	35	47.6	62	66
h	8.6	8.6	10.5	12.7	14.6	16.7	22.3	30.8	30.5

SIZE AVAILABLE		
d	d	d
M3	M6	M12
M4	M8	M16
M5	M10	M20

WING BUTTERFLY NUTS - Cast Iron Zinc Plated



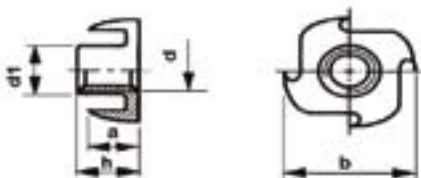
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DIN	:	315
NEN	:	1625
ANSI	:	-
BS	:	-
NF	:	-



d	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
P	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	3
E (min)	3.2	4	5	6.5	8	10	11.2	13	16	20
e (max.)	20	26	33	39	51	65	65	73	90	110
h (max.)	10.5	13	17	20	26	33.5	33.5	37.6	46	56.5

SIZE AVAILABLE		
d	d	d
M4	M10	M16
M5	M12	M20
M6	M14	M24

DRIVE-IN NUTS for WOOD - Steel and Steel Zinc Plated



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

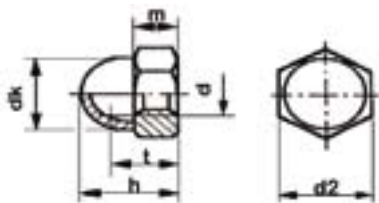


d	M3	M4	M5	M6	M8	M10
P	0.5	0.7	0.8	1	1.25	1.5
d1	43	5.6	6.5	7.5	9.9	11.6
h	5	5.7	8	9	11	13
a	3.5	5.2	6.2	7.2	8.6	9.5
b	13	15	17	19	22.2	25.5

SIZE AVAILABLE					
d1	d1	d1	d1	d1	d1
M3	M4	M5	M6	M8	M10

NUTS

HEXAGON DOMED CAP NUTS - Steel and Steel Zinc Plated



ISO : -
DIN : 1587
NEN : 1618
ANSI : -
BS : -
NF : -

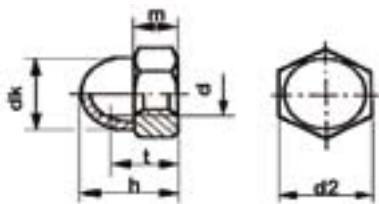


d	M3	M4	M5	M6	M7	M8	M10
P	0.5	0.7	0.8	1	1	1.25	1.50
m (max)	2.5	3.2	4	5	5.5	6.5	8
d2	5.5	7	8	10	11	13	17
h	6.6	8	10	12	13.5	15	18
dk (max)	5	6.5	7.5	9.5	10.5	12.5	16
t	4.5	5.5	7.5	8	10.5	11	13

d	M12	M14	M16	M18	M20	M22	M24
P	1.75	2	2	2.5	2.5	2.5	3.00
m (max)	10	11	13	15	16	18	19
d2	19	22	24	27	30	32	36
h	22	25	28	32	34	39	42
dk (max)	18	21	23	26	28	31	34
t	16	18	21	25	26	29	31

SIZE AVAILABLE		
d	d	d
M3	M8	M18
M4	M10	M20
M5	M12	M22
M6	M14	M24
M7	M16	

HEXAGON DOMED CAP NUTS with WELDED CAP Steel Chrome Plated



ISO : 4161
DIN : 1587
NEN : 1618
ANSI : -
BS : -
NF : -

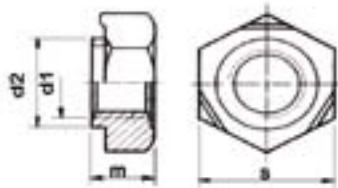


d	M4	M5	M6	M8	M10	M12	M16	M20
P	0.7	0.8	1	1.25	1.5	1.75	2	3
m (max)	3.2	4	5	6.5	8	10	13	16
d2	7	8	10	13	17	19	24	30
h	6	10	12	15	18	22	28	34
dk (max)	6.5	7.5	9.5	12.5	16	18	23	28
t	4	8	10	13	15	19	26	31

SIZE AVAILABLE		
d	d	d
M4	M8	M16
M5	M10	M20
M6	M12	

NUTS

HEXAGON WELD NUTS - STEEL



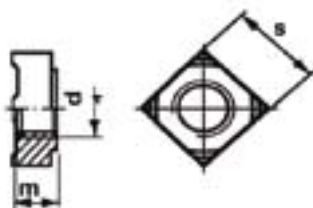
ISO : -
DIN : 929
NEN : -
ANSI : -
BS : -
NF : -



d1	M3	M4	M5	M6	M8	M10	M12	M14	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2
m (h14)	3	3.5	4	5	6.5	8	10	11	13
s(h13)	7.5	9	10	11	14	17	19	22	24
d2 (d11)	4.5	6	7	8	10.5	12.5	14.8	16.8	18.8

SIZE AVAILABLE						
d1	d1	d1	d1	d1	d1	d1
M4	M5	M6	M8	M10	M12	M14

SQUARE WELD NUTS - Steel



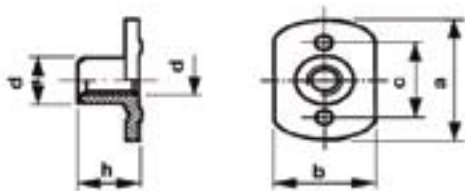
ISO : -
DIN : 928
NEN : -
ANSI : -
BS : -
NF : -



d1	M4	M5	M6	M8	M10	M12	M14
P	0.7	4.2	1	1.25	1.5	1.75	2
m (h14)	3.5	9	5	6.5	8	9.5	11
s (h14)	7	8	10	14	17	19	22

SIZE AVAILABLE						
d1	d1	d1	d1	d1	d1	d1
M4	M5	M6	M8	M10	M12	M14

SQUARE WELD NUTS - Steel



ISO : -
DIN : 928
NEN : -
ANSI : -
BS : -
NF : -

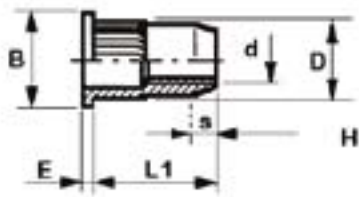


d	M4	M5	M6	M8	M10
P	0.7	0.8	1	1.25	1.5
d1	5.1	6.5	7.8	10.3	12
a	17	19	22	26	26
b	9	11	14	18	18
h	6	8	8.5	11	12
c	12	14	16	16	16

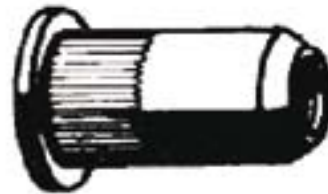
SIZE AVAILABLE				
d	d1	d1	d1	d1
M4	M5	M6	M8	M10

NUTS

BLIND RIVET NUTS with CYLINDRICAL HEAD and KNURLE Steel and Steel Zinc Plated & YELLOW Passivated



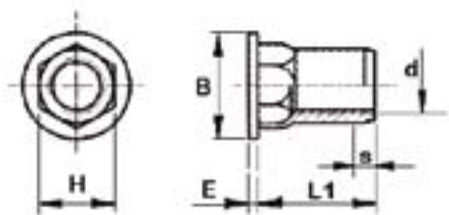
ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



Type	5PO20	5PO30	6PO15	6PO30	8PO20	8PO35
d	M5	M5	M6	M6	M8	M8
Grip range	1-2	3-Feb	0.7-1.5	1.5-3	1-2	2-3.5
D $\odot$	7	7	9	9	11	11
B	10	10	13	13	16	16
E	1	1	1.5	1.5	1.6	1.5
s $\odot$	3.5-2.5	3.5-2.5	3.5-2	3.5-2	4.7-3.2	4.7-3.2
L $\odot$	12	13	13	14.5	15.5	17

SIZE AVAILABLE		
Type	Type	Type
5PO20	6PO15	8PO20
5PO30	6PO30	8PO35

BLIND RIVET NUTS with CYLINDRICAL HEAD and HEX SHAFT Steel Zinc Plated, Yellow Passivated



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

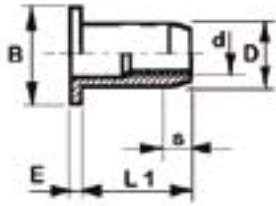


Type	4PO20	5PO30	6PO30	8PO30	10PO35
d	M4	M5	M6	M8	M10
Grip range	0.5-2	0.5-3	0.5-3	0.8-3	1-3.5
H	5.98	6.98	8.98	10.98	12.98
B	9	10	13	16	19
E	1	1	1.5	1.5	2
s $\odot$	3-1.5	4-1.5	4-1.5	5-2.5	5-2.5
L $\odot$	9.5	13	14.5	16.5	21
Hole hexagon	6+0.1	7+0.1	9+0.1	11+0.1	13+0.1

SIZE AVAILABLE		
Type	Type	Type
4PO20	6PO30	10PO35
5PO30	8PO30	

NUTS

BLIND RIVET NUTS with CYLINDRICAL HEAD Steel Zinc Plated, Yellow PassivatedA



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -

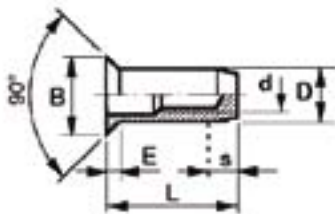


Type	3PO15	3PO30	3PO45	3PO60	4PO20	4PO40	4PO60	5PO30	5PO55	5PO80	6PO30	6PO55
d $\odot$	M3	M3	M3	M3	M4	M4	M4	M5	M5	M5	M6	M6
Grip range	1-1.5	1.5-3	3-4.5	4.5-6	1-2	2-4	4-6	0.25-3	3-5.5	5.5-8	0.5-3	3-5.5
D	5	5	5	5	6	6	6	7	7	7	9	9
B	7.5	7.5	7.5	7.5	9	9	9	10	10	10	13	13
E	1	1	1	1	1	1	1	1	1	1	1.5	1.5
s $\odot$	2.5-1.3	2.5-13	2.5-1.3	2.5-1.3	3.8-1.7	3.8-1.7	3.8-1.7	5.5-2.5	5.5-2.5	5.5-2.5	4.7-2.2	4.7-2.2
L $\odot$	7.5	9	10.5	12	9	11	13	13	16	19	14.5	17.5

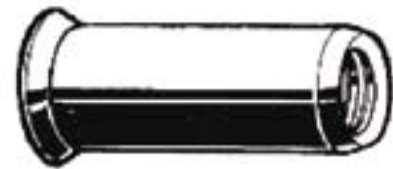
Type	6PO80	8PO30	8PO55	8PO80	8PO105	10PO35	10PO60	10PO85	10PO110	12PO40	12PO70	12PO100
d $\odot$	M6	M8	M8	M8	M8	M10	M10	M10	M10	M12	M12	M12
Grip range	5.5-8	0.5-3	3-5.5	5.5-8	8-10.5	1-3.5	3.5-6	6-8.5	8.5-11	1-4	4-7	7-10
D	9	11	11	11	11	13	13	13	13	16	16	16
B	13	16	16	16	16	19	19	19	19	23	23	23
E	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2
s $\odot$	4.7-22	5.5-3	5.5-3	5.5-3	5.5-3	5.8-3.3	5.8-3.3	5.8-3.3	5.8-3.3	6.5-3.7	6.5-3.7	6.5-3.7
L $\odot$	20.5	16.5	19.5	22.5	25.5	21	24	27	30	25	28	31

SIZE AVAILABLE												
Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type
3PO15	3PO45	4PO20	4PO60	5PO30	5PO80	6PO55	8PO30	8PO80	10PO35	10PO85	12PO40	12PO100
3PO30	3PO60	4PO40		5PO65	6PO30	6PO80	8PO55	8PO105	10PO60	10PO110	12PO70	

BLIND RIVET NUTS with COUNTERSUNK HEAD Steel Zinc Plated, Yellow Passivated



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



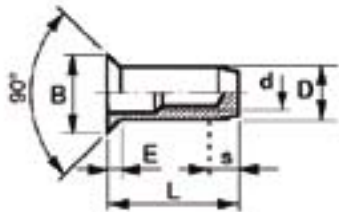
Type	3FO30	3FO45	3FO60	4FO30	4FO50	4FO70	5FO40	5FO65	5FO90	6FO40
d $\odot$	M3	M3	M3	M4	M4	M4	M5	M5	M5	M6
Grip range	1.5-3	3-4.5	4.5-6	1.5-3	3-5	5-7	1.5-4	4-6.5	6.5-9	1.5-4
D	5	5	5	6	6	6	7	7	7	9
B	7.2	7.2	7.2	8.2	8.2	8.2	9.6	9.6	9.6	11.7
E	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.6	1.6	1.6
s $\odot$	2.5-13	2.5-1.3	2.5-1.3	3.8-1.7	3.8-1.7	3.8-1.7	5.5-2.5	5.5-2.5	5.5-2.5	4.7-2.2
L	9	10.5	12	10	12	14	14	17	20	16

Type	6FO65	6FO90	8FO40	8FO65	8FO90	10FO40	10FO65	12FO45	12FO75	12FO105
d $\odot$	M6	M6	M8	M8	M8	M10	M10	M12	M12	M12
Grip range	4-6.5	6.5-9	1.5-4	4-6.5	6.6-9	1.5-4	4-6.5	1.7-4.5	4.5-7.5	7.5-10.5
D	9	9	11	11	11	13	13	16	16	16
B	11.7	11.7	13.5	13.5	13.5	15.5	15.5	19	19	19
E	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.8	1.8	1.8
s $\odot$	4.7-22	4.7-2.2	5.5-3	5.5-3	5.5-3	5.8-3.3	5.6-3.3	6.5-3.7	6.5-3.7	6.5-3.7
L	19	22	18	21	24	22	25	26	29	32

SIZE AVAILABLE						
Type	Type	Type	Type	Type	Type	Type
3FO30	4FO30	5FO40	6FO40	8FO40	10FO40	12FO45
3FO45	4FO60	5FO65	6FO40	8FO40	10FO65	12FO75
3FO50	4FO70	5FO90	6FO40	8FO90		12FO105

NUTS

BLIND RIVET NUTS with COUNTERSUNK HEAD - ALUMINUM



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



Type	3FO30	3FO400	3FO50	4fFO35	4FO250	4FO400
d⌀	M3	M3	M3	M4	M4	M4
Grip range	1.5-3	3-4.5	3.5-5	1.5-3.5	1.75-2.5	3.25-4
D	5	5	5	6	6	6
B	7.2	7.2	7.2	8.2	8.2	8.2
E	1.4	1.4	1.4	1.4	1.4	1.4
s⌀	3-1	1.7-1	3-1	3.8-1.3	2-13	2-1.3
L	10.2	10.6	11.8	11.3	102	11.7

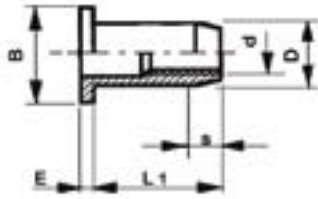
Type	4FO50	5FO45	5FO500	5FO65	6FO45	6FO65
d⌀	M4	M5	M5	M5	M6	M6
Grip range	3.5-5	1.5-4.5	4-5	4.5-6.5	1.5-4.5	4.5-6.5
D	6	7	7	7	9	9
B	8.2	9.6	9.6	9.6	11.7	11.7
E	1.4	1.6	1.6	1.6	1.6	1.6
s⌀	3.3-1.3	4.5-1.5	3-15	4.5-1.5	4.8-1.8	4.8-1.8
L	12.9	14.2	14.8	16.3	16.6	18.7

Type	8FO45	8FO65	10FO45	10FO450	10FO65
d⌀	M8	M8	M10	M10	M10
Grip range	1.5-4.5	4.5-6.5	3-4.5	3-4.5	4.5-6.5
D	11	11	13	13	13
B	13.5	13.5	15.5	15.5	15.5
E	1.6	1.6	1.6	1.6	1.6
s⌀	6-3	6-3	4.5-3	4.5-3	6-3
L	20.1	22.2	24	24	26.1

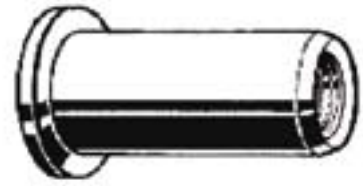
SIZE AVAILABLE		
Type	Type	Type
3 FO 35	4 FO 50	8 FO 45
3 FO 400		8 FO 65
3 FO 50	5 FO 45	
	5 FO 500	10 FO 45
4 FO 35	5 FO 65	10 FO 450
4 FO 250		10 FO 65
4 FO 400	6 FO 45	
	6 FO 65	

NUTS

BLIND RIVET NUTS with CYLINDRICAL HEAD - ALUMINUM



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -

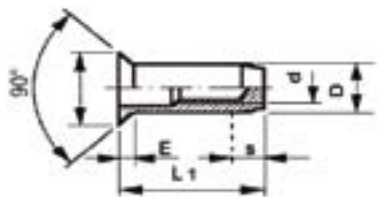


Type	3PO20	3PO35	4PO25	4PO45	5PO30	5PO200	5PO300	5PO55	6PO30
d $\varnothing$	M3	M3	M4	M4	M5	M5	M5	M5	M6
Grip range	0.25-2	2-3.5	0.25-2.5	2.5-4.5	0.25-3	1-2	2-3	3-5.5	0.5-3
D	5	5	6	6	7	7	7	7	9
B	7.5	7.5	9	9	10	10	10	10	13
E	1	1	1	1	1	1	1	1	1.5
s $\varnothing$	2.7-1	2.7-1	3.7-2.5	3.7-2.5	4.2-1.5	3-1.5	3-1.5	4.2-1.5	4.8-1.8
L $\varnothing$	8.6	10.2	10	12.1	12.6	11.5	12.6	15.2	15.1

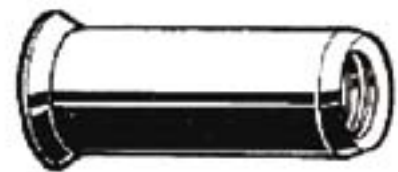
Type	6PO55	8PO150	8PO30	8PO55	8PO600	10PO150	10PO35	10PO60	10PO600
d $\varnothing$	M6	M6	M8	M8	M8	M10	M10	M10	M10
Grip range	3-5.5	0.5-1.5	0.5-3	3-5.5	4.5-6	0.5-1.5	0.8-3.5	3.5-6	4.5-6
D	9	11	11	11	11	18	13	13	13
B	13	16	16	16	16	19	19	19	19
E	1.5	1.5	1.5	1.5	1.5	2	2	2	2
s $\varnothing$	4.8-1.8	4.5-3	5.5-3	5.5-3	4.5-3	4.5-3	5.7-3	5.7-3	4.5-3
L $\varnothing$	17.8	16.9	18.5	21.2	21.7	20.8	23	25.7	25.6

SIZE AVAILABLE		
Type	Type	Type
3 PO 20	5 PO 300	8 PO 55
3 PO 35	5 PO 55	8 PO 600
4 PO 25	6 PO 80	10PO 150
4 PO 45	6 PO 55	10 PO 35
		10 PO 360
5 PO 30	8 PO 150	10 PO 600
5 PO 200	8 PO 30	

BLIND RIVET NUTS with COUNTERSUNK HEAD - STAINLESS STEEL



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



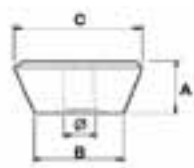
Type	4FO175	4FO250	5FO200	5FO300	6FO300	6FO450	8FO300	10FO300	10FO450	10FO600
d	M4	M4	M5	M5	M6	M6	M8	M10	M10	M10
Grip range	1.3-1.75	1.75-2.5	1.5-2	2-3	1.5-3	3-4.5	1.5-3	1.5-3	3-4.5	4.5-6
D	6	6	7	7	9	9	11	13	13	13
B	8	8	9	9	11	11	13.6	16	16	16
E	1.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
s $\varnothing$	1.5-0.7	1.5-0.7	2-1	1-Feb	2.5-1	2.5-1	3-1.5	3-1.5	3-1.5	3-1.5
L	9.2	10	11.6	12.7	15	16.6	16.5	20.4	22	23.6

SIZE AVAILABLE		
Type	Type	Type
4FO175	6FO300	10FO300
4FO250	6FO450	10FO450
5FO200		10FO600
5FO300	8FO300	

NUTS

Duct fixing products

wedge NUT - electro Galvanized or Yellow Zinc Plated



ISO : -
DIN : 582
NEN : 1928
ANSI : -
BS : -
NF : -



Reference	Ø	A mm	B mm	C mm	W mm
WIN 06	M 6	13	19	25	12
WIN 08	M 8	13	19	25	12
WIN 10	M 10	13	19	25	12

PLAIN CHANNEL STRUT NUTS - zinc Plated



SIZE AVAILABLE		
Reference	SIZE	THICKNESS
PC 0606	M 6	6 MM
PC 0806	M 8	6 MM
PC 1008	M 10	8 MM
PC 1208	M 12	8 MM
PC 0808	M 8	8 MM
PC 1010	M 10	10 MM
PC 1210	M 12	10 MM
PC 1212	M 12	12 MM

CHANNEL STRUT NUTS with SHORT SPRING - zinc Plated



SIZE AVAILABLE		
Reference	SIZE	THICKNESS
CSS 0606	M 6	6 MM
CSS 0806	M 8	6 MM
CSS 1008	M 10	8 MM
CSS 1208	M 12	8 MM
CSS 0808	M 8	8 MM
CSS 1010	M 10	10 MM
CSS 1210	M 12	10 MM
CSS 1212	M 12	12 MM

CHANNEL STRUT NUTS with LONG SPRING - zinc Plated



SIZE AVAILABLE		
Reference	SIZE	THICKNESS
CSL 0606	M 6	6 MM
CSL 0806	M 8	6 MM
CSL 1008	M 10	8 MM
CSL 1208	M 12	8 MM
CSL 0808	M 8	8 MM
CSL 1010	M 10	10 MM
CSL 1210	M 12	10 MM
CSL 1212	M 12	12 MM



WASHERS COLLECTION

177 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV and Steel 140HV Zinc Plated



177 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV Zinc Plated, Yellow and Black Passivated



178 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV DACROMET 500 LC - Steel , Zinc Plated, Stainless Steel & Black



178 PLAIN WASHER WITHOUT CHAMFER
Steel 200HV Zinc Plated, Stainless Steel & Black



178 PLAIN WASHER WITHOUT CHAMFER
Steel 200HV DACROMET 500 LC



179 PLAIN WASHER $d_2 = 3 \times d_1$
STEEL ZINC PLATED Yellow Passivated



179 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV Zinc Plated, Yellow and Black Passivated



180 SHIM RINGS - STEEL
SHIM RINGS - Thickness $s = 0.1$



180 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV Zinc Plated, Yellow and Black Passivated



180 PLAIN WASHER WITHOUT CHAMFER
Steel 140HV Zinc Plated, Yellow and Black Passivated



181 SHIM RINGS - STEEL
SHIM RINGS - Thickness $s = 1.0$



181 PRECISION FOIL LAYER - Stainless Steel A2



182 PLAIN WASHER - Steel Zinc Plated and Hot Dip Galvanized



182 WASHER FOR STEEL CONSTRUCTIONS
Steel Zinc Plated and Hot Dip Galvanized



183 PLAIN WASHER for CLEVIS PINS
Steel Zinc Plated



183 PLAIN WASHER for CHEESE HEAD SCREW
Steel Zinc Plated



184 SQUARE WASHER for WOOD CONSTRUCTIONS
Steel Zinc Plated and Steel Hot Dip Galvanized



184 SQUARE TAPER WASHER 8% for U SECTIONS
Steel Hot Dip Galvanized, Zinc Plated



184 SQUARE TAPER WASHER .14% for U SECTIONS
Steel Hot Dip Galvanized, Zinc Plated



CONTENTS

185 ADJUSTING RINGS With SOCKET SET SCREW - Steel



185 ADJUSTING RINGS With SLOTTED SET SCREW - Steel



186 DISC SPRING - FOR CRITICAL APPLICATIONS
Type A (HEAVY) - Steel Phosphated



186 DISC SPRING - FOR CRITICAL APPLICATIONS
Type B (MEDIUM) - Steel Phosphated



187 SPRING LOCK WASHERS with SQUARE ENDS
Steel Zinc Plated, Balck & HOT DIP Galvanized, YELLOW



187 SPRING LOCK WASHERS with SQUARE ENDS Steel Zinc
PL. YELLOW Passivated & Steel HOT DIP Galvanized, Black & zink plated



188 CURVED SPRING LOCK WASHERS - STEEL ZINC PLATED



188 DOUBLE COIL SPRING LOCK WASHERS - STEEL



189 SPRING LOCK WASHERS for SCREWS with CYLINDRICAL HEADS
Steel and Steel Zinc Plated



189 CONTACT SPRING WASHERS for SWITCH GEAR PLANTS
STEEL ZINC PLATED



190 WAVE WASHERS (CURVE SHAPE) - STEEL and STEEL ZINC PLATED
YELLOW PASSIVATED



190 WAVE (SPRING TYPE) WASHERS - STEEL and STEEL ZINC PLATED
YELLOW PASSIVATED



191 NORD-LOCK LOCK WASHERS - STEEL ZINC PLATED
YELLOW PASSIVATED



192 CONTACT-LOCK WASHER - Type Medium
Steel Zinc Plated YELLOW PASSIVATED



192 CONTACT-LOCK WASHER - Type P
Steel Zinc Plated YELLOW PASSIVATED



193 TOOTHED LOCK WASHER EXTERNAL TEETH
STEEL ZINC PLATED



193 TOOTHED LOCK WASHERS INTERNAL TEETH
STEEL ZINC PLATED



194 SERRATED LOCK WASHER EXTERNAL TEETH - STEEL
STEEL ZINC PLATED, YELLOW PASSIVATED



194 SERRATED LOCK WASHER INTERNAL TEETH
STEEL and STEEL ZINC PLATED, YELLOW PASSIVATED



195 COUNTERSUNK SERRATED LOCK WASHERS EXTERNAL TEETH
STEEL ZINC PLATED



CONTENTS

195 DOUBLE SERRATED LOCK WASHERS - STEEL ZINC PLATED



195 HEAVY DOMED INTERNAL SERRATED LOCK WASHER - STEEL



196 RETAINING RINGS for BORES - NORMAL TYPE - STEEL



197 RETAINING RINGS for BORES - NORMAL TYPE - STEEL



198 RETAINING RINGS for BORES - NORMAL TYPE - STEEL



199 RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



200 RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



201 RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



202 RETAINING WASHER for SHAFT - STEEL



202 STARLOCK - FIXING WASHER for SHAFTS (without CAP)
STEEL , Stainless Steel

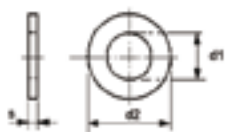


203 STARLOCK - FIXING WASHER for SHAFTS (with CAP type A)
STEEL & STAINLESS STEEL



WASHERS

PLAIN WASHER WITHOUT CHAMFER Steel 140HV and Steel 140HV Zinc Plated



ISO : 7089
DIN : 125-1 A
NEN : 2269 A
ANSI : -
BS : -
NF : -



For nom.	M3	M4	M5	M6	M7	M8	M10	M12	M14
Size	-	5/32	3/16	-	9/32	5/16	3/8	1/2	9/16
d1	3.2	4.3	5.3	6.4	7.4	8.4	10.5	13	15
d2	7	9	10	12	14	16	20	24	28
s	0.5	0.8	1	1.6	1.6	1.6	2	2.5	2.5

For nom.	M16	M18	M20	M22	M24	M27	M30	M33
Size	5/8	11/16	3/4	7/8	-	1	1 1/8	1 1/4
d1	17	19	21	23	25	28	31	34
d2	30	34	37	39	44	50	56	60
s	3	3	3	3	4	4	4	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M1.6	M10	M33
M2	M11	M36
M2.5	M12	M39
M2.6	M14	M42
M3	M16	M45
M4	M18	M48
M5	M20	M52
M6	M22	M56
1/4	M24	M60
M7	M27	M64
M8	M30	

PLAIN WASHER WITHOUT CHAMFER Steel 140HV Zinc Plated, Yellow and Black Passivated

For nom.	M3	M4	M5	M6	M7	M8	M10	M12	M14
Size	-	5/32	3/16	-	9/32	5/16	3/8	1/2	9/16
d1	3.2	4.3	5.3	6.4	7.4	8.4	10.5	13	15
d2	7	9	10	12	14	16	20	24	28
s	0.5	0.8	1	1.6	1.6	1.6	2	2.5	2.5

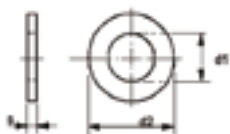
For nom.	M16	M18	M20	M22	M24	M27	M30	M33
Size	5/8	11/16	3/4	7/8	-	1	1 1/8	1 1/4
d1	17	19	21	23	25	28	31	34
d2	30	34	37	39	44	50	56	60
s	3	3	3	3	4	4	4	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M1.6	M10	M33
M2	M11	M36
M2.5	M12	M39
M2.6	M14	M42
M3	M16	M45
M4	M18	M48
M5	M20	M52
M6	M22	M56
1/4	M24	M60
M7	M27	M64
M8	M30	

WASHERS

PLAIN WASHER WITHOUT CHAMFER

Steel 140HV DACROMET 500 LC - Steel , Zinc Plated, Stainless Steel & Black



ISO	:	7089
DIN	:	125-1 A
NEN	:	2269 A
ANSI	:	-
BS	:	-
NF	:	-



For nom.	M6	M8	M10	M12	M16
Size	-	5/16	3/8	1/2	5/8
d1	6.4	8.4	10.5	13	17
d2	12	16	20	24	30
s	1.6	1.6	2	2.5	3

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M6	M10	M16
M8	M12	

PLAIN WASHER WITHOUT CHAMFER

Steel 200HV Zinc Plated, Stainless Steel & Black

For nom.	M6	M8	M10	M12	M14	M16	M18	M20	M24	M27	M30	M33	M36
Size	-	5/16	3/8	1/2	9/16	5/8	1 1/16	3/4	-	1	1 1/8	1 1/4	1 3/8
d1	6.4	8.4	10.5	13	15	17	19	21	25	28	31	34	37
d2	12	16	20	24	28	30	34	37	44	50	56	60	66
s	1.6	1.6	2	2.5	2.5	3	3	3	4	4	4	5	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M6	M16	M27
M8	M18	M30
M10	M20	M33
M12	M24	M36
M14		

PLAIN WASHER WITHOUT CHAMFER

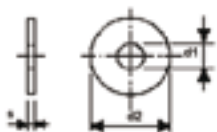
Steel 200HV DACROMET 500 LC

For nom.	M6	M8	M10	M12	M16
Size	-	5/16	3/8	1/2	5/8
d1	6.4	8.4	10.5	13	17
d2	12	16	20	24	30
s	1.6	1.6	2	2.5	3

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M6	M10	M16
M8	M12	

WASHERS

PLAIN WASHER d2 = 3 x d1 STEEL ZINC PLATED, Yellow Passivated



ISO : 7093
DIN : 9021
NEN : 2276
ANSI : -
BS : -
NF : E25-513



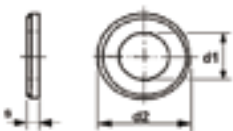
For nom.	M3	M3.5	M4	M5	M6	M7	M8
Size	-	1 / 8	5/32	3/16	-	9/32	5/16
d1 (max.)	3.2	3.7	4.3	5.3	6.4	7.4	8.4
d2 (max.)	7	11	12	15	18	22	25(25)
s	0.5	0.8	1	1,2 (1.6)	1.6	2	2

For nom.	M10	M12	M14	M16	M18	M20	M22
Size	3/8	1/2	9/16	5/8	11/16	3/4	-
d1 (max.)	10.5	13	15	17	20 (19)	22 (21)	26
d2 (max.)	20	37 (40)	44 (45)	50	56	60	72
s	2	3	3	3	4	4	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M7	M16
M3.5	M8	M18
M4	M10	M20
M5	M14	M24

PLAIN WASHER WITHOUT CHAMFER

Steel 140HV Zinc Plated, Yellow and Black Passivated



ISO : 7090
DIN : 1251-1 B
NEN : 2269 B
ANSI : -
BS : -
NF : -



For nom.	M5	M6	M7	M8	M10	M12	M14	M16
Size	3/16	-	9/32	5/16	3/8	1/2	9/16	5/8
d1	5.3	6.4	7.4	8.4	10.5	13	15	17
d2	10	12	14	16	20	24	28	30
s	1	1.6	1.6	1.6	2	2.5	2.5	3

For nom.	M18	M20	M22	M24	M27	M30	M33	M36
Size	11/16	3/4	7/8	-	1	1 1/8	1 1/4	1 3/8
d1	19	21	23	25	28	31	34	37
d2	34	37	39	44	50	56	60	66
s	3	3	3	4	4	4	5	5

For nom.	M39	M42	M45	M48	M52	M56	M60	M64
Size	1 1/2	1 5/8	1 3/4	-	2	2 1/4	-	2 1/2
d1	40	43	46	50	54	58	62	66
d2	72	78	85	92	98	105	110	115
s	6	7	7	8	8	9	9	9

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M5	M18	M39
M6	M20	M42
M7	M22	M45
M8	M24	M48
M10	M27	M52
M12	M30	M56
M14	M33	M60
M16	M36	M64

WASHERS

SHIM RINGS - STEEL



General:

- SHIM RINGS - Thickness $s = 0.1$
- These sizes are not DIN Standard

SIZE AVAILABLE	
d1 x d2	d1 x d2
8 x 20	22 x 34
10 x 22	24 x 36
12 x 24	26 x 38
14 x 26	28 x 40
16 x 28	30 x 42
18 x 30	32 x 44
18 x 32	34 x 46
	36 x 48
	38 x 50
	40 x 50

PLAIN WASHER WITHOUT CHAMFER

Steel 140HV Zinc Plated, Yellow and Black Passivated



General:

- SHIM RINGS - Thickness $s = 0.3$
- According to DIN 988

SIZE AVAILABLE	
d1 x d2	d1 x d2
3 x 6	20 x 28
4 x 8	22 x 32
5 x 10	25 x 35
6 x 12	26 x 37
8 x 14	28 x 40
10 x 16	30 x 42
12 x 18	32 x 45
14 x 20	35 x 45
16 x 22	36 x 45
18 x 25	37 x 47
	40 x 50

PLAIN WASHER WITHOUT CHAMFER

Steel 140HV Zinc Plated, Yellow and Black Passivated



General:

- SHIM RINGS - Thickness $s = 0.5$
- SHIM According to DIN 988

SIZE AVAILABLE	
d1 x d2	d1 x d2
3 x 6	20 x 28
4 x 8	22 x 32
5 x 10	25 x 35
6 x 12	26 x 37
8 x 14	28 x 40
10 x 16	30 x 42
12 x 18	32 x 45
14 x 20	35 x 45
16 x 22	36 x 45
18 x 25	37 x 47
	40 x 50

WASHERS

SHIM RINGS - STEEL



General:

- SHIM RINGS - Thickness $s = 1.0$
- SHIM According to DIN 988 Standard

SIZE AVAILABLE	
d1 x d2	d1 x d2
3 x 6	20 x 28
4 x 8	20 x 32
5 x 10	22 x 32
6 x 12	25 x 35
8 x 14	26 x 37
	28 x 40
10 x 16	30 x 42
12 x 18	
12 x 24	
14 x 20	
16 x 22	
18 x 25	



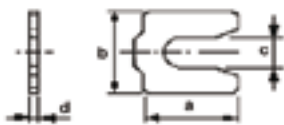
General:

- SHIM RINGS - Thickness $s = 1.0$
- This size are not DIN Standard

SIZE AVAILABLE
d1 x d2
32 x 45
35 x 45
36 x 45
37 x 47
40 x 50

PRECISION FOIL LAYER - Stainless Steel A2

EXAMPLE OF APPLICATION



ISO : -
 DIN : -
 NEN : -
 ANSI : -
 BS : -
 NF : -

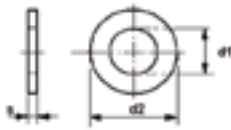


a	55	75	90	125
b	50	70	80	105
c	15	23	32	44

SIZE AVAILABLE		
a x b x d	a x b x d	a x b x d
55 x 50 x 0.05mm	75 x 70 x 0.20mm	90 x 80 x 1.00mm
55 x 50 x 0.10mm	70 x 70 x 0.50mm	90 x 80 x 2.00mm
55 x 50 x 0.20mm	75 x 70 x 1.00mm	
55 x 50 x 0.50mm	70 x 70 x 2.00mm	125 x 105 x 0.05mm
55 x 50 x 1.00mm		125 x 105 x 0.10mm
55 x 50 x 2.00mm	90 x 80 x 0.05mm	125 x 105 x 0.20mm
	90 x 80 x 0.10mm	125 x 105 x 0.50mm
75 x 70 x 0.05mm	90 x 80 x 0.20mm	125 x 105 x 1.00mm
70 x 70 x 0.10mm	90 x 80 x 0.50mm	125 x 105 x 2.00mm

WASHERS

PLAIN WASHER - Steel and Steel Hot Dip Galvanized



ISO	:	7091
DIN	:	126
NEN	:	2268
ANSI	:	-
BS	:	-
NF	:	E25-513



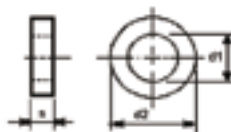
For nom.	M5	M6	M8	M10	M12	M16	M20	M22
Size	3/16	1/4	5/16	3/8	7/16	5/8	3/4	7/8
d1	5.3	6.60	9	11	13.5 (14)	17.5 (18)	22	24
d2	10	12	16 (17)	20 (21)	24	30	37	39
s	1	1.6	1.6	2	2.5	3	3	3

For nom.	M24	M27	M30	M33	M36	M39	M42	M45
Size	-	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4
d1	26	30	33	34	39	42	45	48
d2	44	50	56	60	66	72	78	85
s	4	4	4	5	5	6	7	7

For nom.	M48	M52	M56	M60	M64	M72	M80	M90
Size	-	2	2 1/4	-	2 1/2	2 3/4	-	3 1/2
d1	52	56	62	66	70	78	86	96
d2	92	98	105	110	115	125	140	160
s	8	8	9	9	9	10	12	12

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M5	M24	M48
M6	M27	M52
M8	M30	M56
M10	M33	M60
M12	M36	M64
M16	M39	M72
M20	M42	M80
M22	M45	M90

WASHER FOR STEEL CONSTRUCTIONS Steel Zinc Plated and Hot Dip Galvanized



ISO	:	-
DIN	:	7969
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

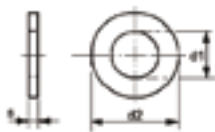


For nom.	M10	M12	M16	M20	M24	M27	M30	M33	M36
Size	3/8	1/2	5/8	3/4	-	1	1 1/8	1 1/4	1 3/8
d1	10.5	13	17.5 (18)	22	26	30	33	34	39
d2	20	24	30	37	44	50	56	60	66
s	2	2.5	3	3	4	4	4	5	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M10	M20	M30
M12	M24	M33
M16	M27	M36

WASHERS

PLAIN WASHER for CLEVIS PINS Steel Zinc Plated



ISO	:	8738
DIN	:	1440
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

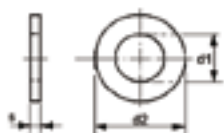


d1 (H11)	4	5	6	8	10	12	14	16
d2	8	10	12	16	20	25	28	28
s	0.8	0.8	1.6	2	2.5	3	3	3

d1 (H11)	18	20	22	23	25	26	28	30
d2	30	32	34	36	40	40	42	45
s	4	4	4	4	4	5	5	5

SIZE AVAILABLE		
d1	d1	d1
4MM	14MM	23MM
5MM	16MM	25MM
6MM	18MM	26MM
8MM	20MM	28MM
10MM	22MM	30MM
12MM		

PLAIN WASHER for CHEESE HEAD SCREW Steel Zinc Plated



ISO	:	7092
DIN	:	433
NEN	:	2270
ANSI	:	-
BS	:	-
NF	:	-



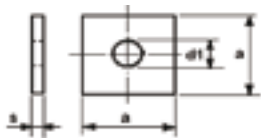
For nom.	M2	M2.6	M3	M4	M5	M6	M8	M10
Size	-	-	-	5/32	3/16	-	5/16	3/8
d1	2.2	2.8	3.2	4.3	5.3	6.4	8.4	10.5
d2	4.5	5.5	6	8	9 (9.5)	11	15	18
s	0.3 (0.5)	0.5	0.5	0.5	1	1.6	1.6	1.6

For nom.	M12	M14	M16	M18	M20
Size	1/2	9/16	5/8	-	3/4
d1	13	15	17	19	21
d2	20	24	28 (27)	30	34 (33)
s	2	2.5 (2)	2.5 (2)	2.5	3 (2.5)

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M2	M6	M14
M2.6	M8	M16
M3	M10	M18
M4	M12	M20
M5		

WASHERS

SQUARE WASHER for WOOD CONSTRUCTIONS Steel Zinc Plated and Steel Hot Dip Galvanized



ISO	:	-
DIN	:	436
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



For nom.	M8	M10	M12	M16	M20	M22	M24	M27	M30
size	5/16	3/8	1/2	5/8	3/4	7/8	1	-	1 1/8
d1	9	11	14	18	22	24	26	30	33
a	30	30	40	50	60	70	80	90	95
s	3	3	4	5	5	6	6	6	6

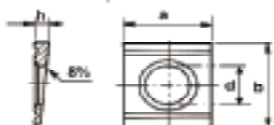
Steel and Steel Zinc Plated

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M8	M10	M22
M10	M20	M24
M12		

Hot Dip Galvanized

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M8	M10	M22
M10	M20	M24
M12		

SQUARE TAPER WASHER 8% for U SECTIONS Steel Hot Dip Galvanized, Zinc Plated



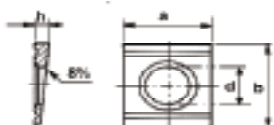
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DIN	:	434
NEN	:	2272
ANSI	:	-
BS	:	-
NF	:	-



For nom.	M8	M10	M12	M16	M20	M22	M24	M27	M30	M33
size	5/16	3/8	1/2	5/8	3/4	7/8	1	-	1 1/8	1 1/4
d	9	11	14	18	22	24	26	30	33	36
a	22	22	26	32	40	44	56	56	62	68
b	22	22	30	36	44	50	56	56	62	68
h	3.8	3.8	4.9	5.9	7	8	8.5	8.5	9	9

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M8	M20	M27
M10	M22	M30
M12	M24	M33
M16		

SQUARE TAPER WASHER .14% for U SECTIONS Steel Hot Dip Galvanized, Zinc Plated



ISO	:	-
DIN	:	434
NEN	:	2273
ANSI	:	-
BS	:	-
NF	:	-

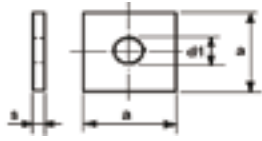


For nom.	M8	M10	M12	M16	M20	M22	M24	M27	M30	M33
size	5/16	3/8	1/2	5/8	3/4	7/8	1	-	1 1/8	1 1/4
d	9	11	14	18	22	24	26	30	33	36
a	22	22	26	32	40	44	56	56	62	68
b	22	22	30	36	44	50	56	56	62	68
h	3.8	3.8	4.9	5.9	7	8	8.5	8.5	9	9

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M8	M20	M27
M10	M22	M30
M12	M24	M33
M16		

WASHERS

ADJUSTING RINGS With SOCKET SET SCREW - Steel



ISO : -
DIN : 705 A/ 916
NEN : -
ANSI : -
BS : -
NF : -



d1	3	4	5	6	7	8	9	10	11	12	14	15	16	18
d2	7	8	10	12	12	16	18	20	20	22	25	25	28	32
b	5	5	6	8	8	8	10	10	10	12	12	12	12	14
d3	M2	M2.5	M3	M4	M4	M4	M5	M5	M5	M6	M6	M6	M6	M6

d1	20	22	24	25	26	28	30	32	34	35	36	38	40
d2	32	36	40	40	40	45	45	50	50	56	56	56	63
b	14	14	16	16	16	16	16	16	16	16	16	16	18
d3	M6	M6	M8	M8	M8	M8	M8	M8	M8	M8	M8	M8	M6

d1	42	45	48	50	55	56	58	60	63	65	70	75	80
d2	63	70	70	80	80	80	90	90	20	22	25	25	28
b	18	18	18	18	18	18	20	20	10	12	12	12	12
d3	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M12	M12

SIZE AVAILABLE		
d1 x d2 x b	d1 x d2 x b	d1 x d2 x b
3 x 7 x 5mm	20 x 32 x 14mm	42 x 63 x 18mm
4 x 8 x 5mm	22 x 36 x 14mm	45 x 70 x 18mm
5 x 10 x 6mm	24 x 40 x 16mm	48 x 70 x 18mm
6 x 12 x 8mm	25 x 40 x 16mm	50 x 80 x 18mm
7 x 12 x 8mm	26 x 40 x 16mm	55 x 80 x 18mm
8 x 16 x 8mm	28 x 45 x 16mm	56 x 80 x 18mm
9 x 18 x 10mm	30 x 45 x 16mm	58 x 90 x 20mm
10 x 20 x 10mm	32 x 50 x 16mm	60 x 90 x 20mm
11 x 20 x 10mm	34 x 50 x 16mm	63 x 90 x 20mm
12 x 22 x 12mm	35 x 56 x 16mm	65 x 100 x 20mm
14 x 25 x 12mm	36 x 56 x 16mm	70 x 100 x 20mm
15 x 25 x 12mm	38 x 56 x 16mm	75 x 110 x 22mm
16 x 28 x 12mm	40 x 63 x 18mm	80 x 110 x 22mm
18 x 32 x 14mm		

ADJUSTING RINGS With SLOTTED SET SCREW - Steel



ISO : -
DIN : 705 A/ 553
NEN : -
ANSI : -
BS : -
NF : -



d1	3	4	5	6	7	8	9	10	11	12	14	15	16	18
d2	7	8	10	12	12	16	18	20	20	22	25	25	28	32
b	5	5	6	8	8	8	10	10	10	12	12	12	12	14
d3	M2	M2.5	M3	M4	M4	M4	M5	M5	M5	M6	M6	M6	M6	M6

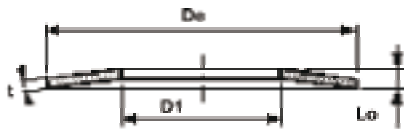
d1	20	22	24	25	26	28	30	32	34	35	36	38	40
d2	32	36	40	40	40	45	45	50	50	56	56	56	63
b	14	14	16	16	16	16	16	16	16	16	16	16	18
d3	M6	M6	M8	M8	M8	M8	M8	M8	M8	M8	M8	M8	M6

d1	42	45	48	50	55	56	58	60	63	65	70	75	80
d2	63	70	70	80	80	80	90	90	20	22	25	25	28
b	18	18	18	18	18	18	20	20	10	12	12	12	12
d3	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M10	M12	M12

SIZE AVAILABLE		
d1 x d2 x b	d1 x d2 x b	d1 x d2 x b
3 x 7 x 5mm	20 x 32 x 14mm	42 x 63 x 18mm
4 x 8 x 5mm	22 x 36 x 14mm	45 x 70 x 18mm
5 x 10 x 6mm	24 x 40 x 16mm	48 x 70 x 18mm
6 x 12 x 8mm	25 x 40 x 16mm	50 x 80 x 18mm
7 x 12 x 8mm	26 x 40 x 16mm	55 x 80 x 18mm
8 x 16 x 8mm	28 x 45 x 16mm	56 x 80 x 18mm
9 x 18 x 10mm	30 x 45 x 16mm	58 x 90 x 20mm
10 x 20 x 10mm	32 x 50 x 16mm	60 x 90 x 20mm
11 x 20 x 10mm	34 x 50 x 16mm	63 x 90 x 20mm
12 x 22 x 12mm	35 x 56 x 16mm	65 x 100 x 20mm
14 x 25 x 12mm	36 x 56 x 16mm	70 x 100 x 20mm
15 x 25 x 12mm	38 x 56 x 16mm	75 x 110 x 22mm

WASHERS

DISC SPRING - FOR CRITICAL APPLICATIONS Type A (HEAVY) - Steel Phosphated



ISO	:	-
DIN	:	2093 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

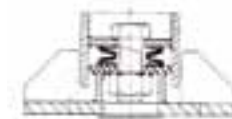


De (nom.) h12	8	10	12.5	14	16	18	20	22.5	25	28	31.5
D1 (H12)	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	14.2	16.3
t	0.4	0.5	0.7	0.8	0.9	1	1.1	1.25	1.5	1.5	1.75
Lo	0.6	0.75	1	1.1	1.25	1.4	1.55	1.75	2.05	2.15	2.45
F	210	329	673	813	1000	1250	1530	1950	2910	2850	3900

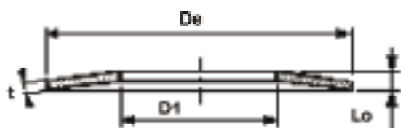
De (nom.) h12	35.5	40	45	50	56	63	71	80	90	100	112
D1 (H12)	18.3	20.4	22.4	25.4	28.5	31	36	41	46	51	57
t	2	2.25	2.5	3	3	3.5	4	5	5	6	6
Lo	2.8	3.15	3.5	4.1	4.3	4.9	5.6	6.7	7	8.2	8.5
F	5190	6450	7720	12000	11400	15000	20500	33700	31400	48000	43800

SIZE AVAILABLE		
De x Di x t	De x Di x t	De x Di x t
8x4.2x0.4mm	25x12.2x1.5mm	56x28.5x3mm
10x5.2x0.5mm	28x14.2x1.5mm	63x31x3.5mm
12.5x6.2x0.7mm	31.5x16.3x1.75mm	71x36x4mm
14x7.2x0.8mm	35.5x18.3x2mm	80x41x5mm
16x8.2x0.9mm	40x20.4x2.25mm	90x46x5mm
18x9.2x1mm	45x22.4x2.5mm	100x51x6mm
20x10.2x1.1mm	50x25.4x3mm	112x57x6mm
22.5x11.2x1.25mm		

EXAMPLE of APPLICATION SHOCK ABSORPTION



DISC SPRING - FOR CRITICAL APPLICATIONS Type B (MEDIUM) - Steel Phosphated



ISO	:	-
DIN	:	2093 B
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



De (nom.) h12	8	10	12.5	14	16	18	20	22.5	25	28	31.5
D1 (H12)	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	14.2	16.3
t	0.3	0.4	1.5	0.5	0.6	0.45	0.5	0.6	0.7	0.8	0.8
Lo	0.55	0.7	0.85	0.9	1.05	1.05	1.15	1.4	1.6	1.8	1.85
F	119	213	291	279	412	214	254	425	601	801	687

De (nom.) h12	35.5	40	45	50	56	63	71	80	90	100	112
D1 (H12)	18.3	20.4	22.4	25.4	28.5	31	36	41	46	51	57
t	1.25	1.5	1.75	2	2	2.5	2.5	3	3.5	3.5	4
Lo	2.25	2.65	3.05	3.4	3.6	4.25	4.5	5.3	6	6.3	6.9
F	1700	2620	3660	4760	4440	7180	6730	10500	14200	13100	17800

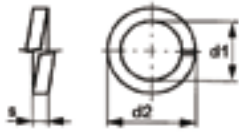
SIZE AVAILABLE		
De x Di x t	De x Di x t	De x Di x t
8x4.2x0.3mm	25x12.2x0.9mm	56x28.5x3mm
10x5.2x0.4mm	28x14.2x1mm	63x31x2.5mm
12.5x6.2x0.5mm	31.5x16.3x1.25mm	71x36x2.5mm
14x7.2x0.5mm	35.5x18.3x1.25mm	80x41x3mm
16x8.2x0.6mm	40x20.4x1.5mm	90x46x3.5mm
18x9.2x0.7mm	45x22.4x1.75mm	100x51x3.5mm
20x10.2x0.8mm	50x25.4x2mm	112x57x4mm
22.5x11.2x0.8mm		

EXAMPLE of APPLICATION BALL VALVE



WASHERS

SPRING LOCK WASHERS with SQUARE ENDS Steel Zinc Plated, Balck & HOT DIP Galvanized, YELLOW



ISO : -
DIN : 127 B
NEN : 1197 B
ANSI : -
BS : -
NF : E25-515



For nom. Size	M2	M2.3	M2.6	M3	M3.5	M4	M5	M6	-	M7	M8	-	M10
d1 (min.)	2.1	2.4	2.7	3.1	3.6	4.1	5.1	6.1	6.4	7.1	8.1	9.7	10.2
d2 (max.)	4.4	4.9	5.2	6.2	6.7	7.6	9.2	11.8	12.1	12.8	14.8	17.6	18.1
s	0.5	0.6	0.6	0.8	0.8	0.9	1.2	1.6	1.6	1.6	2	2.2	2.2

For nom. Size	M11	M12	-	M14	M16	M18	M20	M22	M24	-	M27	M30	M33
d1 (min.)	11.2	12.2	13	14.2	16.2	18.2	20.2	22.5	24.5	26.5	27.5	30.5	33.5
d2 (max.)	18.2	21.1	21.8	24.1	27.4	29.4	33.6	35.9	40	42.5	43	48.2	55.2
s	2.2	2.5	2.5	3	3.5	3.5	4	4	5	5	5	6	6

For nom. Size	M36	M39	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76
d1 (min.)	36.5	39.5	42.5	45.5	49	53	57	61	65	69	73	77
d2 (max.)	58.2	61.2	68.2	71.2	75	83	87	91	95	99	103	107
s	6	6	7	7	7	8	8	8	8	8	8	8

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M2	M11	M36
M2.3	M12	M39
M2.6	1/2	M42
M3	M14	M45
M3.5	M16	M48
M4	M18	M52
M5	M20	M56
M6	M22	M60
1/4	M24	M64
M7	1 IN.	M68
M8	M27	M72
3/8 Precise	M30	M76
M10	M33	

SPRING LOCK WASHERS with SQUARE ENDS Steel Zinc PL. YELLOW Passivated & Steel HOT DIP Galvanized, Black & zink plated

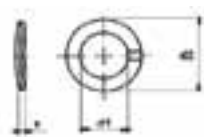
For nom. Size	M3	M4	M5	M6	M7	M8	M10	M12
d1 (min.)	3.1	4.1	5.1	6.1	7.1	8.1	10.2	12.2
d2 (max.)	6.2	7.6	9.2	11.8	12.8	14.8	18.1	21.1
s	0.8	0.9	1.2	1.6	1.6	2	2.2	2.5

For nom. Size	M14	M16	M18	M20	M22	M24	M27	M30
d1 (min.)	14.2	16.2	18.2	20.2	22.5	24.5	27.5	30.5
d2 (max.)	24.1	27.4	29.4	33.6	35.9	40	43	48.2
s	3	3.5	3.5	4	4	5	5	6

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M8	M18
M4	M10	M20
M5	M12	M22
	M14	M24
M6		
M7	M16	M27
		M30

WASHERS

CURVED SPRING LOCK WASHERS - STEEL ZINC PLATED



ISO : -
DIN : 128 A
NEN : 1570
ANSI : -
BS : -
NF : -



For nom. Size	M2	M2.3 3	M2.5	-	M3	M3.5	M4	M5	M6	-	M7
d1 (min.)	2.1	2.4	2.7	3.1	3.1	3.6	4.1	5.1	6.1	6.5	7.1
d2 (max.)	4.4	4.9	5.2	6.2	6.2	6.7	7.6	9.2	11.8	12.6	12.8
s	0.5	0.6	0.6	0.6	0.7	0.7	0.8	1	1.3	1.3	1.3

For nom. Size	M8	-	M10	-	M12	-	M14	M16	M18	M20	M22
d1 (min.)	8.1	9.7	10.2	11.3	12.2	13	14.2	16.2	18.2	20.2	22.5
d2 (max.)	14.8	17.6	18.1	19.3	21.1	22.8	24.1	27.4	29.4	33.6	35.9
s	1.6	1.8	1.8	2.1	2.1	2.4	2.4	2.8	2.8	3.2	3.2

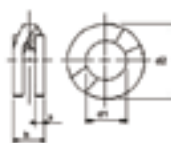
For nom. Size	M24	-	M27	M30	M33 3	M36	M39 3	M42	M45 3	M48	M52 3
d1 (min.)	24.5	26.5	27.5	30.5	34	36.5	39.5	42.5	46.7	49	54
d2 (max.)	40	42.5	43	48.2	54.2	58.2	59.2	68.2	70.5	75	81.6
s	4	4	4	6	6	6	6	7	7	7	8

For nom. Size	M2	M2.3	M2.6	M3	M3.5	M4	M5	M6	-	M7	M8	-	M10
d1 (min.)	2.1	2.4	2.7	3.1	3.6	4.1	5.1	6.1	6.4	7.1	8.1	9.7	10.2
d2 (max.)	4.4	4.9	5.2	6.2	6.7	7.6	9.2	11.8	12.1	12.8	14.8	17.6	18.1
s	0.5	0.6	0.6	0.8	0.8	0.9	1.2	1.6	1.6	1.6	2	2.2	2.2

SIZE AVAILABLE

For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M2	M4	3/8 Precise	M16	M27	M39
M2.3	M5	M10	M18		M42
M2.5	M6	M11	M20	M30	M45
M2.6	1/4	M12	M22	M33	M48
M3	M7	1/2	M24	M36	M52
M3.5	M8	M14	1 IN.		

DOUBLE COIL SPRING LOCK WASHERS - STEEL



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : -



For nom. Size	M5	M6	M8	M10	M12	M16	M20	M22	M26
d1	5.1	6.1	8.2	10.2	12.2	16.2	20.2	22.5	26.5
d2	8.7	11.1	14.2	17.2	20.2	26.2	32.2	34.5	40.5
s	1.2	1.6	2	2.2	2.5	3.5	4	4	5
h	4.2	5.6	7	7.7	8.8	12.3	14	14	17.5

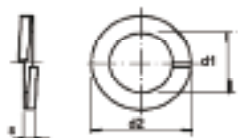
SIZE AVAILABLE

For nom. Size	For nom. Size	For nom. Size
M5	M10	M20
M6	M12	M22
M8	M16	M26

3 This size is not DIN standardized

WASHERS

SPRING LOCK WASHERS for SCREWS with CYLINDRICAL HEADS Steel and Steel Zinc Plated



ISO :
DIN : 7980
NEN : -
ANSI : -
BS : -
NF :

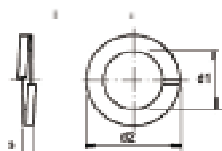


For nom.	M3	M4	M5	M6	-	M8	M10	M12	-
Size	-	5/32	3/16	-	1/4	5/16	3/4	-	1/2
d1 (max.)	3.1	4.1	5.1	6.1	6.50	8.1	10.2	12.2	13
d2 (max.)	5.6	7	9	9.9	11.1	12.7	16	18	20.2
s	1	1.2	1.6	1.6	2	2	2.5	2.5	3

For nom.	M14	M16	M20	M22	M24	-	M27	M30
Size	9/16	5/8	3/4	7/8	-	1	-	1 1/8
d1 (max.)	14.2	16.2	20.2	22.5	24.5	26.5	27.5	30.5
d2 (max.)	21.1	24.4	30.6	32.9	35.9	37.4	38.9	44.1
s	3	3.5	4.5	4.5	5	5	5	6

SIZE AVAILABLE				
For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M3	1/4	M12	M16	1 IN.
M4			M20	
M5	M8	1/2	M22	M27
M6	M10	M14	M24	M30

CONTACT SPRING WASHERS for SWITCH GEAR PLANTS STEEL ZINC PLATED



ISO :
DIN : 43699 (W)
NEN : -
ANSI : -
BS : -
NF :

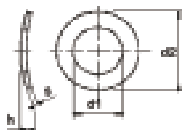


For nom.	M6	M8	M10	M12	M16	M20
Size						
d1 (max.)	6.1	8.2	10.2	12.2	16.2	20.2
d2 (max.)	12.1	15.2	18.2	22.2	28.2	34.2
s	2	2.2	2.5	3.5	4	5

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M6	M10	M16
M8	M12	M20

WASHERS

WAVE WASHERS (CURVE SHAPE) - STEEL and STEEL ZINC PLATED YELLOW PASSIVATED



ISO :
DIN : 7980
NEN : -
ANSI : -
BS : -
NF : -

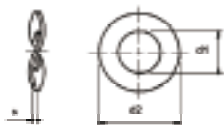


For nom.	M2	M2.3	M2.5 2	M2.6	M3	M3.5
Size	5/64	-	-	-	1/8	-
d1	2.2	2.5	2.6	2.8	3.2	3.7
d2	4.5	5	5	5.5	6	7
s	0.3	0.3	0.3	0.3	0.4	0.4
h (max)	1	1	1	1.1	1.3	1.4

For nom.	M4	M5	M6	M7	M8	M10
Size	5/32	3/16	-	1/4	5/16	3/8
d1	4.3	5.3	6.4	7.4	8.4	10.5
d2	8	10	11	12	15	18
s	0.5	0.5	0.5	0.5	0.5	0.8
h (max)	1.6	1.8	2.2	2.4	3.4	4

SIZE AVAILABLE				
For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M2	M62.6	M4	M6	M8
M2.3	M3	M5	M7	M10
M2.5	M3.5			

WAVE (SPRING TYPE) WASHERS - STEEL and STEEL ZINC PLATED YELLOW PASSIVATED



ISO :
DIN : 137 (B)
NEN : 2457
ANSI : -
BS : -
NF : E27-620



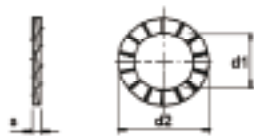
For nom.	M3	M4	M5	M6	M7	M8	M10
Size	1/8	5/32	3/16	-	1/4	5/16	3/8
d1 (max.)	3.2	4.3	5.3	6.4	7.4	8.4	10.5
d2 (max.)	8	9	11	12	14	15	21
s	0.5	0.5	0.5	0.5	0.8	0.8	1.0

For nom.	M12	M14	M16	M20	M22	M24
Size	1/2	9/16	5/8	3/4	7/8	-
d1 (max.)	13	15	17	21	23	25
d2 (max.)	24	28	30	36	40	44
s	1.2	1.6	1.6	1.6	1.8	1.8

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M7	M16
M4	M8	M20
M5	M12	M22
M6	M14	M24

WASHERS

NORD-LOCK LOCK WASHERS - STEEL ZINC PLATED YELLOW PASSIVATED



ISO	:	
DIN	:	7980
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



For nom. Size	M6	M8	M10	M12	M14	M16	M18	M20
d1	6.5	8.2	10.3	13	14.5	17	19.5	21
d2	10.8	13.5	16.6	19.5	23	25.4	29	30.7
s	1.8	2.5	2.5	2.5	3.4	3.4	3.4	3.4
MA	12	30	59	103	160	250	350	490

For nom. Size	M22	M24	M27	M30	M33	M36	M39	M42
d1	22.9	25.1	28.5	30.5	33.5	36.5	39.5	42.5
d2	34.5	39	42	47	48.5	58.5	58.5	58.5
s	3.4	3.4	4.6	4.6	4.6	4.6	4.6	4.6
MA	660	850	1220	1660	2200	2900	3800	3900

SIZE AVAILABLE				
For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M6	M12	M18	M24	M36
M8	M14	M20	M27	M39
M10	M16	M22	M30	
			M33	M42

NORD-LOCK LOCKING WASHERS; ensures against loosening of transverse-loaded, movable or vibrating bolt connections, applicable with hexagon head bolts, hexagon nuts, etc. property class 10.9.

- The NORD-LOCK system consist of two identical washers which have external protruding ribs on one side, and inclined facets on the other, see 1

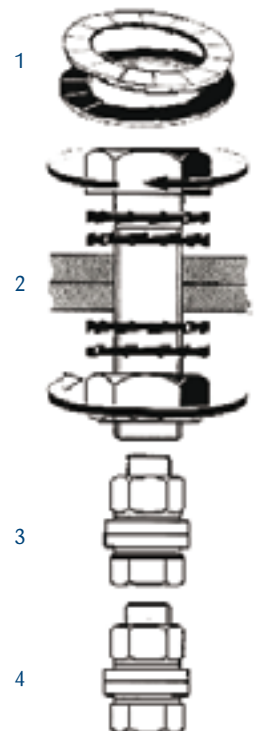
- The inclined angle of the facets is large than the pitch angle of the tread of the bolt or nut. The NORD-LOCK washers are assembled in pairs, with the inclined facets facing each other, see 2.

- During tightening the protruding ribs of one washer are pressed into the contract surface of the nut or bolt, and the protruding ribs of the other washer are pressed into the work piece. Simultaneously slot the inclined facets perfectly into each other, see 3.

- Should the bolt and nut loosen, then the NORD-LOCK washer will turn with it, causing the two washers to press against each other. The inclined facets rotate the washer (also the bolt/nut) higher than the thread permits, resulting in a self locking action, see 4

- Loosening of a nut or bolt , due to vibration etc. will result in a strengthened locking action. to ensure a good surface contact of the protruding ribs , 20% more torque than normal is required. By dis - assembly is a normal torque sufficient to loosen the connection, while the remaining tension is increased by only 10%.

- ATTENTION; for assembly without a nut two washers are necessary, for a bolt/nut connection four washer.

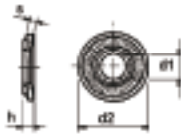


MA = Tightening torques in NM for a class 8.8 bolt

WARNING ; Electro - galvanizing of these products may cause hydrogen embrittlement.

WASHERS

CONTACT-LOCK WASHER - Type Medium Steel Zinc Plated YELLOW PASSIVATED



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	E25-511 (CS)



For nom.	M4	M5	M6	M8	M10	M12	M16
Size	5/32	3/16	-	5/16	3/8	-	5/8
d1 (H14)	4.1	5.1	6.1	8.2	10.2	12.4	16.4
d2 (js 15)	10	12	14	18	22	27	32
s	0.9	1.1	1.3	1.4	1.6	1.8	2.8
h (max)	1.4	1.8	2.1	2.35	2.75	3.1	4.1

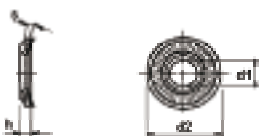
SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M4	M8	M12
M5	M10	M16
M6		

- TYPE MEDIUM - Contact Lock washer are suitable for use simultaneously as lock washer and plain washer with oversize or elongared holes. The advantage of contact lock washers are no damage to surface, exceptional locking action and high elasticity to compensate play or setting and excellent contact in electrical appliances avoiding overheating.



- SPRING STEEL

CONTACT-LOCK WASHER - Type P - Steel Zinc Plated YELLOW PASSIVATED



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



For nom.	M4	M5	M6	M8	M10	M12
Size	-	-	-	5/16	3/8	-
d1 (H14)	4.1	5.1	6.1	8.2	10.2	12.4
d2 (js 15)	8	10	12	14	20	24
s	0.8	1	1.2	1.4	1.6	1.6
h (max)	1.15	1.5	1.8	2.4	2.6	2.6

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M4	M6	M10
M5	M8	M12

- TYPE P - Contact Lock washer are suitable for use simultaneously as lock washer and plain washer with oversize or elongared holes. The advantage of contact lock washers are no damage to surface, Exceptional locking action and high elasticity to compensate play or setting and excellent contact in electrical appliances avoiding overheating.

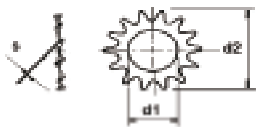
Contact -lock washer TYPE P are provided with six sharp point (height 0.3 mm), they penetratethe possible coat of laquer and will provide an excellent earthing.

- SPRING STEEL

WARNING ; Electro gaivanizing of these products may cause hydrogen embrittlement

WASHERS

TOOTHED LOCK WASHER EXTERNAL TEETH - STEEL, ZINC PLATED



ISO	:	
DIN	:	6797 A
NEN	:	- 2450
ANSI	:	-
BS	:	-
NF	:	E25-511 (CS)



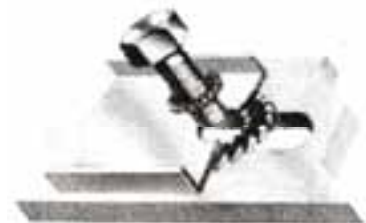
For nom. Size	M3	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
d1	4.1	4.3	5.3	6.4	8.4	10.5	13	15	17	21	25
d2	10	8	10	11	15	18	20.5	24	26	33	38
s	0.9	0.5	0.6	0.7	0.8	0.9	1	1	1.2	1.4	1.5

SIZE AVAILABLE			
For nom. Size	For nom. Size	For nom. Size	For nom. Size
M3	M6	M12	M20
M4	M8	M14	M24
M5	M10	M16	

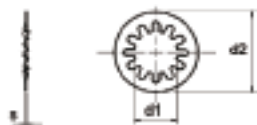
- External teeth for bolts and nuts with normal widths across flats.
- Spring steel, hardness 350-425 HV10.

Toothed lock washers are mainly used to make electrical contact with parts being surface coated (lacquer, corrosion resistant layer, etc.) by penetration of the teeth through the isolating layer.

When they are applied with low-tensile fasteners as a locking element, the locking performance has to be tested for every application.



TOOTHED LOCK WASHERS INTERNAL TEETH - STEEL, ZINC PLATED



ISO	:	-
DIN	:	6797 J
NEN	:	2451
ANSI	:	-
BS	:	-
NF	:	-



For nom. Size	M3	M4	M5	M6	M8	M10	M12	M16	-	M20
Size	-	-	-	-	-	-	-	-	3/4 precise	-
d1	3.2	4.3	5.3	6.4	8.4	10.5	13	17	20	21
d2	6	8	10	11	15	18	20.5	26	32	33
s	0.4	0.5	0.6	0.7	0.8	0.9	1	1.2	1.4	1.4

SIZE AVAILABLE			
For nom. Size	For nom. Size	For nom. Size	For nom. Size
M3	M6	M12	M20
M4	M8	3/4 precise	
M5	M10	M16	

- Internal teeth for bolts and nuts with widths across flats smaller than normal and when due to appearance the teeth are wanted on the internal side
- Spring steel, hardness 350-425 HV10.

Toothed lock washers are mainly used to make electrical contact with parts being surface coated (lacquer, corrosion resistant layer, etc.) by penetration of the teeth through the isolating layer.

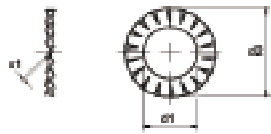
When they are applied with low-tensile fasteners as a locking element, the locking performance has to be tested for every application.



WARNING ; Electro galvanizing of these products may cause hydrogen embrittlement

WASHERS

SERRATED LOCK WASHER EXTERNAL TEETH - STEEL STEEL ZINC PLATED, YELLOW PASSIVATED



ISO : -
DIN : 6798 A
NEN : 2453
ANSI : -
BS : -
NF : E27-624

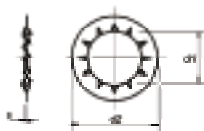


For nom.	M2	M3	M3.5	M4	M5 4	M5	M6	M7	M8 4	M8
Size	5/64	-	-	5/32	-	-	-	9/32	5/16	5/16
d1	2.2(2.05)	3.2	3.7	4.3	5.1	5.3	6.4	7.4	8.2	8.4
d2	4.5	6	7	8	9	10	11	12.5	14	15
S1	0.3	0.4	0.5	0.5	0.5	0.6	0.7	0.8	0.8	0.8

For nom.	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Size	-	-	-	5/8	-	-	7/8	-	1 1/16	1 3/16
d1	10.5	13	15(14.5)	17(16.5) 3	19	21	23	25	28	31
d2	18	20.5	24	26	30	33	36	38	44	48
S1	0.9	1	1	1.2	1.4	1.4	1.5	1.5	1.6	1.6

SIZE AVAILABLE				
For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M2	M5	M8	M14	M22
M3	M5	M8	M16	M24
M3.5	M6	M10	M18	M27
M4	M7	M12	M20	M30

SERRATED LOCK WASHER INTERNAL TEETH - STEEL and STEEL ZINC PLATED, YELLOW PASSIVATED



ISO : -
DIN : 6798 J
NEN : 2454
ANSI : -
BS : -
NF : E27-625



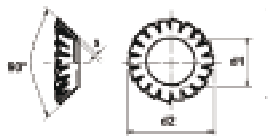
For nom.	M2	M2.5	-	M3	M3.5	M4	M5	M6	M7	M8 4	M8
Size	5/64	3/32	7/54	-	-	5/32	-	-	9/32	5/16	5/16
d1	2.2(2.05)	2.7(2.55)	2.9	3.2	3.7	4.3	5.3	6.4	7.4	8.2	8.4
d2	4.5	5.5	5.7	6	7	8	10	11	12.5	14	15
S	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.8

For nom.	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33
Size	-	-	-	5/8	-	-	7/8	-	1 1/16	1 3/16	1 1/4
d1	10.5	12.5	15	17	19	21	23	25	28	31	33.3
d2	18	20.5	14	26	30	33	36	38	44	48	49.9
S	0.9	1	1.1	1.2	1.4	1.4	1.5	1.5	1.6	1.6	1.8

SIZE AVAILABLE				
For nom. Size	For nom. Size	For nom. Size	For nom. Size	For nom. Size
M2	M4	M8 (8.2mm)	M18	1 in
M2.5	M5 (5.1mm)	M10	M20	M27
7/64	M5 (5.3mm)	M12	M22	M30
M3	M6	M14	M24	M33
M3.5	M7	M16		

WASHERS

COUNTERSUNK SERRATED LOCK WASHERS EXTERNAL TEETH STEEL ZINC PLATED



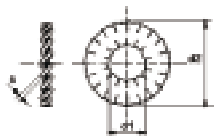
ISO : -
DIN : 6798 V
NEN : -
ANSI : -
BS : -
NF : E27-627



For nom.	M3	M4	M5	M6	M8	M10	M12	M14	M16
Size	7/64	5/32	3/16	-	5/16	3/8	-	9/16	5/8
d1	3.2	4.3	5.3	6.4	8.4	10.5	13 (12.5)	15 (14.5)	17 (16.5)
d2	6	8	9.8	11.8	15.3	19	23 (20.5)	26.2(24)	30.2 (26)
s	0.2	0.25	0.3	0.4	0.4	0.5	0.5	0.6	0.6

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M6	M12
M4	M8	M14
M5	M10	M16

DOUBLE SERRATED LOCK WASHERS - STEEL ZINC PLATED



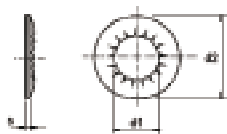
ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : E27-626



For nom.	M3	M4	M5	M6	M8	M10	M12	M14	M16
Size	1/8	5/32	3/16	1/4	5/16	3/8	-	9/16	5/8
d1	3.2	4.2	5.2	6.2	8.2	10.3	12.3	14.2	16.5
d2	12.4	15.6	17.9	18.2	22.3	26.1	30.3	33.7	36.1
S	0.5	0.8	0.8	0.8	1	1.1	1.2	1.4	1.4

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M6	M12
M4	M8	M14
M5	M10	M16

HEAVY DOMED INTERNAL SERRATED LOCK WASHER - STEEL



ISO : -
DIN : -
NEN : -
ANSI : -
BS : -
NF : E27-626

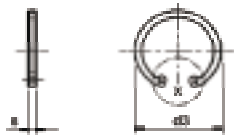


For nom.	M3	M4	M5	M6	M8	M10	M12	M16	M20
Size	1/8	5/32	3/16	1/4	5/16	3/8	-	5/8	3/4
d1	3.2	4.3	5.1	6.1	8.15	10.2	12.2	16.5	20.5
d2	8.7	11.2	16.2	18.3	26.3	26.3	32.4	32.4	39.4
S	0.5	0.6	1	1	1.2	1.4	1.4	1.4	1.8

SIZE AVAILABLE		
For nom. Size	For nom. Size	For nom. Size
M3	M6	M12
M4	M8	M16
M5	M10	M20

WASHERS

RETAINING RINGS for BORES - NORMAL TYPE - STEEL



ISO :
DIN : 472
NEN : -
ANSI : -
BS : -
NF : E22-165



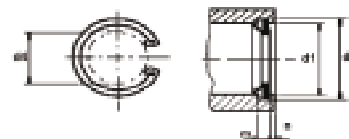
Nom. Size bore d1	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ring	s	0.8	0.8	1	1	1	1	1	1	1	1	1	1	1
	d3	8.7	9.8	10.8	11.8	13	14.1	15.1	16.2	17.3	18.3	19.5	20.5	21.5
	d4	3	3.7	3.3	4.1	4.9	5.4	6.2	7.2	8	8.8	9.4	10.4	11.2
groove	d2	8.4	9.4	10.4	11.4	12.5	13.6	14.6	15.7	16.8	17.8	19	20	21
	m (H13)	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	n (min.)	0.6	0.6	0.6	0.6	0.8	0.9	0.9	1.1	1.2	1.2	1.5	1.5	1.5
nr. Of pillar acc. To DIN 5256		8	8	8	8	8	8	8	8	8	8	19	19	19

Nom. Size bore d1	22	23	24	25	26	27	28	29	30	31	32	33	34	35
ring	s	1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.5	1.5
	d3	23.5	24.6	25.9	26.9	27.9	29.1	30.1	31.1	32.1	33.4	34.4	35.5	36.5
	d4	13.2	15.4	14.8	15.5	16.1	18.2	17.9	19.6	19.9	20	20.6	22.2	22.6
groove	d2	23	24.1	25.2	26.2	27.2	28.4	29.4	30.4	31.4	32.7	33.7	34.7	35.7
	m (H13)	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	1.6
	n (min.)	1.5	1.7	1.8	1.8	1.8	2.1	2.1	2.1	2.1	2.6	2.6	2.6	3
nr. Of pillar acc. To DIN 5256	19	19	19	19	19	19	19	19	19	19	19	19	19	19

Nom. Size bore d1	36	37	38	39	40	41	42	43	44	45	46	47	48	50
ring	s	1.5	1.5	1.5	1.5	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	2
	d3	38.8	39.8	40.8	42	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5	51.5
	d4	24.6	25.4	26.4	28.6	27.8	29	29.6	-	32	32	34.6	33.5	34.5
groove	d2	38	39	40	41	42.5	43.5	44.5	45.5	46.5	47.5	48.5	49.5	50.5
	m (H13)	1.6	1.6	1.6	1.6	1.85	1.85	1.85	1.85	1.85	1.85	1.85	1.85	2.15
	n (min.)	3	3	3	3	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	4.5
nr. Of pillar acc. To DIN 5256	19	19	19	40	40	40	40	40	40	40	40	40	40	40

SIZE AVAILABLE				
d1	d1	d1	d1	d1
8mm	16mm	25mm	34mm	43mm
9mm	17mm	26mm	35mm	44mm
	18mm	27mm	36mm	45mm
10mm	19mm	28mm	37mm	46mm
11mm	20mm	29mm	38mm	47mm
12mm	21mm	30mm	39mm	48mm
13mm	22mm	31mm	40mm	49mm
14mm	23mm	32mm	41mm	
15mm	24mm	33mm	42mm	50mm

TECHNICAL DATA

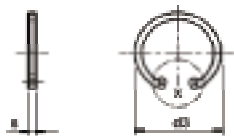


d1 170mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement.

WASHERS

RETAINING RINGS for BORES - NORMAL TYPE - STEEL



ISO :
DIN : 472
NEN : -
ANSI : -
BS : -
NF : E22-165



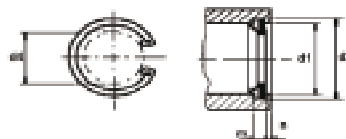
Nom. Size bore d1	52	53	54	55	56	57	58	60	62	63	64	65	67	68
ring	s	2	2	2	2	2	2	2	2	2	2.5	2.5	2.5	2.5
	d3	56.2	57.2	58.2	59.2	60.2	61.2	62.2	64.2	66.2	67.2	68.2	69.2	71.5
	d4	37.9	40	41	40.7	41.7	44	43.5	44.7	47.7	47.7	48.7	49	52
groove	d2	55	56	57	58	59	60	61	63	66	66	67	68	70
	m (H13)	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.65	2.65
	n (min.)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
nr. Of pillar acc. To DIN 5256	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Nom. Size bore d1	70	72	75	77	78	80	82	85	87	88	90	92	95	97
ring	s	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3
	d3	74.5	76.5	79.5	81.5	82.5	85.5	87.5	90.5	92.5	93.5	95.5	97.5	100.5
	d4	53.6	55.6	58.6	62	60.1	62.1	64.1	66.9	69.8	69.9	71.9	73.3	76.5
groove	d2	73	75	78	80	81	83.5	85.5	88.5	90.5	91.5	93.5	95.5	98.5
	m (H13)	2.65	2.65	2.65	2.65	2.65	2.65	2.65	3.15	3.15	3.15	3.15	3.15	3.15
	n (min.)	4.5	4.5	4.5	4.5	4.5	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
nr. Of pillar acc. To DIN 5256	40	40	40	40	40	40	40	85	85	85	85	85	85	85

Nom. Size bore d1	98	100	102	105	108	110	112	115	117	120	125	130	135	140
ring	s	3	3	4	4	4	4	4	4	4	4	4	4	4
	d3	103.5	105.5	108	112	115	117	119	122	124	127	132	137	142
	d4	79	80.6	82	85	88	88.2	90	93	97	96.9	101.9	106.9	111.5
groove	d2	101.5	103.5	106	109	112	114	116	119	121	124	129	134	139
	m (H13)	3.15	3.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
	n (min.)	5.3	5.3	6	6	6	6	6	6	6	6	6	6	6
nr. Of pillar acc. To DIN 5256	85	85	85	85	85	85	85	85	85	85	125	125	125	125

SIZE AVAILABLE				
d1	d1	d1	d1	d1
52mm	63mm	78mm	97mm	115mm
53mm	64mm	80mm	98mm	117mm
54mm	65mm	82mm		120mm
55mm	67mm	85mm	100mm	125mm
		87mm	102mm	
56mm	68mm	88mm	105mm	130mm
57mm	70mm		108mm	135mm
58mm	72mm	90mm		140mm
60mm	75mm	92mm	110mm	
62mm	77mm	95mm	112mm	

TECHNICAL DATA

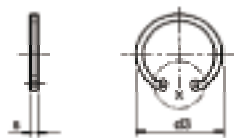


DETAIL X		
d1 170mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement

WASHERS

RETAINING RINGS for BORES - NORMAL TYPE - STEEL



ISO :
DIN : 472
NEN : -
ANSI : -
BS : -
NF : E22-165

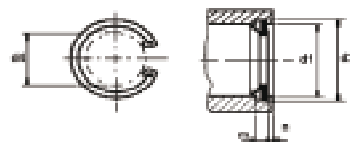


Nom. Size bore d1	145	150	155	158	160	170	172	175	180	185	188	190	192	195
ring	s	4	4	4	4	4	4	4	4	4	4	4	4	4
	d3	152	158	164	167	169	179.5	181.5	184.5	189.5	194.5	197.5	199.5	204.5
	d4	121	124.8	129.8	134	132.7	141.6	-	146.6	150.2	155.2	-	160.2	162.2
groove	d2	149	155	160	163	165	175	177	180	185	190	193	195	197
	m (H13)	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
	n (min.)	6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
nr. Of pillar acc. To DIN 5256		125	125	125	25	125	125	125	125	125	125	125	125	125

Nom. Size bore d1	200	202	210	215	220	230	240	250	260	275	280	290	300
ring	s	4	5	5	5	5	5	5	5	5	5	5	5
	d3	209.5	214	222	227	232	242	252	262	275	290	295	305
	d4	170.2	-	180.2	-	190.2	200.2	210.2	220.2	226	241	246	256
groove	d2	205	208	216	221	226	236	246	256	268	283	288	298
	m (H13)	4.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
	n (min.)	7.5	9	9	9	9	9	9	12	12	12	12	12
nr. Of pillar acc. To DIN 5256		125	125	125	125	125	125	125	125	125	125	125	125

SIZE AVAILABLE				
d1	d1	d1	d1	d1
145mm	170mm	188mm	210mm	260mm
150mm		190mm	215mm	275mm
	172mm	192mm		
155mm	175mm	195mm	220mm	280mm
158mm			230mm	290mm
	180mm	200mm	240mm	
160mm	185mm	202mm	250mm	300mm

TECHNICAL DATA

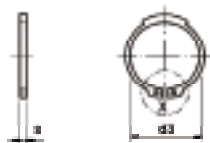


DETAIL X		
d1 300mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement.

WASHERS

RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



ISO :
DIN : 471
NEN : -
ANSI : -
BS : -
NF : E22-163



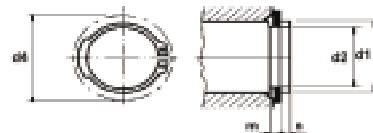
Nom. Size shaft d1	4	5	6	7	8	9	10	11	12	13	14	15	16
ring	s	0.4	0.6	0.7	0.8	0.8	1	1	1	1	1	1	1
	d3	3.7	4.7	5.6	6.5	7.4	8.4	9.3	10.2	11	11.9	12.9	13.8
	d4	8.6	10.3	11.7	13.5	14.7	16	17	18	19	20.2	21.4	22.6
groove	d2	3.8	4.8	5.7	6.7	7.6	8.6	9.6	10.5	11.5	12.4	13.4	14.3
	m (H13)	0.5	0.7	0.8	0.9	0.9	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	n (min.)	0.3	0.3	0.5	0.5	0.6	0.6	0.6	0.8	0.8	0.9	0.9	1.1
nr. Of pillar acc. To DIN 5254	3	3	3	3	3	3	10	10	10	10	10	10	10

Nom. Size shaft d1	17	18	19	20	21	22	23	24	25	26	27	28	29
ring	s	1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.5	1.5
	d3	15.7	16.5	17.5	18.5	19.5	20.5	21.5	22.2	23.2	24.2	24.9	25.9
	d4	25	26.2	27.2	28.4	29.6	30.8	31	33.2	34.2	35.5	35.4	37.9
groove	d2	16.2	17	18	19	20	21	22	22.9	23.9	24.6	25.9	26.6
	m (H13)	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.6	1.6
	n (min.)	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.7	1.7	1.7	2.1	2.1
nr. Of pillar acc. To DIN 5254	10	10	19	19	19	19	19	19	19	19	19	19	19

Nom. Size shaft d1	30	31	32	33	34	35	36	37	38	39	40	42	44
ring	s	1.5	1.5	1.5	1.5	1.5	1.75	1.75	1.75	1.75	1.75	1.75	1.75
	d3	27.9	28.6	29.6	30.5	31.5	32.2	33.2	34.2	35.2	36	36.5	38.5
	d4	40.5	40.3	43	43.4	45.4	46.8	47.8	48	50.2	50.2	52.6	55.7
groove	d2	28.6	29.3	30.3	31.3	32.3	33	34	35	36	37	37.5	39.5
	m (H13)	1.6	1.6	1.6	1.6	1.6	1.6	1.85	1.85	1.85	1.85	1.85	1.85
	n (min.)	2.1	2.6	2.6	2.6	2.6	3	3	3	3	3	3.8	3.8
nr. Of pillar acc. To DIN 5254	19	19	19	19	19	19	19	19	19	40	40	40	40

SIZE AVAILABLE			
d1	d1	d1	d1
4mm	14mm	24mm	35mm
5mm	15mm	25mm	36mm
6mm	16mm	27mm	37mm
7mm	17mm	28mm	38mm
	18mm	29mm	39mm
8mm	19mm		
9mm		30mm	40mm
10mm	20mm	31mm	41mm
11mm	21mm	32mm	42mm
12mm	22mm	33mm	44mm
13mm	23mm	34mm	

TECHNICAL DATA

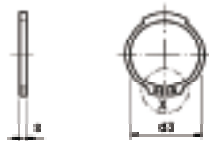


DETAIL X		
d1 300mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement.

WASHERS

RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



ISO :
DIN : 471
NEN : -
ANSI : -
BS : -
NF : E22-163



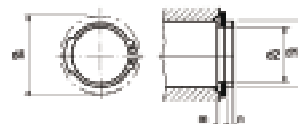
Nom. Size shaft d1		45	47	48	50	52	54	55	56	57	58	60	62	63
ring	s	1.75	1.75	1.75	2	2	2	2	2	2	2	2	2	2
	d3	41.5	43.5	44.5	45.8	47.8	49.8	50.8	51.8	52.8	53.8	55.8	57.8	58.8
	d4	59.1	58.5	62.5	64.5	66.7	67	70.2	71.6	70	73.6	75.6	77.8	79
groove	d2	42.5	44.5	45.5	47	49	51	52	53	54	55	57	59	60
	m (H13)	1.85	1.85	1.85	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
	n (min.)	3.8	3.8	3.8	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
nr. Of pillar acc. To DIN 5254		40	40	40	40	40	40	40	40	40	40	40	40	40

Nom. Size shaft d1		65	67	68	70	72	75	77	78	80	82	85	87	88
ring	s	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3
	d3	60.8	62.5	63.5	65.5	67.5	70.5	72.5	73.5	74.5	76.5	79.5	81.5	82.5
	d4	81.4	82	84.8	87	89.2	92.7	94	96.1	98.1	100.3	103.3	104	106.5
groove	d2	62	64	65	67	69	72	74	75	76.5	78.5	81.5	83.5	84.5
	m (H13)	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	3.15	3.15	3.15
	n (min.)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	5.3	5.3	5.3	5.3	5.3
nr. Of pillar acc. To DIN 5254		40	40	40	40	40	40	40	40	40	40	85	85	85

Nom. Size shaft d1		90	92	95	97	98	100	105	110	115	120	125	130	135
ring	s	3	3	3	3	3	3	4	4	4	4	4	4	4
	d3	84.5	86.5	89.5	91.5	92.5	94.5	98	108	108	113	118	123	128
	d4	108.5	111	114.8	116	117	120.2	125.8	131.2	137.3	143.1	149	154.4	159.8
groove	d2	86.5	88.5	91.5	93.5	94.5	96.5	101	106	111	116	121	126	131
	m (H13)	3.15	3.15	3.15	3.15	3.15	3.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
	n (min.)	5.3	5.3	5.3	5.3	5.3	5.3	6	6	6	6	6	6	6
nr. Of pillar acc. To DIN 5254		85	85	85	85	85	85	85	85	85	85	125	125	125

SIZE AVAILABLE			
d1	d1	d1	d1
45mm	60mm	78mm	98mm
47mm	62mm	80mm	100mm
48mm	63mm	82mm	105mm
50mm	65mm	85mm	110mm
	67mm	87mm	115mm
52mm	68mm	88mm	120mm
54mm			125mm
55mm	70mm	90mm	
56mm	72mm	92mm	130mm
57mm	75mm	95mm	135mm
58mm	77mm	97mm	

TECHNICAL DATA

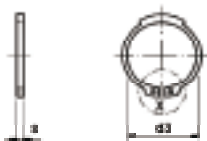


DETAIL X		
d1 300mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement.

WASHERS

RETAINING RINGS for SHAFT - NORMAL TYPE - STEEL



ISO :
DIN : 471
NEN : -
ANSI : -
BS : -
NF : E22-163

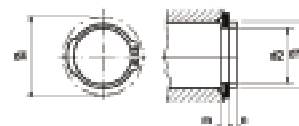


Nom. Size shaft d1	140	145	150	155	160	165	170	175	180	185	190	195
ring	s	4	4	4	4	4	4	4	4	4	4	4
	d3	133	138	142	146	151	155.5	160.5	165.5	170.5	175.5	180.5
	d4	165.2	170.6	177.3	182.3	188	193.4	198.4	203.4	210	215	220
groove	d2	136	141	145	150	155	160	165	170	175	180	185
	m (H13)	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
	n (min.)	6	6	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
nr. Of pillar acc. To DIN 5254	125	125	125	125	125	125	125	125	125	125	125	125

Nom. Size shaft d1	200	210	220	230	240	250	260	270	280	290	300
ring	s	4	5	5	5	5	5	5	5	5	5
	d3	190.5	198	208	218	228	238	245	255	265	275
	d4	230	240	250	260	270	280	294	304	314	324
groove	d2	195	204	214	224	234	244	252	262	272	282
	m (H13)	4.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15
	n (min.)	7.5	9	9	9	9	9	12	12	12	12
nr. Of pillar acc. To DIN 5254	125	125	125	125	125	125	125	125	125	125	125

SIZE AVAILABLE			
d1	d1	d1	d1
140mm	170mm	200mm	270mm
145mm	175mm	210mm	280mm
		220mm	
150mm	180mm	230mm	290mm
155mm	185mm	240mm	300mm
160mm	190mm	250mm	
165mm	195mm	260mm	

TECHNICAL DATA



DETAIL X		
d1 300mm	d1 170mm	d1 25mm

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement

WASHERS

RETAINING WASHER for SHAFT - STEEL



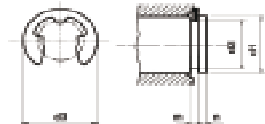
ISO :
DIN : 6799
NEN : -
ANSI : -
BS : -
NF : -



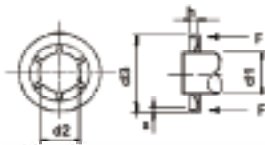
Nom. Size	groove	d2	1.2	1.5	1.9	2.3	3.2	4	5	6	7	8	9	10	12	15	19	24
Range shaft diameter di	from		1.4	2	2.5	3	4	5	6	7	8	9	10	11	13	16	20	25
	tilt		2	2.5	3	4	5	7	8	9	11	12	14	15	18	24	31	38
ring	s		0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.9	1	1.1	1.2	1.3	1.5	1.75	2
	a		1.01	1.28	1.61	1.94	2.7	3.34	4.11	5.26	5.84	6.52	7.63	8.32	10.45	12.61	15.92	21.88
	d3 (max)		3.25	4.25	4.8	6.3	7.3	9.3	11.3	12.3	14.3	16.3	18.8	20.4	23.4	29.4	37.6	44.6
groove	m		0.34	0.44	0.54	0.64	0.64	0.74	0.74	0.74	0.94	1.05	1.15	1.25	1.35	1.55	1.8	2.05
	n (min.)		0.6	0.8	1	1	1	1.2	1.2	1.2	1.5	1.8	2	2	2.5	3	3.5	4

SIZE AVAILABLE			
d2	d2	d1	d1
1.2mm	3.2mm	7mm	12mm
1.5mm	4mm	8mm	15mm
1.9mm	5mm	9mm	19mm
2.3mm	6mm	10mm	24mm

TECHNICAL DATA



STARLOCK - FIXING WASHER for SHAFTS (without CAP) - STEEL , Stainless Steel



ISO :
DIN :
NEN : -
ANSI : -
BS : -
NF : -



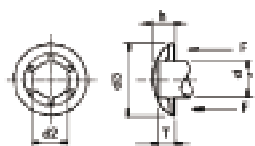
For nom. Size d1	3	4	5	6	8	10	12	16	20
d2	2.7	3.7	4.6	5	7.5	9.6	11.5	15.4	19.5
d3 (max)	9.9	11.6	11.6	15.4	15.4	18.6	25.2	28.4	36.7
h (max)	1.47	1.47	1.47	1.47	1.47	2.13	2.53	2.53	3.2
s	0.2	0.2	0.2	0.25	0.25	0.3	0.4	0.4	0.4
F	200	400	400	800	800	1000	2500	2500	3500

SIZE AVAILABLE			
For nom. size d1	For nom. size d1	For nom. size d1	For nom. size d1
3mm	6mm	10mm	16mm
4mm	8mm	12mm	20mm
5mm			

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement
F = allowable load in Newton

WASHERS

STARLOCK - FIXING WASHER for SHAFTS (with CAP type A)
STEEL & STAINLESS STEEL



ISO :
DIN :
NEN : -
ANSI : -
BS : -
NF :

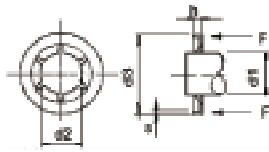


For nom. Size d1	3	4	5	6	8	10	12	16	20
d2	2.7	3.7	4.7	5.6	7.6	9.6	11.5	15.4	19.5
d3 (max)	10.92	12.65	12.65	16.46	16.46	20	26.23	29.6	38.53
h (max)	3.32	4.06	4.06	5.38	5.38	6.27	7.79	9.31	11.99
T (max)	2.54	3.05	3.05	4.06	4.06	4.5	6	7	8.7
F	200	400	400	800	800	1000	2500	2500	3500

SIZE AVAILABLE			
For nom. size d1	For nom. size d1	For nom. size d1	For nom. size d1
3mm	6mm	10mm	16mm
4mm	8mm	12mm	20mm
5mm			

WASHERS

STARLOCK - FIXING WASHER for SHAFTS (with CAP) - STEEL



ISO :
DIN :
NEN : -
ANSI : -
BS : -
NF :



For nom. Size d1	4	5	6	8	8
d2	3.7	4.7	5.6	7.6	7.6
d3 (max)	12.32	12.32	16.13	16.13	16.13
h (max)	5.59	5.59	7.24	7.24	7.24
T (max)	5.33	5.33	6.99	6.99	6.99
F	400	400	800	800	800

SIZE AVAILABLE		
For nom. size d1	For nom. size d1	For nom. size d1
4mm	6mm	10mm
5mm	8mm	

SIZE AVAILABLE			
For nom. size d1	For nom. size d1	For nom. size d1	For nom. size d1
3mm	6mm	10mm	16mm
4mm	8mm	12mm	20mm
5mm			

TECHNICAL DATA

- Starlock fixing washers are made from high-grade extra tempered spring steel and stainless steel
- Once fixing in position on shaft or pipe they are so secure that they cannot be removed without destruction
- Starlock fixing washers make the time consuming use of nuts with split pins, rivets, retaining rings etc. Unnecessary fixing problem are simply solved with Starlock fixing washers.



Fixing washer without Cap



Fixing washer with Cap

Warning : Electro-galvanizing of these products may cause hydrogen embrittlement

F = allowable load in Newton



THREADED BARS

CONTENTS

207 DIN 975 THREADED RODS 

208 B7 STUD BOLTS - B7 THREADED RODS - 2H HEXAGON NUTS
FOR THE PETROCHEMICAL - AND OFF - SHORE INDUSTRY 

208 THREADED RODS - A 193 GRADE B7
LENGTH - 1 METER & 3 METER: Steel 

209 STUD BOLTS with HEXAGON NUTS - STEEL 

210 STUD BOLTS with 2 HEXAGON NUTS - STEEL 

211 THREADED RODS - A 193 GRADE B7
LENGTH - 1 METER & 3 METER: Steel 

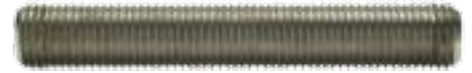
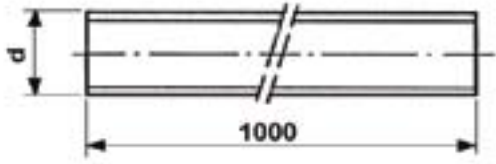
211 DOUBLE ENDS STUDS
With REDUCED SHANK and with HEXAGON NUTS 

212 DOUBLE END STUDS with REDUCED SHANK
WITH 2 HEXAGON HUTS - Steel 

THREADED BAR

DIN 975 THREADED RODS

Standard Length 3000 mm/1000 mm



SIZE Dia. x Pitch	Din 975 4.6 Steel	Din 975 ZP 4.6 Steel Zinc	Din 975 8.8 8.8 Steel	Din 975 B7 A193-B7 Steel	Din 975 10 10.9 Steel	Din 975 L 4.6 Steel Left Hand	Din 975 A2 304 Stainless	Din 975 A4 316 Stainless	Din 975 BR Brass	Din 975 PL 6.6 Plastic	Din 975 AL Aluminum	Weight/lbs. Per Meter Steel & Stainless
2 x .4	y	y	-	-	-	-	y	y	y	-	-	-
2.5 x .45	y	y	-	-	-	-	y	y	y	-	-	-
2.6 x .45	y	-	-	-	-	-	-	-	-	-	-	-
3 x .5	y	y	-	-	-	-	y	y	y	-	-	-
3.5 x .6	y	y	-	-	-	-	-	-	-	-	-	.10
4 x .7	y	y	y	y	-	y	y	y	y	y	-	.15
5 x .8	y	y	y	y	-	y	y	y	y	y	-	.20
6 x 1	y	y	y	y	y	y	y	y	y	y	-	.40
7 x 1	y	-	-	-	-	-	-	-	-	-	-	.60
8 x 1.25	y	y	y	y	y	y	y	y	y	y	-	.70
8 x 1	y	y	-	y	-	-	y	-	-	-	-	-
10 x 1.5	y	y	y	y	y	y	y	y	y	y	-	1
10 x 1.25	y	y	-	y	-	-	y	-	-	-	-	-
10 x 1	y	y	-	y	-	-	y	-	-	-	-	-
12 x 1.75	y	y	y	y	y	y	y	y	y	y	-	1.5
12 x 1.5	y	y	-	y	-	-	y	-	-	-	-	-
12 x 1.25	y	y	-	y	-	-	y	-	-	-	-	-
12 x 1	y	-	-	y	-	-	-	-	-	-	-	-
14 x 2	y	y	y	y	y	y	y	y	y	-	-	2
14 x 1.5	y	y	-	y	-	-	y	-	-	-	-	-
16 x 2	y	y	y	y	y	y	y	y	y	y	-	3
16 x 1.5	y	y	-	y	-	-	y	-	-	-	-	-
18 x 2.5	y	y	y	y	y	-	y	y	y	-	-	3.5
18 x 2	y	-	-	-	-	-	-	-	-	-	-	-
18 x 1.5	y	-	-	y	-	-	y	-	-	-	-	-
20 x 2.5	y	y	y	y	y	y	y	y	y	y	-	4.5
20 x 2	y	-	-	-	-	-	-	-	-	-	-	-
20 x 1.5	y	-	-	y	-	y	y	-	-	-	-	-
22 x 2.5	y	y	y	y	y	-	y	-	-	-	-	5.5
22 x 1.5	y	-	-	y	-	-	-	-	-	-	-	-
24 x 3	y	y	y	y	y	-	y	y	y	-	-	6.5
24 x 2	y	-	-	y	-	y	-	-	-	-	-	-
24 x 1.5	y	-	-	y	-	-	y	-	-	-	-	-
27 x 3	y	y	y	y	-	-	y	y	y	-	-	8.5
27 x 1.5	y	-	-	y	-	-	-	-	-	-	-	-
30 x 3.5	y	y	y	y	y	-	y	y	y	-	-	10.5
30 x 1.5	y	-	-	y	-	-	-	-	-	-	-	-
33 x 3.5	y	-	-	y	-	-	y	y	y	-	-	13
36 x 4	y	y	y	y	-	-	y	y	y	-	-	15
39 x 4	y	-	-	-	-	-	-	-	-	-	-	18
42 x 4.5	y	-	-	y	-	-	-	-	-	-	-	21
45 x 4.5	y	-	-	y	-	-	-	-	-	-	-	24
48 x 5	y	-	-	-	-	-	-	-	-	-	-	27
52 x 5	y	-	-	-	-	-	-	-	-	-	-	-
56 x 5.5	y	-	-	-	-	-	-	-	-	-	-	32

"y " means stock availability

THREADED BAR

B7 STUD BOLTS - B7 THREADED RODS - 2H HEXAGON NUTS FOR THE PETROCHEMICAL - and OFF-SHORE INDUSTRY

CHEMICAL COMPOSITION								
Standard	Grade	Most important elements			Corresponding materials			
		C	Cr	Mo	Germany		United Kingdom	France
					DIN	Werkst.nr.		
ASTM A 193	B7	0.37-0.49	0.75-1.20	0.15-0.25	42CrMo4	1.723	1506-621GrH	42 CD 4
ASTM A 194	2H	min. 0.4	-	-	C 45	1.050	1506-162	C45d

MECHANICAL PROPERTIES								
Grade		Tensile strength min.	0.2% Yield strength min.	Elongation min. %	Contraction min. %	Hardness		Tempering temp. min. °C
B7	N/mm²	860	720	16	50	HB	HRC	593
	psi	125000	105000			-	-	
2H	max.	-	-	-	-	352	38	-
	min.					248	24	

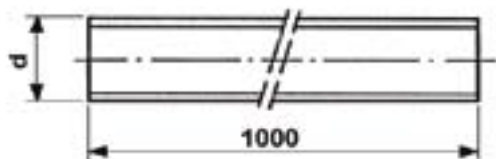
GRADES: Stud bolts and threaded rods grade B7 according to the American Standard ASTM A 193 and associated hexagon nuts grade 2H according to ASTM A 194 are the most popular grade and available form stock. Grade (ASTM) is an American designation covering the chemical composition as well as the mechanical properties.

Temperature range: from min. - 46° C to max. + 538° C (for guidance)

Certificates: occasionally with the delivery of stud bolts a 3.1B certificates according to DIN 50049 is required. This is an inspection certificate of the manufacturer comprising the composition of the material and the mechanical properties per heat number. In order that the customers can be assured of a correct relationship between product and the testing document, the labels carry the heat number. The Dutch 'Deist voor heat Stoomwezen' accepts this certificate for the sizes up and including 2 inch rasp. M52, delivery with a 3.1 C certificate is also possible on request.

Specials: less usual grades like B16 for the higher temperature application, the austenitic stainless steel B8 and ASTM A 320 grade L7 for lower temperatures can be supplied on request. Stud bolts and nuts with a PTFE flour carbon coating (teflon coating, blue coating, etc.) can also be supplied on request.

THREADED RODS - A 193 GRADE B7 LENGTH - 1 METER & 3 METER: Steel



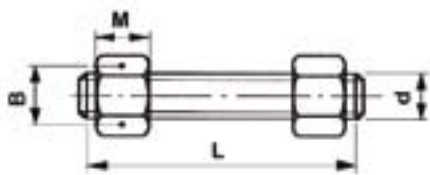
d	Inch	1/2	5/8	3/4	7/8	1	1 1/8
Thread per inch	mm	12.7	15.9	19.05	22.2	25.4	28.6
		13	11	10	9	8	8

d	Inch	1 1/4	1 3/8	1 1/2
Thread per inch	mm	31.75	34.9	38.1

SIZE AVAILABLE		
d	d	d
1/2	1"	1 3/8
5/8	1 1/8	1 1/2
3/4	1 1/4	
7/8		

THREADED BAR

STUD BOLTS with HEXAGON NUTS - STEEL



ISO : -
DIN : -
ANSI : -
BSI : - 4882
NF : -

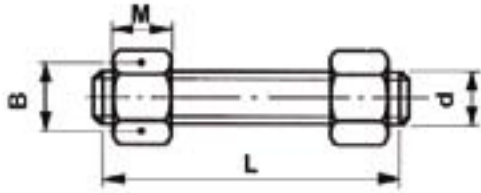


d	M12	M14	M16	M20	M22	M24
P	1.75	2	2	2.5	2.5	3
M ^ø	12	14	16	20	22	24
B	19	22	24	30	32	36

SIZE AVAILABLE		
d x L	d x L	d x L
M12 x 55	M16 x 150	M22 x 120
M12 x 65		M22 x 125
M12 x 70	M20 x 75	M22 x 130
M12 x 75	M20 x 85	M22 x 135
M12 x 80	M20 x 90	M22 x 140
M12 x 90	M20 x 95	M22 x 145
M12 x 95	M20 x 100	M22 x 150
M12 x 100	M20 x 105	M22 x 160
	M20 x 110	M22 x 165
M14 x 65	M20 x 115	M22 x 170
M14 x 75	M20 x 120	M22 x 180
M14 x 80	M20 x 125	M22 x 200
M14 x 90	M20 x 130	
M14 x 100	M20 x 135	M24 x 115
	M20 x 140	M24 x 125
M16 x 65	M20 x 145	M24 x 130
M16 x 70	M20 x 150	M24 x 140
M16 x 75	M20 x 160	M24 x 150
M16 x 80	M20 x 170	M24 x 160
M16 x 85	M20 x 180	M24 x 165
M16 x 90	M20 x 190	M24 x 170
M16 x 95	M20 x 200	M24 x 180
M16 x 100	M20 x 210	M24 x 190
M16 x 110		M24 x 200
M16 x 115	M22 x 95	M24 x 215
M16 x 120	M22 x 100	M24 x 230
M16 x 125	M22 x 110	M24 x 250
M16 x 140	M22 x 115	

THREADED BAR

STUD BOLTS with 2 HEXAGON NUTS - STEEL



ISO : -
DIN : -
ANSI : -
BSI : - 4882
NF : -



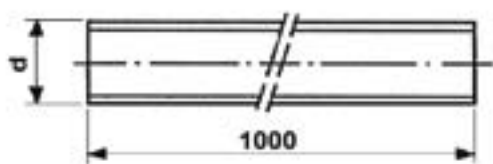
d	Inch	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
	mm	12.7	15.9	19.05	22.2	25.4	28.6	31.75
Thread per inch		13	11	10	9	8	8	8
M		12.8	16.02	19.25	22.47	25.7	28.93	31.77
B	inch	7/8	11/16	11/4	1 7/16	1 5/8	1 13/16	2
	mm	22.2	27	31.75	36.5	41.3	46.05	50.8

d	Inch	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
	mm	34.9	38.1	41.3	44.45	47.65	50.8
Thread per inch		8	8	8	8	8	8
M		35	38.22	41.25	44.47	47.65	51.13
B	inch	2 13/16	2 3/8	2 9/16	2 3/4	2 15/16	3 1/8
	mm	55.55	60.3	65.1	69.85	74.6	79.4

SIZE AVAILABLE			
d x L	d x L	d x L	d x L
1/2 x 2"	3/4 x 5 1/4	1" x 5"	1 1/4 x 7"
1/2 x 2 1/4	3/4 x 5 1/2	1" x 5 1/4	1 1/4 x 7 1/4
1/2 x 2 1/2	3/4 x 5 3/4	1" x 5 1/2	1 1/4 x 7 1/2
1/2 x 2 3/4	3/4 x 6"	1" x 5 3/4	1 1/4 x 7 3/4
1/2 x 3"	3/4 x 6 1/4	1" x 6"	
1/2 x 3 1/4	3/4 x 6 1/2	1" x 6 1/4	1 1/4 x 8"
1/2 x 3 1/2	3/4 x 6 3/4	1" x 6 1/2	1 1/4 x 8 1/4
1/2 x 3 3/4	3/4 x 7"	1" x 6 3/4	1 1/4 x 8 1/2
1/2 x 4"	3/4 x 7 1/4	1" x 7"	1 1/4 x 8 3/4
1/2 x 4 1/4	3/4 x 7 1/2	1" x 7 1/4	1 1/4 x 9"
1/2 x 4 1/2	3/4 x 8"	1" x 7 1/2	1 1/4 x 9 1/2
1/2 x 4 3/4	3/4 x 8 1/4	1" x 7 3/4	1 1/4 x 10"
1/2 x 5"	3/4 x 8 1/2	1" x 8"	1 1/4 x 11"
	3/4 x 8 3/4	1" x 8 1/4	1 1/4 x 12"
	3/4 x 9"	1" x 8 1/2	1 1/4 x 13"
5/8 x 2 1/4	3/4 x 9 1/2	1" x 8 3/4	
5/8 x 2 1/2	3/4 x 10"	1" x 9"	1 3/8 x 9"
5/8 x 2 3/4		1" x 9 1/4	1 1/8 x 9 1/2
5/8 x 3"		1" x 9 1/2	1 3/8 x 10"
5/8 x 3 1/4	7/8 x 3 1/2	1" x 9 3/4	1 3/8 x 11"
5/8 x 3 1/2	7/8 x 3 3/4	1" x 10"	1 3/8 x 12"
5/8 x 3 3/4	7/8 x 4"	1" x 11"	
5/8 x 4"	7/8 x 4 1/4	1" x 12"	1 1/2 x 8"
5/8 x 4 1/4	7/8 x 4 1/2		1 1/2 x 9 1/2
5/8 x 4 1/2	7/8 x 4 3/4		1 1/2 x 10"
5/8 x 4 3/4	7/8 x 5"	1 1/8 x 5"	1 1/2 x 10 1/2
5/8 x 5"	7/8 x 5 1/4	1 1/8 x 5 1/4	1 1/2 x 10 3/4
5/8 x 5 1/4	7/8 x 5 1/2	1 1/8 x 5 1/2	1 1/2 x 11"
5/8 x 5 1/2	7/8 x 5 3/4	1 1/8 x 5 3/4	1 1/2 x 12"
5/8 x 5 3/4	7/8 x 6"	1 1/8 x 6"	
5/8 x 6"	7/8 x 6 1/4	1 1/8 x 6 1/4	1 5/8 x 10"
5/8 x 6 1/4	7/8 x 6 1/2	1 1/8 x 6 1/2	1 5/8 x 11"
5/8 x 6 1/2	7/8 x 6 3/4	1 1/8 x 6 3/4	1 5/8 x 12"
5/8 x 6 3/4	7/8 x 7"	1 1/8 x 7"	1 5/8 x 13"
5/8 x 7"	7/8 x 7 1/4	1 1/8 x 7 1/4	
5/8 x 8"	7/8 x 7 1/2	1 1/8 x 7 1/2	1 3/4 x 11"
	7/8 x 7 3/4	1 1/8 x 8"	1 3/4 x 12"
3/4 x 2 1/4	7/8 x 8"	1 1/8 x 8 1/2	
3/4 x 2 3/4	7/8 x 8 1/4	1 1/8 x 9"	
3/4 x 3"	7/8 x 8 1/2	1 1/8 x 9 1/2	1 7/8 x 12"
3/4 x 3 1/4	7/8 x 8 3/4	1 1/8 x 10"	1 7/8 x 13"
3/4 x 3 1/2	7/8 x 9"	1 1/8 x 11"	1 7/8 x 14"
3/4 x 3 3/4	7/8 x 9 1/2	1 1/8 x 12"	
3/4 x 4"	7/8 x 10"		2" x 7 1/2
3/4 x 4 1/4		1 1/4 x 6"	2" x 13"
3/4 x 4 1/2	1" x 4"	1 1/4 x 6 1/4	2" x 14"
3/4 x 4 3/4	1" x 4 1/4	1 1/4 x 6 1/2	2" x 15"
3/4 x 5"	1" x 4 1/2	1 1/4 x 6 3/4	

THREADED BAR

THREADED RODS - A 193 GRADE B7
LENGTH - 1 METER & 3 METER: Steel



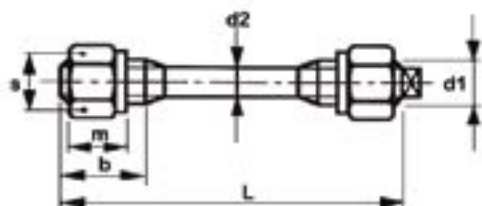
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DIN : -
ANSI : -
BSI : -
NF : -



d	M10	M12	M16	M20	M22	M24	M27	M30	M33	M36	M39	M42	M45	M48	M52
P	1.5	1.75	2	2.5	2.5	3	3	3.5	3.5	4	4	4.5	4.5	5	5

SIZE AVAILABLE		
d	d	d
M10	M24	M39
M12	M27	M42
M16	M30	M45
M20	M33	M48
M22	M36	M52

DOUBLE END STUDS with REDUCED SHANK
WITH 2 HEXAGON NUTS - Steel



ISO : -
DIN : - 2510 L/NF
ANSI : -
BSI : -
NF : -



d1	M12	M16	M20	M24	M27	M30
P	1.75	2	2.5	3	3	3.5
d2	8.5	12	15	18	20.5	23
b	20	23	28	32	35	39
m	12	16	20	24	27	30
s	22	27	32	36	41	46

SIZE AVAILABLE		
d1 x L	d1 x L	d1 x L
M12 x 65	M20 x 95	M39
M12 x 70	M20 x 100	M42
M12 x 75	M20 x 105	105
M12 x 80	M20 x 110	M48
	M20 x 120	
M16 x 75		
M16 x 80	M24 x 110	
M16 x 85	M24 x 115	
M16 x 90	M24 x 125	
M16 x 100	M24 x 130	
M16 x 105	M24 x 140	
	M24 x 150	
M12 x 65	M36	M52

ITEMS CODE NUMBER		
d	d	d
1/2	1 1/8	1 3/4
5/8	1 1/4	1 7/8
3/4	1 3/8	2"
7/8	1 1/2	
1"	1 5/8	

THREADED BAR

DOUBLE ENDS STUDS

With REDUCED SHANK and with HEXAGON NUTS

Material Quality: low temperature resistant, high temperature resistant, high pressure hydrogenation, corrosion resistant and anti - magnetic (permeability 1,05G/Oe)

High requirement: by means of annealed, normalized, carbide - solution, quenched and tempered, warm-cold formed and precipitation hardened.

Quality: double end studs are manufactured by approval of TÜV and also acc. to AD regulation WO and TRD sheet 100. When ordering double ends studs please mention always the material code. (see marking signs table below). the associated hexagon nuts are supplied separately. The packaging and packing list are only mentioned by the material code of the bolts. For applications and calculations of double end nuts at pressure vessels.

Application: double end studs are generally applied in the stringent construction sectors like nuclear reactor s and technology, turbines, boilers, high pressure tanks, high- capacity chemical vessels, chemical apparatus, ship building oil industry, petrochemistry, refrigeration plants, pipe lines, instruments, motor construction and offshore techniques.

Certificates: upon special request the inspection certificate 3.1A, 31 B and 3.1C can be delivered according DIN 50049 (= EN 10204).

Operation temperature ranges and bolt/nut combination							
Specs.			Temperature		Specs.		Marking sign acc. to DIN 267-13
					bolts	nuts	
DIN 267 - 13	AD MERBLATTW7	DIN 17240	+	700 ° C	2.495	2.495	SB/SB
			+	650 ° C	1.499	1.499	S/S
					1.498	1.498	
			+	580 ° C	1.492	1.492	V/V
					1.491	1.492	VW/V
			+	540 ° C	1.771	1.771	GA/GA
			+	500 ° C	1.771	1.726	GA/G
					1.771	1.771	GB/GA
			+	400 ° C	1.726	1.726	G/G
					1.726	1.118	G/YK
			+	350 ° C	1.118	1.118	YK/YK
					1.118	1.050	YK/Y
	DIN-ISO	898-1	+	350 ° C			8.8
							5.6
			-	10 ° C			4.6-2
	AD-M. W10	DIN 17280	-	60 ° C	1.722	1.722	KA/KA
			-	120 ° C	1.568	1.568	KB/KB
			-	196 ° C	1.691	1.691	

MATERIAL PROPERTIES										
Marking sign	Designation			Important elements		temperature	Tensile N/ mm ²	Yield min. N/ mm ²	Stretch % min.	Notched bar process joule
		C	Cr	Mo	V					
YK	C35	0.32-0,39	-	-	-	+350°C	500-600	280	22	55
G	24 CrMO 5	0.20-0,28	0.90-1,20	0.20-0.35	-	+400°C	600-750	440	18	103
GA	21 CrMoV 57	0.17-0,25	1,20-1,50	0.65-0.80	0.25-0.35	+540°C	700-850	550	16	69



SOCKET HEADS

CONTENTS

- 215 HEXAGONAL SOCKET BUTTON HEAD CAP SCREWS
Steel 241 and Steel Zinc Plated - Full Threaded Steel



- 215 HEXAGONAL SOCKET COUNTERSUNK HEAD SCREW
Half Threaded Steel - Steel , Zinc Plated



- 216 HEXAGONAL SOCKET COUNTERSUNK HEAD SCREW
Half Threaded Steel - Steel 253 and Zinc Plated 252



- 217 HEXAGONAL SOCKET HEAD CAP SCREW
Full Threaded Steel, Zinc Plated and Yellow Passivated



- 217 HEXAGON SOCKET SET SCREWS WITH CUP POINT
Steel, Steel Zinc Plated & Yellow Passivated



- 218 HEXAGON SOCKET SET SCREWS WITH CONE POINT
Steel and Steel Zinc Plated



- 218 HEXAGON SOCKET SET SCREWS WITH DOG POINT
Steel and Steel Zinc Plated



- 219 HEXAGON SOCKET SET SCREWS WITH FLAT POINT
Steel and Steel Zinc Plated



- 219 HEXAGON SOCKET SET SCREWS WITH KNURLED
CUP POINT STEEL

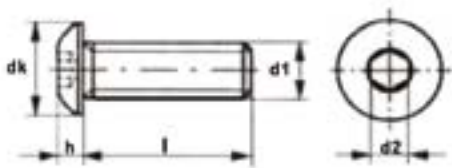


- 220 HEXAGON SOCKET SET SCREWS WITH FLAT POINT
METRIC FINE PITCH THREAD - STEEL



SOCKET HEAD

HEXAGONAL SOCKET BUTTON HEAD CAP SCREWS Steel 241 and Steel Zinc Plated - Full Threaded Steel



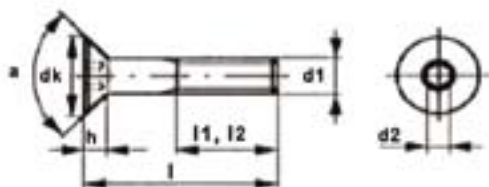
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DIN : 7991
ANSI : -
BS : -



d1	M3	M4	M5	M6	M8	M10	M12	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2
dk	5.7	7.6	9.5	10.6	14	17.5	21	2.8
h	1.65	2.2	2.75	3.3	4.4	5.5	6.6	8.8
d2	2	2.5	3	4	5	6	8	10

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 5	M4 x 10	M5 x 10	M6 x 8	M6 x 55	M8 x 40	M10 x 35	M12 x 35	M16 x 30
M3 x 6	M4 x 12	M5 x 12	M6 x 10	M6 x 60	M8 x 45	M10 x 40	M12 x 40	M16 x 35
M3 x 8	M4 x 16	M5 x 16	M6 x 12		M8 x 50	M10 x 45	M12 x 45	M16 x 40
M3 x 10	M4 x 20	M5 x 20	M6 x 16	M8 x 8	M8 x 55	M10 x 50	M12 x 50	M16 x 45
M3 x 12	M4 x 25	M5 x 25	M6 x 20	M8 x 10	M8 x 60	M10 x 55	M12 x 55	M16 x 60
M3 x 16	M4 x 30	M5 x 30	M6 x 25	M8 x 12		M10 x 60	M12 x 60	M16 x 70
M3 x 20	M4 x 35	M5 x 35	M6 x 30	M8 x 16	M10 x 12		M12 x 70	M16 x 80
M3 x 25	M4 x 40	M5 x 40	M6 x 35	M8 x 20	M10 x 16	M12 x 16	M12 x 80	
		M5 x 45	M6 x 40	M8 x 25	M10 x 20	M12 x 20		
M4 x 6	M5 x 6		M6 x 45	M8 x 30	M10 x 25	M12 x 25		
M4 x 8	M5 x 8	M6 x 6	M6 x 50	M8 x 35	M10 x 30	M12 x 30		

HEXAGONAL SOCKET COUNTERSUNK HEAD SCREW Half Threaded Steel - Steel , Zinc Plated



ISO : -
DIN : 7991
ANSI : -
BS : -

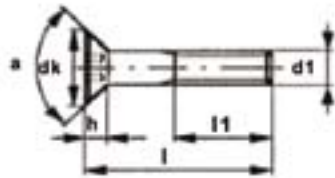


d1	M12	M14	M16	M20	M24
P	1.75	2	2	2.5	3
l1	30	34	38	46	54
l2	36	40	44	52	60
dk	24	27	30	36	39
h (max)	6.5	7	7.5	8.5	14
a	90	90	90	90	90
d2	8	10	10	12	14

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M12 x 20	M12 x 50	M14 x 25	M14 x 80	M16 x 30	M16 x 80	M20 x 50	M20 x 140	M24 x 90
M12 x 25	M12 x 55	M14 x 30	M14 x 90	M16 x 35	M16 x 90	M20 x 50	M20 x 160	M24 x 100
M12 x 30	M12 x 60	M14 x 35	M14 x 100	M16 x 40	M16 x 100	M20 x 70	M20 x 200	M24 x 120
M12 x 35	M12 x 70	M14 x 40	M14 x 90	M16 x 45		M20 x 80	M24 x 50	M24 x 140
M12 x 40	M12 x 80	M14 x 50	M14 x 100	M16 x 50	M20 x 30	M20 x 90	M24 x 60	M24 x 160
M12 x 45	M12 x 90	M14 x 60		M16 x 60	M20 x 35	M20 x 100	M24 x 70	M24 x 180
	M12 x 100	M14 x 70	M16 x 25	M16 x 70	M20 x 40	M20 x 120	M24 x 80	M24 x 200

SOCKET HEAD

HEXAGONAL SOCKET COUNTERSUNK HEAD SCREW Half Threaded Steel - Steel 253 and Zinc Plated 252



ISO : -
DIN : 7991
ANSI : -
BS : -

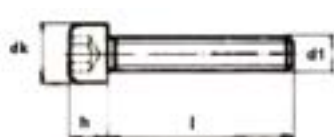


d1	M3	M4	M5	M6	M8	M10	M12	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2
l1	12	14	16	18	22	26	30	38
dk	6	8	10	12	16	20	24	30
h (max)	1.7	2.3	2.8	3.3	4.4	5.5	6.5	7.5
a	90	90	90	90	90	90	90	90
d2	2	2.5	3	4	5	6	8	10

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 6	M4 x 8	M5 x 8	M6 x 8	M6 x 70	M8 x 50	M10 x 40	M12 x 20	M16 x 30
M3 x 8	M4 x 10	M5 x 10	M6 x 10	M6 x 80	M8 x 60	M10 x 45	M12 x 25	M16 x 35
M3 x 10	M4 x 12	M5 x 12	M6 x 12		M8 x 70	M10 x 50	M12 x 30	M16 x 40
M3 x 12	M4 x 16	M5 x 16	M6 x 16	M8 x 10	M8 x 80	M10 x 55	M12 x 35	M16 x 45
M3 x 16	M4 x 20	M5 x 20	M6 x 20	M8 x 12	M8 x 90	M10 x 60	M12 x 40	M16 x 50
M3 x 20	M4 x 25	M5 x 25	M6 x 25	M8 x 16	M8 x 100	M10 x 65	M12 x 45	M16 x 55
M3 x 25	M4 x 30	M5 x 30	M6 x 30	M8 x 20		M10 x 70	M12 x 50	M16 x 60
M3 x 30	M4 x 35	M5 x 35	M6 x 35	M8 x 25	M10 x 16	M10 x 75	M12 x 55	M16 x 70
M3 x 40	M4 x 40	M5 x 40	M6 x 40	M8 x 30	M10 x 20	M10 x 80	M12 x 60	M16 x 80
M3 x 50	M4 x 50	M5 x 45	M6 x 45	M8 x 35	M10 x 25	M10 x 90	M12 x 70	
	M4 x 60	M5 x 50	M6 x 50	M8 x 40	M10 x 30	M10 x 100	M12 x 80	
M4 x 5	M4 x 70	M5 x 70	M6 x 60	M8 x 45	M10 x 35			

SOCKET HEAD

HEXAGONAL SOCKET HEAD CAP SCREW Full Threaded Steel, Zinc Plated and Yellow Passivated



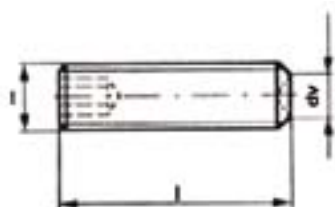
ISO : -
DIN : 7991
ANSI : -
BS : -



d1	M3	M4	M5	M6	M8	M10	M12
P	0.5	0.7	0.8	1	1.25	1.5	1.75
dk (max)	5.5	7	8.5	10	13	16	18
h (max)	3	4	5	6	8	10	12
d2	2.5	3	4	5	6	8	10

SIZE AVAILABLE							
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 25	M4 x 40	M5 x 35	M6 x 35	M6 x 60	M8 x 60	M10 x 60	M12 x 60
	M4 x 50	M5 x 40	M6 x 40		M8 x 80	M10 x 70	M12 x 80
M4 x 30	M5 x 30	M5 x 50	M6 x 50	M8 x 40		M10 x 80	
				M8 x 50	M10 x 50		

HEXAGON SOCKET SET SCREWS WITH CUP POINT Steel, Steel Zinc Plated & Yellow Passivated



ISO : 4029
DIN : - 916
ANSI : B18.3.6M
BS : 4168-5

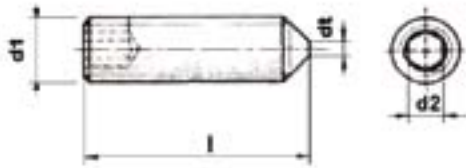


	M2	M3	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24
	0.4	0.5	0.7	0.8	1	1.25	1.5	1.75	2	2	2.5	2
	1	1.4	2	2.5	3	5	6	8	9	10	14	16
	0.9	1.5	2	2.5	3	4	5	6	6	8	10	12

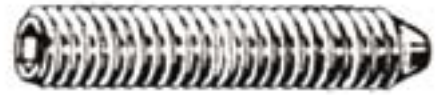
SIZE AVAILABLE												
	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
	M3 x 3	M3 x 25	M4 x 16	M5 x 12	M6 x 12	M8 x 8	M8 x 40	M10 x 25	M12 x 16	M14 x 16	M16 x 20	M20 x 25
	M3 x 4	M3 x 30	M4 x 20	M5 x 16	M6 x 16	M8 x 10	M8 x 50	M10 x 30	M12 x 20	M14 x 20	M16 x 25	M20 x 30
	M3 x 5		M4 x 25	M5 x 20	M6 x 20	M8 x 12	M8 x 60	M10 x 35	M12 x 25	M14 x 25	M16 x 30	M20 x 40
	M3 x 6	M4 x 4	M4 x 30	M5 x 25	M6 x 25	M8 x 16		M10 x 40	M12 x 30	M14 x 30	M16 x 35	M20 x 50
	M3 x 8	M4 x 5		M5 x 30			M10 x 8	M10 x 50	M12 x 35	M14 x 35	M16 x 40	M20 x 60
	M3 x 10	M4 x 6	M5 x 5		M6 x 30	M8 x 20	M10 x 10	M10 x 60	M12 x 40	M14 x 40	M16 x 50	
	M3 x 12	M4 x 8	M5 x 6	M6 x 6	M6 x 35	M8 x 25	M10 x 12		M12 x 50	M14 x 50	M16 x 60	M24 x 40
	M3 x 16	M4 x 10	M5 x 8	M6 x 8	M6 x 40	M8 x 30	M10 x 16	M12 x 10	M12 x 60	M14 x 60		M24 x 45
	M3 x 20	M4 x 12	M5 x 10	M6 x 10	M6 x 50	M8 x 35	M10 x 20	M12 x 12	M12 x 70		M20 x 20	M24 x 60

SOCKET HEAD

HEXAGON SOCKET SET SCREWS WITH CONE POINT Steel and Steel Zinc Plated



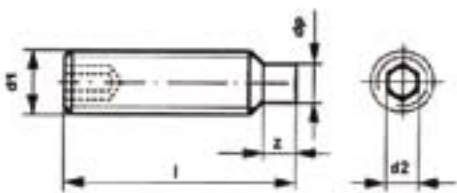
ISO : 4027
DIN : - 914
ANSI : B18.3.6M
BS : 4168-3



d1	M3	M4	M5	M6	M8	M10	M12	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2
dt (max)	-	-	-	1.5	2	2.5	3	4
d2	1.5	2	2.5	3	4	5	6	8

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 3	M3 x 20	M4 x 25	M5 x 20	M6 x 16	M8 x 12	M10 x 16	M12 x 16	M16 x 16
M3 x 4			M5 x 25	M6 x 20	M8 x 16	M10 x 20	M12 x 20	M16 x 20
M3 x 5	M4 x 4	M5 x 6		M6 x 25	M8 x 20	M10 x 25	M12 x 25	M16 x 25
M3 x 6	M4 x 8	M5 x 8	M6 x 6	M6 x 30	M8 x 25	M10 x 30	M12 x 30	M16 x 30
M3 x 8	M4 x 10	M5 x 10	M6 x 8		M8 x 30	M10 x 40	M12 x 40	M16 x 35
M3 x 10	M4 x 12	M5 x 12	M6 x 10	M8 x 8	M8 x 40	M10 x 50	M12 x 50	M16 x 40
M3 x 12	M4 x 16		M6 x 12	M8 x 10				M16 x 50
M3 x 16	M4 x 20	M5 x 16			M10 x 12			M16 x 60

HEXAGON SOCKET SET SCREWS WITH DOG POINT Steel and Steel Zinc Plated



ISO : 4028
DIN : - 915
ANSI : B18.3.6M
BS : 4168-4

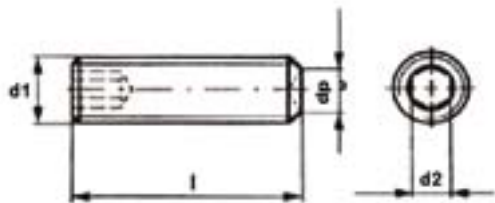


d1	M3	M4	M5	M6	M8	M10	M12	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2
dp (max)	2	2.5	3.5	4	5.5	7	8.5	12
d2	1.5	2	2.5	3	4	5	6	8
z short 1 (min.)	1.75	1	1.25	1.5	2	2.5	3	4
z short 1 (max.)	1	1.25	1.5	1.75	2.25	2.75	3.25	4.3
z long 2 (min.)	1.5	2	2.5	3	4	6	6	8
z long 2 (max.)	1.75	2.25	1.75	3.25	4.3	5.3	6.3	8.36

SIZES AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 3	M3 x 20	M4 x 25	M5 x 25	M6 x 25	M8 x 25	M10 x 20	M12 x 16	M16 x 20
M3 x 4		M5 x 6		M6 x 30	M8 x 30	M10 x 25	M12 x 20	M16 x 25
M3 x 5	M4 x 6	M5 x 8	M6 x 6		M8 x 35	M10 x 30	M12 x 25	M16 x 30
M3 x 6	M4 x 8	M5 x 10	M6 x 8	M8 x 10	M8 x 40	M10 x 40	M12 x 30	M16 x 35
M3 x 8	M4 x 10	M5 x 12	M6 x 10	M8 x 12		M10 x 50	M12 x 40	M16 x 40
M3 x 10	M4 x 12		M6 x 12	M8 x 16	M10 x 12		M12 x 50	M16 x 50
M3 x 12	M4 x 16	M5 x 16	M6 x 16	M8 x 20	M10 x 16	M12 x 12	M16 x 16	M16 x 60
M3 x 16	M4 x 20	M5 x 20	M6 x 20					

SOCKET HEAD

HEXAGON SOCKET SET SCREWS WITH FLAT POINT Steel and Steel Zinc Plated



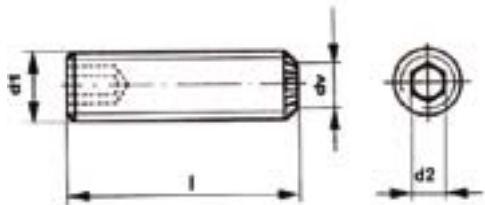
ISO : 4026
DIN : - 913
NEN : 2341
ANSI : B18.3.6M
BS : 4168-2



d1	M3	M4	M5	M6	M8	M10	M12	M16
P	0.5	0.7	0.8	1	1.25	1.5	1.75	2
dv	2	2.5	3.5	4	5.5	7	8.5	12
d2	1.5	2	2.5	3	4	5	6	8

SIZES AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 3	M3 x 20	M4 x 16	M5 x 16	M6 x 16	M8 x 10	M10 x 12	M12 x 16	M16 x 20
M3 x 4		M4 x 20	M5 x 20	M6 x 20	M8 x 12	M10 x 16	M12 x 20	M16 x 25
M3 x 5	M4 x 4	M4 x 25	M5 x 25	M6 x 25	M8 x 16	M10 x 20	M12 x 25	M16 x 30
M3 x 6	M4 x 5		M5 x 30	M6 x 30	M8 x 20	M10 x 25	M12 x 30	M16 x 35
M3 x 8	M4 x 6	M5 x 6		M6 x 35	M8 x 25	M10 x 30	M12 x 40	M16 x 40
M3 x 10	M4 x 8	M5 x 8	M6 x 8	M6 x 40	M8 x 30	M10 x 40	M12 x 50	M16 x 50
M3 x 12	M4 x 10	M5 x 10	M6 x 10		M8 x 40	M10 x 50		M16 x 60
M3 x 16	M4 x 12	M5 x 12	M6 x 12	M8 x 8				

HEXAGON SOCKET SET SCREWS WITH KNURLED CUP POINT STEEL



ISO : 4029
DIN : - 916
NEN : 2343
ANSI : B18.3.6M
BS : 4168-5

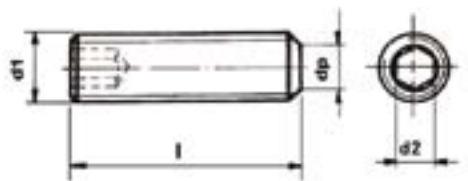


d1	M3	M4	M5	M6	M8
P	0.5	0.7	0.8	1	1.25
dv	1.4	2	2.5	3	5
d2	1.5	2	2.5	3	4

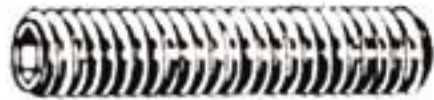
SIZES AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M3 x 4	M3 x 10	M4 x 8	M5 x 5	M5 x 12	M6 x 8	M6 x 16	M8 x 8	M8 x 20
M3 x 5		M4 x 10	M5 x 6	M5 x 16	M6 x 8	M6 x 20	M8 x 10	M8 x 25
M3 x 6	M4 x 5	M4 x 12	M5 x 8		M6 x 10	M6 x 25	M8 x 12	M8 x 30
M3 x 8	M4 x 6	M4 x 16	M5 x 10	M5 x 20	M6 x 12		M8 x 16	

SOCKET HEAD

HEXAGON SOCKET SET SCREWS WITH FLAT POINT METRIC FINE PITCH THREAD - STEEL



ISO : 4026
DIN : - 913
NEN : 2341
ANSI : B18.3.6M
BS : 4168-2



d1	M8	M10	M12	M16
P	1.25	1.5	1.75	2
dp (max)	5.5	7	8.5	12
d2	4	5	6	8

SIZES AVAILABLE		
d1 x l	d1 x l	d1 x l
M8 x 1.00 x 10	M10 x 1.25 x 16	M12 x 1.50 x 25
M8 x 1.00 x 12	M10 x 1.25 x 20	M12 x 1.50 x 30
M8 x 1.00 x 16	M10 x 1.25 x 25	M12 x 1.50 x 40
M8 x 1.00 x 20	M10 x 1.25 x 30	M12 x 1.50 x 50
M8 x 1.00 x 25	M10 x 1.25 x 40	
M8 x 1.00 x 30	M10 x 1.25 x 50	
M8 x 1.00 x 40		M16 x 1.50 x 20
M8 x 1.00 x 50	M12 x 1.50 x 10	M16 x 1.50 x 25
	M12 x 1.50 x 12	M16 x 1.50 x 30
M8 x 1.25 x 10	M12 x 1.50 x 16	M16 x 1.50 x 40
M8 x 1.25 x 12	M12 x 1.50 x 20	M16 x 1.50 x 50



PINS & KEYS

CONTENTS

224 TAPER PINS - TURNED - STEEL 

225 TAPER PINS with THREAD and CONSTANT THREADED PART - STEEL 

225 TAPER PINS with INTERNAL THREAD - GROUND - STEEL 

226 PARALLEL PINS (DOWEL PINS) - HARDENED STEEL 

226 PARALLEL PINS with INTERNAL THREAD - HARDENED STEEL 

227 GROOVE PINS, FULL LENGTH PARALLEL GROOVED with PILOT - STEEL 

228 GROOVE PINS, FULL LENGTH TAPER GROOVED - STEEL 

229 GROOVE PINS, HALF LENGTH TAPER GROOVED - STEEL 

230 GROOVE PINS, FULL LENGTH PARALLEL GROOVED with CHAMFER - STEEL 

231 GROOVE PINS, HALF LENGTH REVERSE GROOVED - STEEL 

232 GROOVE PINS, THIRD LENGTH CENTER GROOVED - STEEL 

233 SPRING TYPE STRAIGHT PINS SLOTTED - HEAVY TYPE
STEEL and STEEL ZINC PLATED 

234 SPIROL PINS MEDIUM DUTY - STEEL 

235 SPIROL PINS HEAVY DUTY - STEEL 

235 ROUND HEAD GROOVED PINS - STEEL 

236 SPLIT PINS (Cotter Pins) - STEEL, STEEL ZINC Plated and YELLOW PASSIVATED 

237 SPRING COTTERS OF A BOLT - STEEL ZINC PLATED, YELLOW PASSIVATED 

237 LINCH PINS - STEEL ZINC Plated, YELLOW PASSIVATED 

238 PARALLEL KEYS - HIGH TYPE STEEL 

CONTENTS

239 WOODRUFF KEYS - STEEL



239 TAPER KEYS with GIP HEAD - STEEL



240 BRIGHT KEY STEEL: Length 1 Meter - STEEL



240 CLEVIS PINS with SMALL HEAD and SPLIT PIN HOLE - STEEL ZINC PLATED



241 MUSHROOM HEAD RIVETS - STEEL



241 ROUND HEAD RIVETS - STEEL



242 COUNTERSUNK HEAD RIVETS - STEEL



PINS & KEYS

TAPER PINS - TURNED - STEEL



ISO	:	2339
DIN	:	18
NEN	:	10 B
ANSI	:	-
BS	:	-
NF	:	-



d1 (h10)		1	1.5	2	2.5	3	4	5
c (max)		0.15	0.23	0.3	0.4	0.45	0.6	0.75
d2	>	3	4/5	6	8	8	11	17
	≤	4	5/6	8	9	11	17	23
W (min.)		3	3.5/4	4.5	5	5	6	7.5

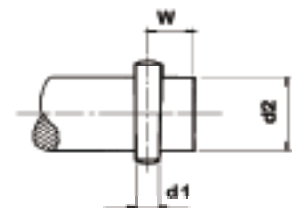
d1 (h10)		6	6.5	7	8	10	12	13	16
c (max)		0.9	1	1.2	1.2	1.5	1.8	1.8	2.5
d2	>	23	25	33	30/38	45/50	75	75	110
	≤	30	33	40	38/45	50/75	110	110	160
W (min.)		9	10	12	10/11	11.5/13	15	15	18

SIZE AVAILABLE				
d1 x L	d1 x L	d1 x L	d1 x L	d1 x L
1 x 10mm	2.5 x 30mm	5 x 20mm	7 x 50mm	10 x 150mm
1 x 14mm	2.5 x 36mm	5 x 24mm	7 x 60mm	10 x 160mm
1 x 18mm	2.5 x 40mm	5 x 30mm	7 x 70mm	
1 x 20mm	2.5 x 50mm	5 x 40mm	7 x 80mm	12 x 50mm
		5 x 50mm	7 x 100mm	12 x 60mm
1.5 x 10mm	3 x 12mm	5 x 60mm		12 x 70mm
1.5 x 14mm	3 x 14mm	5 x 70mm	8 x 40mm	12 x 80mm
1.5 x 20mm	3 x 16mm	5 x 80mm	8 x 50mm	12 x 100mm
1.5 x 24mm	3 x 20mm	5 x 100mm	8 x 60mm	12 x 120mm
1.5 x 30mm	3 x 24mm		8 x 70mm	12 x 140mm
	3 x 30mm	6 x 24mm	8 x 80mm	12 x 160mm
2 x 10mm	3 x 36mm	6 x 30mm	8 x 90mm	12 x 200mm
2 x 12mm	3 x 40mm	6 x 40mm	8 x 100mm	
2 x 14mm	3 x 50mm	6 x 50mm	8 x 120mm	13 x 100mm
2 x 18mm	3 x 60mm	6 x 60mm	8 x 140mm	13 x 150mm
2 x 20mm		6 x 70mm	8 x 160mm	
2 x 24mm	4 x 16mm	6 x 80mm		16 x 60mm
2 x 30mm	4 x 20mm	6 x 100mm	10 x 40mm	16 x 80mm
2 x 40mm	4 x 24mm	6 x 120mm	10 x 50mm	16 x 100mm
2 x 50mm	4 x 30mm	6 x 140mm	10 x 60mm	16 x 120mm
	4 x 40mm		10 x 70mm	16 x 150mm
2.5 x 12mm	4 x 50mm	6.5 x 60mm	10 x 80mm	16 x 180mm
2.5 x 16mm	4 x 60mm	6.5 x 70mm	10 x 100mm	16 x 200mm
2.5 x 20mm	4 x 70mm	6.5 x 80mm	10 x 120mm	
2.5 x 24mm	4 x 80mm	6.5 x 100mm	10 x 140mm	
2.5 x 26mm	4 x 100mm			

TECHNICAL DATA

The nominal length L does not include the rounded ends with tolerance js 15.

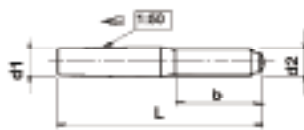
Taper pins are used to fixed two or more parts. The tapered form allows dis-assembly, and does not damage or effect the precise positioning and the passing.



Choice and position of the taper pin depends on the shaft diameter d2

PINS & KEYS

TAPER PINS with THREAD and CONSTANT THREADED PART - STEEL



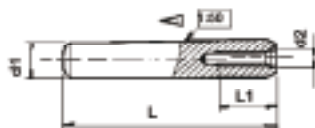
ISO	:	8737
DIN	:	7977
NEN	:	2462
ANSI	:	-
BS	:	-
NF	:	-



d1	5	6	8	10	12	16	20
d2	M5	M6	M8	M10	M12	M16	M16
b	14	18	22	24	27	35	35

SIZE AVAILABLE				
d1 x L	d1 x L	d1 x L	d1 x L	d1 x L
5 x 40mm	6 x 60mm	10 x 60mm	12 x 100mm	16 x 160mm
5 x 45mm		10 x 65mm	12 x 120mm	
5 x 50mm	8 x 55mm	10 x 75mm		20 x 100mm
	8 x 60mm	10 x 85mm	16 x 85mm	20 x 120mm
6 x 45mm	8 x 65mm	10 x 100mm	16 x 100mm	20 x 140mm
6 x 50mm	8 x 75mm		16 x 120mm	20 x 160mm
6 x 55mm		12 x 85mm	16 x 140mm	20 x 160mm

TAPER PINS with INTERNAL THREAD - GROUND - STEEL



ISO	:	8736
DIN	:	7978 A
NEN	:	2463
ANSI	:	-
BS	:	-
NF	:	-



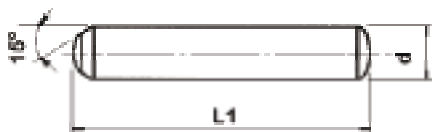
d1	6	8	10	12	16	20
d2	M4	M6	M6	M8	M10	M12
L1	6	8	10	12	16	18

SIZE AVAILABLE				
d1 x L	d1 x L	d1 x L	d1 x L	d1 x L
6 x 16mm	8 x 20mm	10 x 24mm	12 x 40mm	16 x 60mm
6 x 24mm	8 x 24mm	10 x 28mm	12 x 50mm	16 x 80mm
6 x 28mm	8 x 28mm	10 x 32mm	12 x 60mm	16 x 100mm
6 x 30mm	8 x 30mm	10 x 40mm	12 x 70mm	16 x 120mm
6 x 32mm	8 x 32mm	10 x 50mm	12 x 80mm	
6 x 40mm	8 x 40mm	10 x 60mm	12 x 100mm	20 x 60mm
6 x 50mm	8 x 50mm	10 x 70mm		20 x 80mm
6 x 60mm	8 x 60mm	10 x 80mm	16 x 40mm	20 x 100mm
	8 x 70mm		16 x 50mm	20 x 120mm
		12 x 32mm		

The nominal length L is inclusive the rounded ends with tolerance js15.

PINS & KEYS

PARALLEL PINS (DOWEL PINS) - HARDENED STEEL



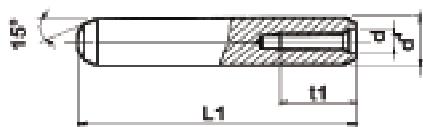
ISO	:	8737 A
DIN	:	6325
NEN	:	2282
ANSI	:	-
BS	:	-
NF	:	-



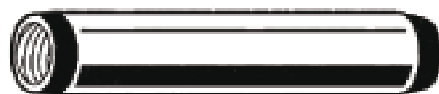
d (m6)	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16	20
--------	---	-----	---	-----	---	---	---	---	---	----	----	----	----	----

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1 x 4mm	3 x 6mm	5 x 14mm	8 x 16mm	12 x 32mm
1 x 5mm	3 x 8mm	5 x 16mm	8 x 20mm	12 x 36mm
1 x 6mm	3 x 10mm	5 x 20mm	8 x 24mm	12 x 40mm
1 x 8mm	3 x 12mm	5 x 24mm	8 x 28mm	12 x 45mm
1 x 10mm	3 x 14mm	5 x 28mm	8 x 32mm	12 x 50mm
1 x 12mm	3 x 16mm	5 x 32mm	8 x 36mm	12 x 55mm
	3 x 18mm	5 x 36mm	8 x 40mm	12 x 60mm
1.5 x 5mm	3 x 20mm	5 x 40mm	8 x 45mm	12 x 70mm
1.5 x 6mm	3 x 24mm	5 x 45mm	8 x 50mm	12 x 80mm
1.5 x 8mm	3 x 28mm	5 x 50mm	8 x 55mm	12 x 90mm
1.5 x 10mm	3 x 32mm	5 x 55mm	8 x 60mm	12 x 100mm
1.5 x 12mm	3 x 36mm	5 x 60mm	8 x 70mm	
1.5 x 14mm	3 x 40mm		8 x 80mm	14 x 40mm
1.5 x 16mm		6 x 10mm	8 x 80mm	14 x 50mm
1.5 x 20mm	4 x 6mm	6 x 12mm		14 x 60mm
1.5 x 24mm	4 x 8mm	6 x 14mm	10 x 20mm	14 x 80mm
1.5 x 28mm	4 x 10mm	6 x 16mm	10 x 24mm	14 x 100mm
1.5 x 32mm	4 x 12mm	6 x 18mm	10 x 28mm	14 x 120mm
	4 x 14mm	6 x 20mm	10 x 32mm	
2 x 5mm	4 x 16mm	6 x 24mm	10 x 36mm	16 x 40mm
2 x 6mm	4 x 20mm	6 x 28mm	10 x 40mm	16 x 50mm
2 x 8mm	4 x 24mm	6 x 32mm	10 x 45mm	16 x 60mm
2 x 10mm	4 x 28mm	6 x 36mm	10 x 50mm	16 x 80mm
2 x 12mm	4 x 32mm	6 x 40mm	10 x 55mm	16 x 100mm
2 x 14mm	4 x 36mm	6 x 45mm	10 x 60mm	16 x 120mm
2 x 16mm	4 x 40mm	6 x 50mm	10 x 70mm	
2 x 20mm	4 x 45mm	6 x 55mm	10 x 80mm	20 x 40mm
2 x 24mm	4 x 50mm	6 x 60mm	10 x 90mm	20 x 50mm
2 x 28mm		6 x 70mm	10 x 100mm	20 x 60mm
2 x 32mm	5 x 8mm	6 x 80mm		20 x 80mm
2 x 36mm	5 x 10mm		12 x 24mm	20 x 100mm
2 x 40mm	5 x 12mm	8 x 14mm	12 x 28mm	20 x 120mm

PARALLEL PINS with INTERNAL THREAD - HARDENED STEEL



ISO	:	-
DIN	:	7979 D
NEN	:	2464
ANSI	:	-
BS	:	-
NF	:	-



d (m6)	6	8	10	12	16	20
d1	M4	M5	M6	M6	M8	M10
t1	6	8	10	10	12	16

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
6 x 16mm	8 x 28mm	10 x 28mm	12 x 24mm	16 x 40mm
6 x 24mm	8 x 30mm	10 x 30mm	12 x 28mm	16 x 50mm
6 x 28mm	8 x 32mm	10 x 32mm	12 x 32mm	16 x 60mm
6 x 32mm	8 x 36mm	10 x 36mm	12 x 36mm	16 x 80mm
6 x 40mm	8 x 40mm	10 x 40mm	12 x 40mm	16 x 100mm
6 x 50mm	8 x 50mm	10 x 45mm	12 x 50mm	16 x 120mm
6 x 60mm	8 x 60mm	10 x 50mm	12 x 60mm	
	8 x 70mm	10 x 60mm	12 x 70mm	20 x 60mm
8 x 16mm		10 x 70mm	12 x 80mm	20 x 80mm
8 x 20mm	10 x 20mm	10 x 80mm	12 x 100mm	20 x 100mm
8 x 24mm	10 x 24mm			20 x 120mm

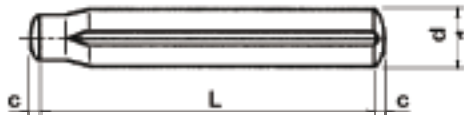
NOTE:

1- Steel hardness 60 ± 2 HRC

2- The nominal length L1 is inclusive the rounded ends with tolerance js 14 Parallel pins are mainly used as dowel pins in clamping; measuring and other tools

PINS & KEYS

GROOVE PINS, FULL LENGTH PARALLEL GROOVED with PILOT - STEEL



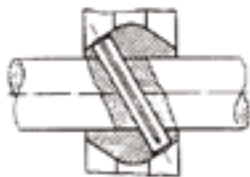
ISO	:	8739
DIN	:	1470
NEN	:	2601
ANSI	:	-
BS	:	-
NF	:	-



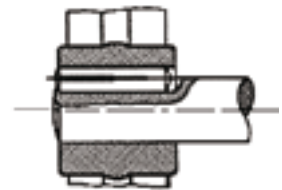
d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm		6 x 36mm	8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm		8 x 70mm

EXAMPLES OF APPLICATION



AXIAL CONNECTION OF A SHAFT



NOTE:

- 1- Free cutting steel 9 Mn Pb 28K
- 2- The nominal length L does not include the rounded ends with tolerance js 15.
Not all length L are DIN Standard.
For the hole diameter d1 with tolerance field H11 is recommended.

PINS & KEYS

GROOVE PINS, FULL LENGTH TAPER GROOVED - STEEL



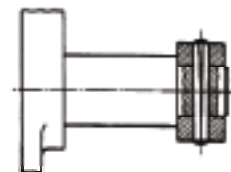
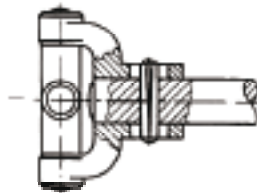
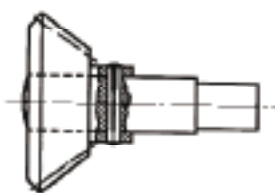
ISO	:	8744
DIN	:	1471
NEN	:	2602
ANSI	:	-
BS	:	-
NF	:	-



d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm			8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm	6 x 36mm	8 x 70mm

EXAMPLES OF APPLICATION



AS CONNECTION OF A GEAR

NOTE:

- 1- Free cutting steel 9 Mn Pb 28K
- 2- The nominal length L does not include the rounded ends with tolerance js 15.
Not all length L are DIN Standard.
For the hole diameter d1 with tolerance field H11 is recommended.

PINS & KEYS

GROOVE PINS, HALF LENGTH TAPER GROOVED - STEEL



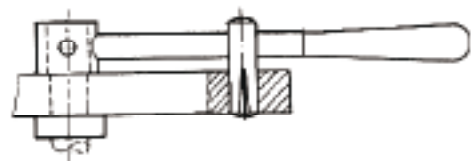
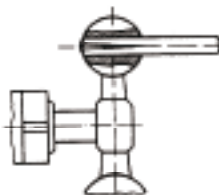
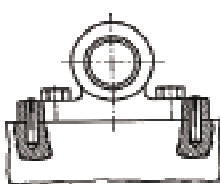
ISO	:	8745
DIN	:	1472
NEN	:	2603
ANSI	:	-
BS	:	-
NF	:	-



d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm			8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm	6 x 36mm	8 x 70mm

EXAMPLES OF APPLICATION



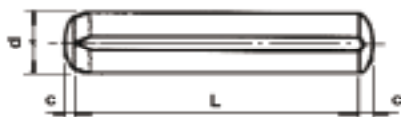
AS POSITIONING OF BEARING BLOCK

NOTE:

- 1- Free cutting steel 9 Mn Pb 28K
- 2- The nominal length L does not include the rounded ends with tolerance js 15.
Not all length L are DIN Standard.
For the hole diameter d1 with tolerance field H11 is recommended.

PINS & KEYS

GROOVE PINS, FULL LENGTH PARALLEL GROOVED with CHAMFER - STEEL



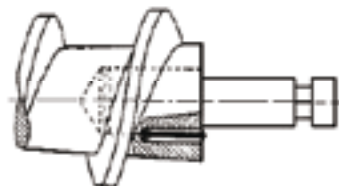
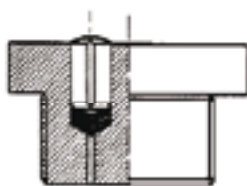
ISO	:	8740
DIN	:	1473
NEN	:	2604
ANSI	:	-
BS	:	-
NF	:	-



d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm			8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm	6 x 36mm	8 x 70mm

EXAMPLES OF APPLICATION



NOTE:

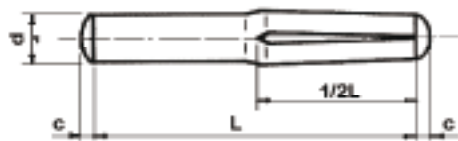
1- Free cutting steel 9 Mn Pb 28K

2- The nominal length L does not include the rounded ends with tolerance js 15.

For the hole diameter d1 with tolerance field H11 is recommended.

PINS & KEYS

GROOVE PINS, HALF LENGTH REVERSE GROOVED - STEEL



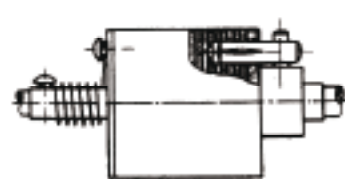
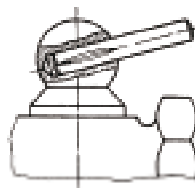
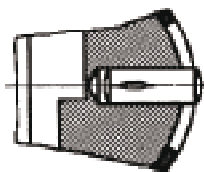
ISO	:	8741
DIN	:	1474
NEN	:	2605
ANSI	:	-
BS	:	-
NF	:	-



d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm			8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm	6 x 36mm	8 x 70mm

EXAMPLES OF APPLICATION



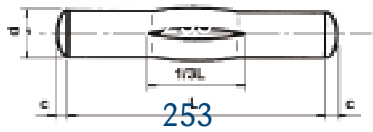
NOTE:

- 1- Free cutting steel 9 Mn Pb 28K
- 2- The nominal length L does not include the rounded ends with tolerance js 15.
For the hole diameter d1 with tolerance field H11 is recommended.
Not all lengths L are DIN standard.

PINS & KEYS

GROOVE PINS, THIRD LENGTH CENTER GROOVED - STEEL

252



ISO	:	8742
DIN	:	1475
NEN	:	2606
ANSI	:	-
BS	:	-
NF	:	-

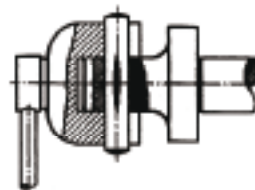
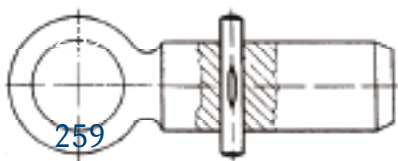


d1	1.5	2	2.5	3	4	5	6	8
Tol. Field	h9	h9	h9	h9	h11	h11	h11	h11
C =	0.2	0.25	0.3	0.4	0.5	0.6	0.8	1
Shear load double shear min. in Kn	1.60	2.85	4.25	6.15	10.6	16.5	22.8	40.5

SIZE AVAILABLE				
d x L1 2	d x L1 2	d x L1 2	d x L1 2	d x L1 2
1.5 x 4mm	2 x 24mm	3 x 16mm	5 x 12mm	6 x 40mm
1.5 x 5mm	2 x 30mm	3 x 20mm	5 x 16mm	6 x 45mm
1.5 x 6mm		3 x 24mm	5 x 20mm	6 x 50mm
1.5 x 8mm	2.5 x 6mm	3 x 30mm	5 x 24mm	6 x 60mm
1.5 x 10mm	2.5 x 8mm		5 x 30mm	
1.5 x 12mm	2.5 x 10mm	4 x 8mm	5 x 36mm	8 x 12mm
1.5 x 16mm	2.5 x 12mm	4 x 10mm	5 x 40mm	8 x 16mm
1.5 x 20mm	2.5 x 16mm	4 x 12mm		8 x 20mm
	2.5 x 20mm	4 x 16mm	6 x 10mm	8 x 24mm
2 x 5mm	2.5 x 24mm	4 x 20mm	6 x 12mm	8 x 30mm
2 x 6mm	2.5 x 30mm	4 x 24mm	6 x 16mm	8 x 36mm
2 x 8mm		4 x 30mm	6 x 20mm	8 x 40mm
2 x 10mm	3 x 6mm	4 x 36mm	6 x 24mm	8 x 45mm
2 x 12mm	3 x 8mm	4 x 40mm	6 x 30mm	8 x 50mm
2 x 16mm	3 x 10mm			8 x 60mm
2 x 20mm	3 x 12mm	5 x 10mm	6 x 36mm	8 x 70mm

EXAMPLES OF APPLICATION

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NOTE:

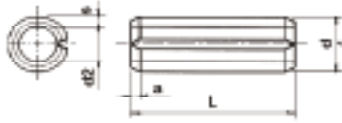
- 1- Free cutting steel 9 Mn Pb 28K
- 2- The nominal length L do not include the rounded ends with tolerance js 15.
For the hole diameter d1 with tolerance field H11 is recommended.
Not all lengths L are DIN standard.

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PINS & KEYS

SPRING TYPE STRAIGHT PINS SLOTTED - HEAVY TYPE STEEL and STEEL ZINC PLATED



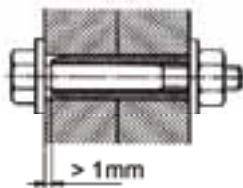
ISO	:	8752
DIN	:	1481
NEN	:	2458
ANSI	:	-
BS	:	7060
NF	:	-



d (nom.)		1.5	2	2.5	3	4	5	6	7	8	9	10	12	14	16	18	20
d1	min.	1.7	2.3	2.8	3.3	4.4	5.4	6.4	7.5	8.5	9.5	10.5	12.5	14.4	16.5	18.5	20.5
	max.	1.8	2.4	2.9	3.5	4.6	5.6	6.7	7.8	8.8	9.8	10.8	12.8	14.8	16.8	18.9	20.9
d2 =		1.1	1.5	1.8	2.1	2.8	3.4	3.9	4.5	5.5	5.5	6.5	7.5	8.5	10.5	11.5	12.5
s		0.3	0.4	0.5	0.6	0.8	1	1.25	1.5	1.5	2	2	2.5	3	3	3.5	4
a 2		0.25	0.35	0.4	0.5	0.65	0.9	1.2	2	2	2	2	2	2	2	2	3
Shear load double shear min. in Kn	single shear	0.79	1.41	2.19	3.16	5.62	8.77	13.02	15.7	21.38	30.33	35.08	52.07	72.36	85.51	111.27	140.32
	double shear	1.58	2.82	4.38	6.32	11.24	17.54	26.04	31.4	42.76	60.66	70.16	104.1	144.7	171	222.5	280.6

SIZE AVAILABLE					
d x L	d x L	d x L	d x L	d x L	d x L
1.5 x 6mm	3 x 24mm	5 x 30mm	8 x 30mm	10 x 120mm	16 x 70mm
1.5 x 8mm	3 x 26mm	5 x 32mm	8 x 32mm	10 x 140mm	16 x 80mm
1.5 x 10mm	3 x 28mm	5 x 40mm	8 x 36mm	10 x 160mm	16 x 100mm
1.5 x 12mm		5 x 45mm	8 x 40mm		16 x 120mm
1.5 x 16mm	3 x 30mm		8 x 50mm	12 x 30mm	
1.5 x 20mm	3 x 36mm	5 x 50mm	8 x 60mm	12 x 36mm	18 x 40mm
	3 x 40mm	5 x 60mm	8 x 70mm	12 x 40mm	18 x 50mm
2 x 10mm	3 x 50mm	5 x 70mm	8 x 80mm	12 x 50mm	18 x 60mm
2 x 12mm		5 x 80mm	8 x 100mm	12 x 60mm	18 x 70mm
2 x 16mm	4 x 8mm		8 x 120mm	12 x 70mm	18 x 80mm
2 x 20mm	4 x 10mm	6 x 10mm		12 x 80mm	18 x 85mm
2 x 24mm	4 x 14mm	6 x 16mm	9 x 30mm	12 x 100mm	18 x 90mm
2 x 26mm	4 x 16mm	6 x 24mm	9 x 40mm	12 x 120mm	18 x 95mm
2 x 30mm	4 x 20mm	6 x 26mm	9 x 50mm	12 x 140mm	18 x 100mm
2 x 40mm	4 x 24mm	6 x 30mm	9 x 60mm		18 x 120mm
	4 x 26mm	6 x 40mm	9 x 70mm	14 x 30mm	
2.5 x 12mm	4 x 30mm	6 x 50mm	9 x 80mm	14 x 36mm	20 x 40mm
2.5 x 16mm	4 x 32mm	6 x 60mm	9 x 100mm	14 x 40mm	20 x 50mm
2.5 x 18mm	4 x 36mm	6 x 70mm	9 x 120mm	14 x 50mm	20 x 60mm
2.5 x 20mm	4 x 40mm	6 x 80mm		14 x 60mm	20 x 70mm
2.5 x 24mm	4 x 50mm	6 x 100mm	10 x 20mm	14 x 70mm	20 x 80mm
2.5 x 26mm	4 x 60mm		10 x 30mm	14 x 80mm	20 x 85mm
2.5 x 28mm		7 x 26mm	10 x 40mm	14 x 100mm	20 x 95mm
2.5 x 30mm	5 x 8mm	7 x 30mm	10 x 50mm	14 x 120mm	20 x 100mm
	5 x 16mm	7 x 40mm	10 x 60mm		20 x 105mm
3 x 10mm	5 x 18mm	7 x 50mm	10 x 70mm	16 x 30mm	20 x 110mm
3 x 12mm	5 x 20mm	7 x 60mm	10 x 75mm	16 x 36mm	20 x 115mm
3 x 14mm	5 x 24mm	7 x 70mm	10 x 80mm	16 x 40mm	20 x 120mm
3 x 16mm	5 x 26mm	7 x 80mm	10 x 90mm	16 x 50mm	
3 x 20mm	5 x 28mm	7 x 100mm	10 x 100mm	16 x 60mm	

EXAMPLES OF APPLICATION



d nom. Spring type straight pin	6	8	10	12	16	18
intended for boltsize	M3	M4	M5	M6	M8	M10
associated washer DIN 7349	3.2	4.3	5.3	6.4	8.4	10.5

NOTE:

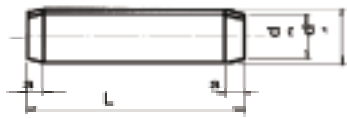
1- Spring steel 55 Si 7

2- These spring type slotted pins have bevelled edges of 30° on both sides for sizes up to and including 6mm pins over 8mm have a single bevelled edge of 15° For the drilling hole d nom. With tolerance H12 is recommended.

Warning; electro-galvanising of these products may cause hydrogen embrittlement Not all lengths L are DIN standard.

PINS & KEYS

SPIROL PINS MEDIUM DUTY - STEEL



ISO : 8750
DIN : 7343
NEN : 2553
ANSI : -
BS : -
NF : -



d	(nom.)	1	1.5	2	2.5	3	4	5	6	8	10	12	14	16
d1	min.	1.05	1.62	2.13	2.65	3.15	4.2	5.25	6.25	8.3	10.35	12.4	14.45	16.45
	max.	1.15	1.73	2.25	2.78	3.3	4.4	5.5	6.5	8.63	10.8	12.65	14.95	17
d2	max.	0.95	1.4	1.9	2.4	2.9	3.9	4.85	5.85	7.8	9.75	11.7	13.6	15.6
a =		0.3	0.5	0.7	0.7	0.9	1.1	1.3	1.5	2	2.5	3	3.5	4
Shear load double shear min. in Kn		0.6	1.45	2.5	3.9	5.5	9.6	15	22	39	62	89	120	155

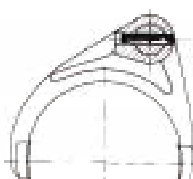
SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
1 x 4mm	3 x 20mm	5 x 26mm	8 x 50mm	12 x 60mm
1 x 6mm	3 x 22mm	5 x 28mm	8 x 60mm	12 x 70mm
1 x 8mm	3 x 24mm	5 x 30mm	8 x 70mm	12 x 80mm
1 x 10mm	3 x 26mm	5 x 32mm	8 x 80mm	12 x 85mm
1 x 12mm	3 x 28mm	5 x 35mm	8 x 90mm	12 x 90mm
	3 x 30mm	5 x 40mm	8 x 100mm	12 x 100mm
	3 x 32mm	5 x 45mm	8 x 120mm	12 x 120mm
1.5 x 4mm		5 x 50mm		12 x 140mm
1.5 x 6mm		5 x 60mm		12 x 160mm
1.5 x 8mm	4 x 10mm		10 x 20mm	
1.5 x 10mm	4 x 12mm		10 x 22mm	
1.5 x 12mm	4 x 16mm	6 x 12mm	10 x 24mm	14 x 50mm
1.5 x 14mm	4 x 18mm	6 x 16mm	10 x 28mm	14 x 60mm
1.5 x 16mm	4 x 20mm	6 x 20mm	10 x 30mm	14 x 70mm
1.5 x 20mm	4 x 22mm	6 x 24mm	10 x 35mm	14 x 80mm
	4 x 24mm	6 x 26mm	10 x 38mm	14 x 90mm
2.5 x 8mm	4 x 26mm	6 x 30mm	10 x 40mm	14 x 100mm
2.5 x 10mm	4 x 28mm	6 x 32mm	10 x 50mm	
2.5 x 12mm	4 x 30mm	6 x 35mm	10 x 60mm	16 x 40mm
2.5 x 14mm	4 x 32mm	6 x 40mm	10 x 70mm	16 x 56mm
2.5 x 16mm	4 x 35mm	6 x 50mm	10 x 80mm	16 x 60mm
2.5 x 18mm	4 x 40mm	6 x 60mm	10 x 90mm	16 x 70mm
2.5 x 20mm	4 x 50mm	6 x 70mm	10 x 100mm	16 x 80mm
2.5 x 24mm			10 x 120mm	16 x 90mm
	5 x 10mm	8 x 20mm		16 x 100mm
3 x 8mm	5 x 12mm	8 x 24mm	12 x 24mm	16 x 120mm
3 x 10mm	5 x 16mm	8 x 30mm	12 x 30mm	16 x 140mm
3 x 12mm	5 x 20mm	8 x 32mm	12 x 35mm	16 x 160mm
3 x 14mm	5 x 22mm	8 x 35mm	12 x 40mm	16 x 180mm
3 x 16mm	5 x 24mm	8 x 40mm	12 x 50mm	

TECHNICAL DATA

- Spirol pins are used for the dismantable connection (positioning) of two or more parts and can also be applied as shafts and hinge stop or carrier pins.
- Due to the spiral shaped cross section (approx. 2 / 4 coils) the spirol pins are very flexible and suitable to be used more times for dynamic load. Equal stress distribution throughout its cross section against the hole wall produces a good press fit, which can absorb shear forces affected by the direction.
- Both ends are conically chamfered, so they can easily be inserted and installed automatically.



clamping tool for furniture industry



Change fork for automotive transmission



Universal joint for socket wrench



Hinge connection for plastic powder box

PINS & KEYS

SPIROL PINS HEAVY DUTY - STEEL



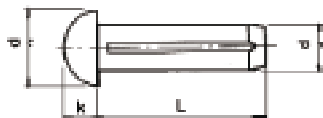
ISO	:	8748
DIN	:	7344
NEN	:	2554
ANSI	:	-
BS	:	-
NF	:	-



d	(nom.)	1.5	2	2.5	3	4	5	6
d1	min.	1.61	2.11	2.62	3.12	4.15	5.15	6.18
	max.	1.71	2.21	2.73	3.25	4.3	5.35	6.4
d2	max.	1.4	1.9	2.4	2.9	3.9	4.85	5.85
a =		0.5	0.7	0.7	0.9	1.1	1.3	1.5
Shear load double shear min. in Kn		1.9	3.5	5.5	7.6	13.5	20	30

SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
1.5 x 4mm	2 x 20mm	3 x 14mm	4 x 28mm	5 x 35mm
1.5 x 5mm	2 x 22mm	3 x 16mm	4 x 30mm	5 x 40mm
1.5 x 6mm	2 x 24mm	3 x 20mm	4 x 32mm	5 x 45mm
1.5 x 8mm		3 x 22mm	4 x 35mm	5 x 50mm
1.5 x 10mm	2.5 x 6mm	3 x 24mm	4 x 36mm	
1.5 x 12mm	2.5 x 8mm	3 x 26mm	4 x 40mm	6 x 14mm
1.5 x 14mm	2.5 x 10mm	3 x 28mm		6 x 16mm
1.5 x 16mm	2.5 x 12mm	3 x 30mm	5 x 12mm	6 x 18mm
	2.5 x 14mm	3 x 32mm	5 x 14mm	6 x 20mm
2 x 6mm	2.5 x 16mm		5 x 16mm	6 x 22mm
2 x 8mm	2.5 x 18mm	4 x 10mm	5 x 18mm	6 x 24mm
2 x 10mm	2.5 x 20mm	4 x 12mm	5 x 20mm	6 x 26mm
2 x 12mm	2.5 x 22mm	4 x 16mm	5 x 22mm	6 x 28mm
2 x 14mm	2.5 x 24mm	4 x 18mm	5 x 24mm	6 x 30mm
2 x 16mm		4 x 20mm	5 x 26mm	6 x 32mm
2 x 16mm	3 x 8mm	4 x 22mm	5 x 28mm	6 x 35mm
2 x 18mm	3 x 10mm	4 x 24mm	5 x 30mm	6 x 40mm
	3 x 12mm	4 x 26mm	5 x 32mm	6 x 50mm

ROUND HEAD GROOVED PINS - STEEL



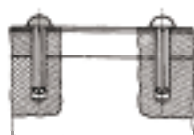
ISO	:	8746
DIN	:	1476
NEN	:	2460
ANSI	:	-
BS	:	-
NF	:	-



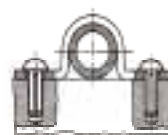
d	1.4	1.7	2	2.6	3	4	5	6
Tolerance	0/-0.05	0/-0.05	0/-0.05	0/0.075	0/0.075	0/-0.1	0/-0.1	0/-0.1
d2	2.4	3	3.5	4.5	5.2	7	8.8	10.5
k	0.8	1	1.2	1.6	1.8	2.4	3	3.6

SIZE AVAILABLE				
d x L	d x L	d x L	d x L	d x L
1.4 x 3mm	2 x 3mm	2.6 x 6mm	3 x 15mm	5 x 12mm
1.4 x 4mm	2 x 4mm	2.6 x 8mm		5 x 15mm
1.4 x 5mm	2 x 5mm	2.6 x 10mm	4 x 6mm	5 x 20mm
1.4 x 6mm	2 x 6mm		4 x 8mm	5 x 25mm
	2 x 8mm	3 x 4mm	4 x 10mm	
1.7 x 3mm	2 x 10mm	3 x 5mm	4 x 12mm	6 x 10mm
1.7 x 4mm		3 x 6mm	4 x 15mm	6 x 12mm
1.7 x 5mm	2.6 x 3mm	3 x 8mm		6 x 15mm
1.7 x 6mm	2.6 x 4mm	3 x 10mm	5 x 8mm	6 x 20mm
	2.6 x 5mm	3 x 12mm	5 x 10mm	6 x 25mm

EXAMPLES OF APPLICATION



for connection of the sheet



for connection of pipe clips

The size is not DIN standardized
The nominal length is with tolerance js15

PINS & KEYS

SPLIT PINS (Cotter Pins) - STEEL, STEEL ZINC Plated and YELLOW PASSIVATED



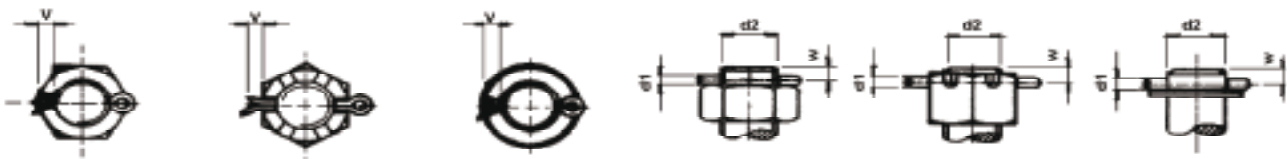
ISO : 1234
DIN : 94
NEN : 182
ANSI : -
BS : 1574
NF : -



d	(nom.)	1	1.6	2	2.5	3.2	3.5	4	4.5	5	6.3	7	8	10	13
d1	min.	0.9	1.4	1.8	2.3	2.9	3.2	3.7	4.2	4.6	5.9	6.5	7.5	9.5	12.4
	max.	0.8	1.3	1.7	2.1	2.7	3	3.5	4	4.4	5.7	6.7	7.3	9.3	12.1
a	max.	1.6	2.5	2.5	2.5	3.2	3.5	4	4	4	4	4.7	4	6.3	6.3
b =		3	3.2	4	5	6.4	7	8	8.5	10	12.6	12.3	16	20	26
c	min.	1.6	2.4	3.2	4	5.1	6.1	6.5	7.6	8	10.3	12.45	13.1	16.6	21.7
	max.	1.8	2.8	3.6	4.6	5.8	6.8	7.4	8.2	9.2	11.8	12.5	15	19	24.8

SIZE AVAILABLE				
d x L (js 17)	d x L (js 17)	d x L (js 17)	d x L (js 17)	d x L (js 17)
1 x 10mm	2.5 x 25mm	3.5 x 70mm	5 x 63mm	8 x 71mm
1 x 12mm	2.5 x 32mm	3.5 x 80mm	5 x 80mm	8 x 80mm
1 x 16mm	2.5 x 40mm		5 x 100mm	8 x 90mm
1 x 20mm	2.5 x 50mm	4 x 20mm		8 x 100mm
1 x 25mm	2.5 x 63mm	4 x 25mm	6.3 x 25mm	8 x 125mm
1 x 32mm		4 x 28mm	6.3 x 32mm	
1 x 40mm	3.2 x 16mm	4 x 32mm	6.3 x 40mm	10 x 56mm
1 x 50mm	3.2 x 20mm	4 x 40mm	6.3 x 45mm	10 x 63mm
	3.2 x 25mm	4 x 50mm	6.3 x 50mm	10 x 71mm
1.6 x 10mm	3.2 x 32mm	4 x 63mm	6.3 x 63mm	10 x 80mm
1.6 x 12mm	3.2 x 40mm	4 x 80mm	6.3 x 71mm	10 x 90mm
1.6 x 16mm	3.2 x 50mm		6.3 x 80mm	10 x 100mm
1.6 x 20mm	3.2 x 63mm	4.5 x 50mm	6.3 x 100mm	10 x 112mm
1.6 x 25mm		4.5 x 63mm		10 x 125mm
1.6 x 32mm	3.5 x 20mm		7 x 63mm	10 x 160mm
1.6 x 40mm	3.5 x 25mm	5 x 25mm	7 x 80mm	
1.6 x 50mm	3.5 x 30mm	5 x 32mm		13 x 63mm
1.6 x 63mm	3.5 x 35mm	5 x 36mm	8 x 40mm	13 x 80mm
	3.5 x 40mm	5 x 40mm	8 x 45mm	13 x 100mm
2.5 x 16mm	3.5 x 50mm	5 x 45mm	8 x 50mm	13 x 125mm
2.5 x 20mm	3.5 x 60mm	5 x 50mm	8 x 63mm	13 x 160mm

TECHNICAL DATA / TABLE - CHOICE OF SPLIT PINS



d (nom.)			1	1.6	2	2.5	3.2	4	5	6.3	8	10	13
d2	parts with thread	above	3.5	5.5	7	9	11	14	20	27	39	56	80
		up to incl.	4.5	7	9	11	14	20	27	39	56	80	120
	parts without thread	above	3	5	6	8	9	12	17	23	29	44	69
		up to incl.	4	6	8	9	12	17	23	29	44	69	110
v		mjn.	4	5	6	6	8	8	10	12	14	16	20

1- For application in parts with external thread the major diameter of the thread or the diameter of the plain part has to be used.

2- For railways and constructions subjected to alternating transverse forces, it is recommended to use the following larger split pin size.

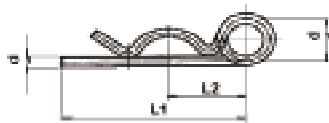
The hole distance W depends on the construction part in which the split pin is inserted. if necessary see the standard of the particular parts.

NOTE:

For Heavy Duty Yellow Passivated - available at d (nom. size) 2, 3.2, 4 and 5.

PINS & KEYS

SPRING COTTERS OF A BOLT - STEEL ZINC PLATED, YELLOW PASSIVATED



ISO	:	-
DIN	:	11024
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d (nom.)		2.5	3.5	3.5	4.5	4.5	5.5	6	6.5	7	8	9
Coil		single	single	double	single	double	double	single	double	single	single	single
For shaft Ø d2	>	9	10	14	16	17	18	20	24	28	28	30
	≤	14	16	20	20	24	30	28	36	40	45	45
d3		2	3	3	4	4	5	5	6	6	7	8
d4		10	18	16	20	23	26	24	30	30	30	28
L1		50	60	62	60	78	92	85	120	105	105	110
L2		25	28	32	30	44	50	40	70	50	50	55

SIZE AVAILABLE		
d1 (=d3) Single	d1 (=d3) Single	d1 (=d3) Single
2.5 (=2mm)	6 (=5mm)	8 (=7mm)
3.5 (=3mm)	7 (=6mm)	9 (=8mm)
4.5 (=4mm)		
d1 (=d3) Double	d1 (=d3) Double	d1 (=d3) Double
3.5 (=3mm)	5.5 (=5mm)	6.5 (=6mm)
4.5 (=4mm)		

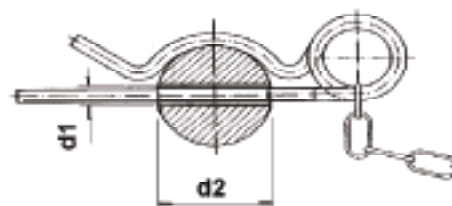
TYPES / ASSEMBLY DATA



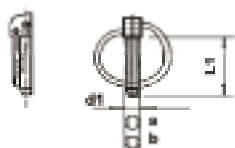
SINGLE



DOUBLE



LINCH PINS - STEEL ZINC Plated, YELLOW PASSIVATEDa



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d (nom.)	4.5	6	7	8	9.5	10	11
L1	40	40	40	40	40	40	40
Form of shaft	a	a	b	b	b	b	b
d3 (H11)	5	6.2	8	8.5	10	10.5	12
d4 (max)	25	32	32	32	32	32	32
L2	8	10	12	12	14	14	14

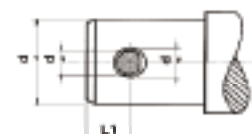
SIZE AVAILABLE		
d1	d1	d1
4.5mm	8mm	10mm
6mm	9.5mm	11mm
7mm		

ASSEMBLY DATA

1- Spring steel

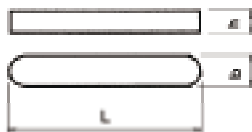
2- Form of shaft a = round, b = flattened on one side.

WARNING: Electro galvanizing of these products may cause hydrogen embrittlement.



PINS & KEYS

PARALLEL KEYS - HIGH TYPE STEEL



ISO : R773
DIN : 6885 A
NEN : 2462
ANSI : -
BS : 4235-1
NF : -



b		2	3	4	5	6	8	10	12	14	16	18	20	22
h		2	3	4	5	6	7	8	8	9	10	11	12	14
For shaft Ø	>	6	8	10	12	17	22	30	38	44	50	58	65	75
	≤	8	10	12	17	22	30	38	44	50	58	65	75	85

b		25	28	32	36	40	45	50
h		14	16	18	20	22	25	28
For shaft Ø	>	85	95	110	130	150	170	200
	≤	95	110	130	150	170	200	230

SIZE AVAILABLE							
b x h x L	b x h x L	b x h x L	b x h x L	b x h x L	b x h x L	b x h x L	b x h x L
2 x 2 x 6mm	5 x 5 x 10mm	8 x 7 x 16mm	10 x 8 x 90mm	14 x 9 x 75mm	20 x 12 x 45mm	28 x 16 x 63mm	40 x 22 x 80mm
2 x 2 x 8mm	5 x 5 x 12mm	8 x 7 x 18mm	10 x 8 x 100mm	14 x 9 x 80mm	20 x 12 x 50mm	28 x 16 x 70mm	40 x 22 x 90mm
2 x 2 x 10mm	5 x 5 x 14mm	8 x 7 x 20mm	10 x 8 x 110mm	14 x 9 x 85mm	20 x 12 x 50mm	28 x 16 x 80mm	40 x 22 x 100mm
2 x 2 x 12mm	5 x 5 x 15mm	8 x 7 x 22mm	10 x 8 x 120mm	14 x 9 x 90mm	20 x 12 x 56mm	28 x 16 x 90mm	40 x 22 x 110mm
2 x 2 x 14mm	5 x 5 x 16mm	8 x 7 x 25mm	10 x 8 x 125mm	14 x 9 x 100mm	20 x 12 x 60mm	28 x 16 x 100mm	40 x 22 x 125mm
2 x 2 x 16mm	5 x 5 x 18mm	8 x 7 x 28mm	10 x 8 x 140mm	14 x 9 x 110mm	20 x 12 x 63mm	28 x 16 x 110mm	40 x 22 x 140mm
2 x 2 x 18mm	5 x 5 x 20mm	8 x 7 x 30mm	10 x 8 x 160mm	14 x 9 x 120mm	20 x 12 x 70mm	28 x 16 x 125mm	40 x 22 x 160mm
2 x 2 x 20mm	5 x 5 x 22mm	8 x 7 x 32mm	10 x 8 x 180mm	14 x 9 x 125mm	20 x 12 x 80mm	28 x 16 x 140mm	40 x 22 x 180mm
2 x 2 x 22mm	5 x 5 x 25mm	8 x 7 x 35mm		14 x 9 x 140mm	20 x 12 x 90mm	28 x 16 x 160mm	40 x 22 x 200mm
2 x 2 x 25mm	5 x 5 x 28mm	8 x 7 x 36mm	12 x 8 x 20mm	14 x 9 x 160mm	20 x 12 x 100mm	28 x 16 x 180mm	40 x 22 x 220mm
2 x 2 x 28mm	5 x 5 x 30mm	8 x 7 x 40mm	12 x 8 x 22mm	14 x 9 x 180mm	20 x 12 x 110mm	28 x 16 x 200mm	40 x 22 x 250mm
2 x 2 x 30mm	5 x 5 x 32mm	8 x 7 x 45mm	12 x 8 x 25mm		20 x 12 x 120mm	28 x 16 x 220mm	40 x 22 x 280mm
2 x 2 x 32mm	5 x 5 x 35mm	8 x 7 x 50mm	12 x 8 x 28mm	16 x 10 x 30mm	20 x 12 x 125mm	28 x 16 x 250mm	40 x 22 x 320mm
2 x 2 x 36mm	5 x 5 x 36mm	8 x 7 x 55mm	12 x 8 x 30mm	16 x 10 x 32mm	20 x 12 x 140mm	28 x 16 x 320mm	40 x 22 x 360mm
2 x 2 x 40mm	5 x 5 x 40mm	8 x 7 x 60mm	12 x 8 x 32mm	16 x 10 x 36mm	20 x 12 x 160mm		40 x 22 x 400mm
	5 x 5 x 45mm	8 x 7 x 63mm	12 x 8 x 35mm	16 x 10 x 40mm	20 x 12 x 180mm	32 x 18 x 70mm	
3 x 3 x 6mm	5 x 5 x 50mm	8 x 7 x 65mm	12 x 8 x 40mm	16 x 10 x 45mm	20 x 12 x 200mm	32 x 18 x 80mm	45 x 25 x 100mm
3 x 3 x 8mm	5 x 5 x 55mm	8 x 7 x 70mm	12 x 8 x 45mm	16 x 10 x 50mm	20 x 12 x 220mm	32 x 18 x 90mm	45 x 25 x 110mm
3 x 3 x 10mm	5 x 5 x 56mm	8 x 7 x 75mm	12 x 8 x 50mm	16 x 10 x 56mm		32 x 18 x 100mm	45 x 25 x 125mm
3 x 3 x 12mm	5 x 5 x 60mm	8 x 7 x 80mm	12 x 8 x 55mm	16 x 10 x 60mm	22 x 14 x 50mm	32 x 18 x 110mm	45 x 25 x 140mm
3 x 3 x 15mm	5 x 5 x 63mm	8 x 7 x 85mm	12 x 8 x 56mm	16 x 10 x 63mm	22 x 14 x 56mm	32 x 18 x 125mm	45 x 25 x 160mm
3 x 3 x 16mm	5 x 5 x 70mm	8 x 7 x 90mm	12 x 8 x 60mm	16 x 10 x 70mm	22 x 14 x 60mm	32 x 18 x 140mm	45 x 25 x 180mm
3 x 3 x 18mm		8 x 7 x 100mm	12 x 8 x 63mm	16 x 10 x 80mm	22 x 14 x 63mm	32 x 18 x 160mm	45 x 25 x 200mm
3 x 3 x 20mm	6 x 6 x 10mm	8 x 7 x 110mm	12 x 8 x 65mm	16 x 10 x 90mm	22 x 14 x 70mm	32 x 18 x 180mm	45 x 25 x 220mm
3 x 3 x 22mm	6 x 6 x 12mm	8 x 7 x 120mm	12 x 8 x 70mm	16 x 10 x 100mm	22 x 14 x 80mm	32 x 18 x 200mm	45 x 25 x 250mm
3 x 3 x 25mm	6 x 6 x 14mm	8 x 7 x 125mm	12 x 8 x 75mm	16 x 10 x 110mm	22 x 14 x 90mm	32 x 18 x 220mm	45 x 25 x 280mm
3 x 3 x 28mm	6 x 6 x 15mm	8 x 7 x 140mm	12 x 8 x 80mm	16 x 10 x 120mm	22 x 14 x 100mm	32 x 18 x 250mm	45 x 25 x 320mm
3 x 3 x 30mm	6 x 6 x 16mm	8 x 7 x 160mm	12 x 8 x 85mm	16 x 10 x 125mm	22 x 14 x 110mm	32 x 18 x 280mm	45 x 25 x 360mm
3 x 3 x 32mm	6 x 6 x 18mm	8 x 7 x 180mm	12 x 8 x 90mm	16 x 10 x 140mm	22 x 14 x 120mm	32 x 18 x 320mm	45 x 25 x 400mm
3 x 3 x 35mm	6 x 6 x 20mm		12 x 8 x 100mm	16 x 10 x 160mm	22 x 14 x 125mm	32 x 18 x 360mm	
3 x 3 x 36mm	6 x 6 x 22mm	10 x 8 x 16mm	12 x 8 x 110mm	16 x 10 x 180mm	22 x 14 x 140mm		50 x 28 x 125mm
3 x 3 x 40mm	6 x 6 x 25mm	10 x 8 x 18mm	12 x 8 x 120mm	16 x 10 x 200mm	22 x 14 x 160mm	36 x 20 x 80mm	50 x 28 x 140mm
	6 x 6 x 28mm	10 x 8 x 20mm	12 x 8 x 125mm		22 x 14 x 180mm	36 x 20 x 90mm	50 x 28 x 160mm
4 x 4 x 6mm	6 x 6 x 30mm	10 x 8 x 22mm	12 x 8 x 140mm	18 x 11 x 40mm	22 x 14 x 200mm	36 x 20 x 100mm	50 x 28 x 180mm
4 x 4 x 8mm	6 x 6 x 32mm	10 x 8 x 25mm	12 x 8 x 160mm	18 x 11 x 45mm	22 x 14 x 220mm	36 x 20 x 110mm	50 x 28 x 200mm
4 x 4 x 10mm	6 x 6 x 35mm	10 x 8 x 28mm	12 x 8 x 180mm	18 x 11 x 50mm	22 x 14 x 250mm	36 x 20 x 120mm	50 x 28 x 220mm
4 x 4 x 12mm	6 x 6 x 36mm	10 x 8 x 30mm		18 x 11 x 56mm		36 x 20 x 125mm	50 x 28 x 250mm
4 x 4 x 14mm	6 x 6 x 40mm	10 x 8 x 32mm	14 x 9 x 25mm	18 x 11 x 60mm	25 x 14 x 63mm	36 x 20 x 140mm	50 x 28 x 280mm
4 x 4 x 15mm	6 x 6 x 45mm	10 x 8 x 35mm	14 x 9 x 28mm	18 x 11 x 63mm	25 x 14 x 70mm	36 x 20 x 160mm	50 x 28 x 320mm
4 x 4 x 16mm	6 x 6 x 50mm	10 x 8 x 36mm	14 x 9 x 30mm	18 x 11 x 70mm	25 x 14 x 80mm	36 x 20 x 180mm	50 x 28 x 360mm
4 x 4 x 18mm	6 x 6 x 55mm	10 x 8 x 40mm	14 x 9 x 32mm	18 x 11 x 80mm	25 x 14 x 90mm	36 x 20 x 200mm	50 x 28 x 400mm
4 x 4 x 20mm	6 x 6 x 56mm	10 x 8 x 45mm	14 x 9 x 35mm	18 x 11 x 90mm	25 x 14 x 100mm	36 x 20 x 220mm	
4 x 4 x 22mm	6 x 6 x 60mm	10 x 8 x 50mm	14 x 9 x 36mm	18 x 11 x 100mm	25 x 14 x 110mm	36 x 20 x 250mm	
4 x 4 x 25mm	6 x 6 x 63mm	10 x 8 x 55mm	14 x 9 x 40mm	18 x 11 x 110mm	25 x 14 x 120mm	36 x 20 x 280mm	
4 x 4 x 28mm	6 x 6 x 65mm	10 x 8 x 56mm	14 x 9 x 45mm	18 x 11 x 120mm	25 x 14 x 125mm	36 x 20 x 320mm	
4 x 4 x 30mm	6 x 6 x 70mm	10 x 8 x 60mm	14 x 9 x 50mm	18 x 11 x 125mm	25 x 14 x 140mm	36 x 20 x 360mm	
4 x 4 x 32mm	6 x 6 x 75mm	10 x 8 x 63mm	14 x 9 x 55mm	18 x 11 x 140mm	25 x 14 x 160mm	36 x 20 x 400mm	
4 x 4 x 35mm	6 x 6 x 80mm	10 x 8 x 65mm	14 x 9 x 56mm	18 x 11 x 160mm	25 x 14 x 180mm		
4 x 4 x 36mm		10 x 8 x 70mm	14 x 9 x 60mm	18 x 11 x 180mm	25 x 14 x 200mm		
4 x 4 x 40mm	8 x 7 x 10mm	10 x 8 x 75mm	14 x 9 x 63mm	18 x 11 x 200mm	25 x 14 x 220mm		
4 x 4 x 45mm	8 x 7 x 12mm	10 x 8 x 80mm	14 x 9 x 65mm		25 x 14 x 250mm		
4 x 4 x 50mm	8 x 7 x 15mm	10 x 8 x 85mm	14 x 9 x 70mm	20 x 12 x 40mm	25 x 14 x 280mm		

PINS & KEYS

WOODRUFF KEYS - STEEL



ISO : 3912
DIN : 6888
NEN : -
ANSI : -
BS : 4235-2
NF : -



b (h9)	2	2	2 2	2.5	3	3	3 2	3	4	4	4
h (h12)	2.6	3.7	5	3.7	3.7	5	6.5	7.5	5	6.5	7.5
L =	6.76	9.66	12.65	9.66	9.66	12.65	15.72	18.57	12.65	15.72	18.57
d2	7	10	-	10	10	13	16	-	13	16	19

APPLICATION DATA

For shaft Ø 3	>	6	6	8	8	8	8	-	10	10	10	-
	≤	8	8	10	10	10	10	-	12	12	12	-
For shaft Ø 4	>	10	10	12	12	12	12	12	17	17	17	17
	≤	12	12	17	17	17	17	17	22	22	22	22

b (h9)	4 2	5	5	5	6	6	6 2	6 2	8	8	10
h (h12)	9	6.5	7.5	9	9	11	13	15	11	13	13
L =	21.63	15.72	18.57	21.63	21.63	27.35	31.43	37.14	27.35	31.43	31.43
d2	-	16	19	22	22	28	-	-	28	32	32

APPLICATION DATA

For shaft Ø 3	>	12	12	12	-	17	-	22	-	22	-	30
	≤	17	17	17	-	22	-	30	-	30	-	38
For shaft Ø 4	>	22	22	22	22	30	30	38	-	38	38	38
	≤	30	30	30	30	38	38	-	-	-	-	-

SIZE AVAILABLE					
b x h	b x h	b x h	b x h	b x h	b x h
2 x 2.6mm	3 x 3.7mm	4 x 5mm	5 x 6.5mm	6 x 9mm	8 x 11mm
2 x 3.7mm	3 x 5mm	4 x 6.5mm	5 x 7.5mm	6 x 11mm	8 x 13mm
2 x 5mm	3 x 6.5mm	4 x 7.5mm	5 x 9mm	6 x 13mm	
	3 x 7.5mm	4 x 9mm		6 x 15mm	10 x 13mm
2.5 x 3.7mm					

- 1- Steel for keys according to DIN 6882
- 2- This size is not DIN standardized
- 3- Application is valid for keys, which are used as a fitting key transmitting the whole turning moment.
- 4- Application is valid for keys, which are used only for the positioning of the driving element, while for the transmission of the turning moment other articles e.g. parallel key or taper pins are used.

TAPER KEYS with GIB HEAD - STEEL



ISO : R 774
DIN : 6887
NEN : -
ANSI : -
BS : 4235-2
NF : -



b (h9)	6	8	10	12	14	16	18
h (nom.)	6	7	8	8	9	10	11
h1	6.1	7.2	8.2	8.2	9.2	10.2	11.2
h2	10	11	12	12	14	16	18

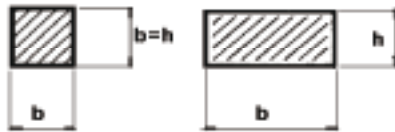
SIZE AVAILABLE					
b x h x L	b x h x L	b x h x L	b x h x L	b x h x L	b x h x L
6 x 6 x 40mm	10 x 8 x 40mm	12 x 8 x 40mm	14 x 9 x 50mm	16 x 10 x 63mm	18 x 11 x 63mm
	10 x 8 x 50mm	12 x 8 x 50mm	14 x 9 x 63mm	16 x 10 x 70mm	18 x 11 x 70mm
8 x 7 x 40mm	10 x 8 x 63mm	12 x 8 x 63mm	14 x 9 x 70mm	16 x 10 x 80mm	18 x 11 x 80mm
8 x 7 x 50mm	10 x 8 x 70mm	12 x 8 x 70mm	14 x 9 x 80mm	16 x 10 x 90mm	18 x 11 x 90mm
8 x 7 x 63mm	10 x 8 x 80mm	12 x 8 x 80mm	14 x 9 x 90mm	16 x 10 x 100mm	18 x 11 x 100mm
8 x 7 x 70mm	10 x 8 x 90mm	12 x 8 x 90mm	14 x 9 x 100mm		18 x 11 x 140mm
8 x 7 x 80mm	10 x 8 x 100mm	12 x 8 x 100mm			

ASSEMBLY DATA

- 1- Spring steel
 - 2- Form of shaft a = round, b = flattened on one side.
- WARNING: Electro galvanizing of these products may cause hydrogen embrittlement.

PINS & KEYS

BRIGHT KEY STEEL: Length 1 Meter - STEEL



ISO	:	-
DIN	:	6880
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



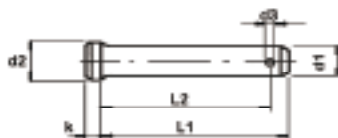
SIZE AVAILABLE					
b x h	b x h	b x h	b x h	b x h	b x h
3 x 3mm	7 x 7mm	12 x 12mm	16 x 16mm	20 x 20mm	32 x 18mm
4 x 4mm	8 x 7mm	14 x 9mm	18 x 11mm	22 x 14mm	36 x 20mm
5 x 5mm	8 x 8mm	14 x 14mm	18 x 18mm	22 x 22mm	40 x 22mm
6 x 6mm	10 x 8mm			25 x 14mm	
	12 x 8mm	16 x 10mm	20 x 12mm	20 x 16mm	45 x 25mm

1- Bright key steel is cold drawn with rather smooth and bright surface and corresponding to a high accuracy of dimensions.

Usable for the manufacturing of parallel keys according to DIN 6885 and taper keys, with grip head acc. to DIN 6887.

2- For b is the tolerance h9 and for h tolerance h11 (except the size 12 x 8 and square key steel having for b as well as h tolerance h9).

CLEVIS PINS with SMALL HEAD and SPLIT PIN HOLE - STEEL ZINC PLATED



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

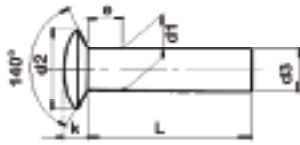


d1 (h11)	4	5	6	8	10	12	14	16
d2 (h14)	6	8	9	12	14	17	19	21
d3 (H14)	1	1.6	1.6	2	3.2	4	4	4
k (js 14)	1	1.5	1.5	2	2	3	3	3

SIZE AVAILABLE		
d1 x L1 x L2	d1 x L1 x L2	d1 x L1 x L2
4 x 12 x 9.2mm	8 x 22 x 18.7mm	14 x 40 x 31.5mm
5 x 14 x 11.5mm	10 x 28 x 23.5mm	16 x 45 x 34.5mm
6 x 18 x 14.5mm	13 x 35 x 28.2mm	

PINS & KEYS

MUSHROOM HEAD RIVETS - STEEL



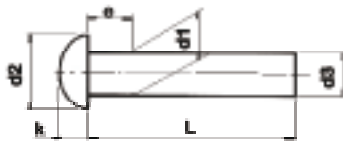
ISO : R 1051
DIN : 662
NEN : -
ANSI : -
BS : 4620
NF : -



Nr.	2	3	4	5	6	7	8	9	11	12	15
d1	2	2.3	2.5	2.8	3	3.3	3.5	4	4.5	5	6
d2	4	4.6	5	5.6	6	6.6	7	8	9	10	12
d3 (min.)	1.87	2.17	2.37	2.67	2.87	3.17	3.37	3.87	4.37	4.82	5.82
e (max)	1	1.2	1.25	1.4	1.5	1.7	1.75	2	2.3	2.5	3
k =	1	1.1	1.2	1.4	1.5	1.7	1.8	2.1	2.3	2.5	3
L	5	5	6	6.5	8	8.5	10	12	13	16	20

SIZE AVAILABLE		
L11	L11	L11
Nr 2	Nr 6	Nr 11
Nr 3	Nr 7	Nr 12
Nr 4	Nr 8	Nr 15
Nr 5	Nr 9	

ROUND HEAD RIVETS - STEEL



ISO : R 1051
DIN : 660/124
NEN : -
ANSI : -
BS : 4620
NF : -

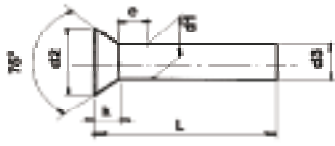


d1	2	3	4	5	6	8	10 2
d2	3.5	5.2	7	8.8	10.5	14	16
d3 (min.)	1.87	2.87	3.87	4.82	5.82	7.76	9.4
e (max)	1	1.5	2	2.5	3	4	5
k (js14)	1.2	1.8	2.4	3	3.6	4.8	6.5

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
2 x 6mm	4 x 10mm	5 x 40mm	8 x 20mm
2 x 8mm	4 x 12mm	5 x 50mm	8 x 25mm
2 x 10mm	4 x 16mm		8 x 30mm
2 x 12mm	4 x 20mm	6 x 10mm	8 x 35mm
2 x 16mm	4 x 30mm	6 x 12mm	8 x 40mm
	4 x 40mm	6 x 16mm	8 x 50mm
3 x 6mm	4 x 50mm	6 x 20mm	8 X 60mm
3 x 8mm		6 x 25mm	
3 x 10mm	5 x 8mm	6 x 30mm	10 x 20mm
3 x 12mm	5 x 10mm	6 x 35mm	10 x 25mm
3 x 16mm	5 x 12mm	6 x 40mm	10 x 30mm
3 x 20mm	5 x 16mm	6 x 50mm	10 x 35mm
3 x 25mm	5 x 12mm	6 x 50mm	10 x 40mm
3 x 30mm	5 x 16mm		10 x 50mm
	5 x 20mm	8 x 10mm	10 x 60mm
4 x 6mm	5 x 25mm	8 x 12mm	
4 x 8mm	5 x 30mm	8 x 16mm	

PINS & KEYS

COUNTERSUNK HEAD RIVETS - STEEL



ISO : R 1051
 DIN : 660/302
 NEN : -
 ANSI : -
 BS : 4620
 NF : -



d1	2	3	4	5	6	8	10 2
d2	3.5	5.2	7	8.8	10.5	14	14.5
d3 (min.)	1.87	2.87	3.87	4.82	5.82	7.76	9.4
e (max)	1	1.5	2	2.5	3	4	5
k (js14)	1	1.4	2	2.5	3	4	3

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
2 x 6mm	4 x 6mm	5 x 25mm	8 x 20mm
2 x 8mm	4 x 8mm	5 x 30mm	8 x 25mm
2 x 10mm	4 x 10mm		8 x 30mm
2 x 12mm	4 x 12mm	6 x 10mm	8 x 35mm
2 x 16mm	4 x 16mm	6 x 12mm	8 x 40mm
	4 x 20mm	6 x 16mm	8 x 50mm
3 x 6mm	4 x 25mm	6 x 20mm	8 X 60mm
3 x 8mm	4 x 30mm	6 x 25mm	
3 x 10mm		6 x 30mm	10 x 30mm
3 x 12mm	5 x 8mm	6 x 35mm	10 x 40mm
3 x 16mm	5 x 10mm	6 x 40mm	10 x 50mm
3 x 20mm	5 x 12mm	6 x 50mm	
3 x 25mm	5 x 16mm		
3 x 30mm	5 x 20mm	8 x 16mm	



DRILL BITS

CONTENTS

HAMMER DRILL BITS



HAMMER DRILL BITS



HAMMER DRILL BITS



HOLLOW CORE DRILLS



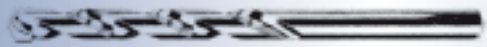
DRILL BITS for WOOD



DRILL BITS for WOOD



ROTARY IMPACT DRILLS

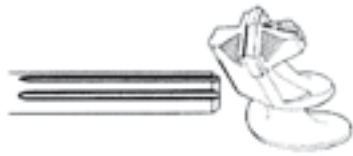


HIGH SPEED STEEL TWIST DRILLS



DRILL BITS

HAMMER DRILL BITS



Suitable for all SDS MAX Tools					
Diameter Ø	Total Length	Working Length	Diameter Ø	Total Length	Working Length
12	340	200	28	370	250
12	540	400	28	570	450
12	690	550	28	670	550
14	340	200	30	370	250
14	540	400	30	570	450
15	340	200	32	370	250
15	540	400	32	570	450
16	340	200	32	920	800
16	540	400	35	370	250
18	340	200	35	570	450
18	540	400	35	670	550
20	320	200	38	370	250
20	520	400	38	570	450
20	920	800	40	370	250
22	320	200	40	570	450
22	520	400	40	920	800
22	920	800			
24	320	200			
24	520	400			
25	320	200			
25	520	400			
25	920	800			



SPLINE SHANK					
Diameter Ø	Total Length	Working Length	Diameter Ø	Total Length	Working Length
12.0	410	250	25.0	400	250
12.0	560	410	26.0	560	410
14.0	560	410	26.0	580	700
15.0	400	250	28.0	400	250
16.0	400	250	28.0	410	530
16.0	560	410	30.0	400	250
18.0	400	250	30.0	560	410
18.0	560	410	32.0	400	250
19.0	560	410	32.0	560	410
20.0	400	250	36.0	400	250
20.0	560	410	36.0	560	410
22.0	400	250	38.0	400	250
22.0	560	410	38.0	560	410
24.0	400	250			

DRILL BITS

HAMMER DRILL BITS



Suitable for all SDS + Tools					
Diameter Ø	Total Length	Working Length	Diameter Ø	Total Length	Working Length
4.0	110	50	12.0	310	250
5.0	110	50	12.0	450	400
5.0	160	100	12.0	600	550
5.5	110	50	14.0	166	100
5.5	160	100	14.0	266	200
6.0	110	50	14.0	450	400
6.0	160	100	15.0	100	166
6.0	210	150	15.0	266	200
6.0	260	200	16.0	216	150
6.5	160	100	16.0	300	250
7.0	110	50	16.0	450	400
7.0	160	100	16.0	600	550
8.0	110	50	18.0	200	150
8.0	160	100	18.0	300	250
8.0	210	150	18.0	450	400
8.0	260	200	20.0	200	150
8.0	400	350	20.0	300	250
9.0	210	150	20.0	450	400
10.0	110	50	22.0	250	200
10.0	160	100	22.0	450	400
10.0	210	150	24.0	250	200
10.0	310	250	24.0	450	400
10.0	450	400	25.0	250	200
10.0	600	550	25.0	450	400
11.0	160	100	26.0	250	200
11.0	260	200	26.0	450	400
12.0	166	100			
12.0	216	150			

HOLLOW CORE DRILLS



Available Size	
Diameter Ø	Diameter Ø
millimeter	Inches
30.0	-
35.0	1-3/8
40.0	1-9/16
45.0	1-3/4
50.0	2
55.0	2-1/8
60.0	2-1/4
65.0	2-1/2
75.0	3
80.0	3-1/8
90.0	3-1/2
100.0	4
115.0	4-1/2
125.0	5
130.0	5-1/8
152.4	6

DRILL BITS

DRILL BITS for WOOD



FLAT MILLING WOOD BITS	
Diameter Ø	Total Length
6.0	160
8.0	160
10.0	160
12.0	160
13.0	160
14.0	160
16.0	160
17.0	160
18.0	160
19.0	160
20.0	160
22.0	160
24.0	160
25.0	160
28.0	170
30.0	170
32.0	170
35.0	170
38.0	170
40.0	170



BRAD POINT WOOD BITS		
Diameter Ø	Working Length	Total Length
3.0	30	60
4.0	43	75
5.0	50	85
6.0	52	90
7.0	68	110
8.0	75	120
9.0	78	125
10.0	80	130
11.0	90	140
12.0	100	150
13.0	100	150
14.0	105	160
15.0	105	170
16.0	115	180

DRILL BITS

ROTARY IMPACT DRILLS



SIZE AVAILABLE					
Diameter Ø	Total Length	Working Length	Diameter Ø	Total Length	Working Length
4.0	75	40	9.0	200	135
4.5	85	50	10.0	120	80
4.5	150	85	10.0	150	85
5.0	85	50	10.0	200	135
5.0	150	85	10.0	300	250
5.5	85	50	10.0	400	350
5.5	150	85	10.0	600	550
6.0	100	60	11.0	150	90
6.0	150	85	11.0	300	250
6.5	100	60	12.0	150	90
6.5	150	85	12.0	200	135
6.5	300	250	12.0	300	250
7.0	100	60	12.0	400	350
7.0	150	85	13.0	150	90
7.0	200	135	13.0	300	250
7.0	300	250	13.0	400	350
8.0	120	80	14.0	150	90
8.0	150	85	14.0	300	250
8.0	200	135	14.0	400	350
8.0	300	250	15.0	150	90
8.0	400	350	15.0	300	250
8.0	600	550	15.0	400	350
9.0	120	80			

HIGH SPEED STEEL TWIST DRILLS



Available Size		Available Size	
Diameter Ø	Diameter Ø	Diameter Ø	Diameter Ø
millimeter	Inches	millimeter	Inches
1.0	1/16	7.5	19/64
1.5	5/64	8.0	5/16
2.0	3/32	8.5	21/64
2.5	7/64	9.0	11/32
3.0	1/8	9.5	23/64
3.3	9/64	10.0	3/8
3.5	5/32	10.5	25/64
4.0	11/64	11.0	13/32
4.2	3/16	11.5	27/64
4.5	13/64	12.0	7/16
5.0	7/32	12.5	29/64
5.5	15/64	13.0	15/32
6.0	1/4		31/64
6.5	17/64		1/2
7.0	9/32		



RIVETS

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253 CONVENTIONAL BLIND RIVETS - Aluminum with Stainless Steel A2 mandrel



254 CONVENTIONAL BLIND RIVETS - Aluminum BLACK Anodised With Steel Zinc Plated mandrel



254 CONVENTIONAL BLIND RIVETS - Steel Zinc Plated with Steel Zinc Plated mandrel



254 CONVENTIONAL BLIND RIVETS - COPPER with Steel Zinc Plated mandrel



255 CONVENTIONAL BLIND RIVETS - Stainless Steel A2 and A4 With Stainless Steel mandrel



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258 HEAVY DUTY BLIND RIVETS - COPPER/NICKLE Zinc plated with Steel Zinc plated mandrel and Copper/Nickle Zinc plated with Stainless Steel mandrel



259 HEAVY DUTY BLIND RIVETS - Aluminum with Steel Zinc plated mandrel



259 HEAVY DUTY BLIND RIVETS - Aluminum with Steel Zinc plated mandrel



260 HEAVY DUTY BLIND RIVETS - STEEL Zinc plated with Zinc plated mandrel



260 HEAVY DUTY BLIND RIVETS - STEEL Zinc plated with Zinc plated mandrel



261 SEALED BLIND RIVETS - WATER & GASPROOF Aluminum with Steel Zinc plated mandrel



261 SEALED BLIND RIVETS - WATER & GASPROOF Aluminum with Steel mandrel



262 SEALED BLIND RIVETS - WATER & GASPROOF Aluminum with Stainless Steel mandrel



262 SEALED BLIND RIVETS - WATER & GASPROOF Stainless Steel with Stainless Steel mandrel



RIVETS

BLIND RIVETS

General : Blind rivet consists of a rivet sleeve (hollow rivet) mounted on a mandrel, which is provided with a notch (break neck).

Assembly : the blind rivet is placed in the hole on the front of the construction. The mandrel is retracted by a special tool, the rivet sleeve forms a head on the back. As soon as the breaking strength of the mandrel is surpassed, it will break on the notch producing a firm connection of the component parts, see assembly sequence below.

Application: this method of assembly is especially suitable when access to the back of the construction is difficult or not possible, e.g. hollow profiles, corners and ledges (blind assembly).

Grip range : in order to achieve the optimal connection it is necessary to take the right grip range S. it is preferable to choose the total thickness of material in the lower part of the grip range. For larger series it is advised to take some tests before. Full automatic production requires special demands and agreed arrangements.



Conventional type blind rivets

- For general use with break-neck just under the head of the mandrel
- Universal hollow rivet acc. To DIN 7337
- Larger grip range and lower shear force than Fero blind rivets
- Fabory also available as extended grip range blind rivets.



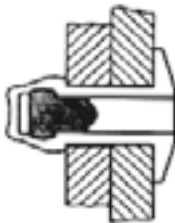
Claw type blind rivets

- For assembling soft and brittle materials e.g. plastic, glass-fibre, loam plastic, leather, softwood etc.
- the sleeve splits like a tulip.
- No damaging



Heavy duty blind rivets

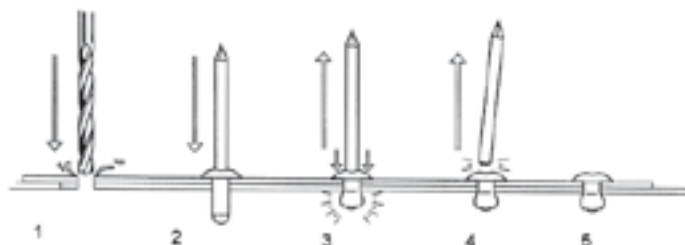
- For technical high quality applications with break - neck of the mandrel at the end of the sleeve
- mandrel remains in the sleeve after breaking.
- very high shear force equivalent to that of a solid rivet.
- vibration proof, mandrel locked against falling out.
- splash and drip watertight



Sealed type blind rivets

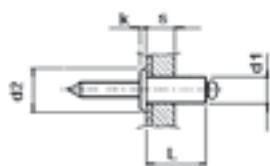
- For closed, sealed rivet application.
- head of mandrel can not fall out
- rest of mandrel is protected against corrosion.
- neat appearance where formed head is visible.
- high rate of radial expansion, complete filling of rivet hole, less suitable for soft materials.

ASSEMBLY SEQUENCE



RIVETS

CONVENTIONAL BLIND RIVETS - Aluminum with Steel Zinc plated mandrel Aluminum with Stainless Steel A2



ISO	:	-
DIN	:	7337 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	2.4	3.0	4.0	5.0	6.0
d2	5	6	7.5	9.5	12
K	0.55	0.9	1	1.1	1.5
Drill Ø	2.45	3.1	4.1	5.1	6.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
2.4 x 4mm	4 x 5mm	5 x 10mm	5 x 50mm
2.4 x 6mm	4 x 6mm	5 x 12mm	
2.4 x 8mm	4 x 7mm	5 x 14mm	6 x 8mm
	4 x 8mm	5 x 16mm	6 x 10mm
3 x 4mm	4 x 10mm	5 x 18mm	6 x 12mm
3 x 5mm	4 x 12mm	5 x 20mm	6 x 14mm
3 x 6mm	4 x 16mm	5 x 23mm	6 x 16mm
3 x 7mm	4 x 18mm	5 x 25mm	6 x 18mm
3 x 8mm	4 x 20mm	5 x 28mm	6 x 20mm
3 x 10mm		5 x 30mm	6 x 22mm
3 x 12mm	5 x 6mm	5 x 40mm	6 x 25mm
3 x 16mm	5 x 8mm	5 x 45mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
2.4 x 4.0	0.5 - 2.0	4.0 x 5.0	0.5 - 2.5	5.0 x 10.0	3.5 - 7.0	5.0 x 50.0	41.0 - 45.0
2.4 x 6.0	2.0 - 4.0	4.0 x 6.0	1.5 - 3.5	5.0 x 12.0	5.0 - 9.5		
2.4 x 8.0	4.0 - 6.0	4.0 x 7.0	2.0 - 4.5	5.0 x 14.0	7.0 - 11.5	6.0 x 8.0	10 - 4.0
		4.0 x 8.0	3.5 - 6.0	5.0 x 16.0	8.5 - 13.0	6.0 x 10.0	4.0 - 6.0
3.0 x 4.0	0.5 - 1.5	4.0 x 10.0	5.0 - 7.5	5.0 x 18.0	10.5 - 15.0	6.0 x 12.0	6.0 - 8.0
3.0 x 5.0	1.5 - 2.5	4.0 x 12.0	6.5 - 10.0	5.0 x 20.0	12.5 - 17.0	6.0 x 14.0	8.0 - 9.0
3.0 x 6.0	2.5 - 3.5	4.0 x 16.0	8.0 - 12.5	5.0 x 23.0	16.0 - 20.0	6.0 x 16.0	9.0 - 11.0
3.0 x 7.0	3.5 - 4.5	4.0 x 18.0	11.0 - 15.0	5.0 x 25.0	18.5 - 21.0	6.0 x 18.0	11.0 - 13.0
3.0 x 8.0	3.5 - 6.5	4.0 x 20.0	15.0 - 17.0	5.0 x 28.0	20.5 - 24.0	6.0 x 20.0	13.0 - 15.0
3.0 x 10.0	5.0 - 8.0			5.0 x 30.0	23.0 - 26.0	6.0 x 22.0	15.0 - 17.0
3.0 x 12.0	7.0 - 10.0	5.0 x 6.0	0.5 - 3.5	5.0 x 40.0	26.0 - 31.0		
3.0 x 16.0	10.0 - 12.5	5.0 x 8.0	2.0 - 5.0	5.0 x 45.0	31.0 - 36.0		

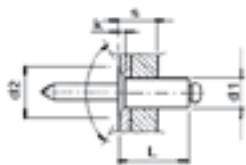
d1	4.0	5.0	5.0
d2	12	11	1.4
K	1.5	1.5	1.5
Drill Ø	4.1	5.1	5.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
4 x 8mm	5 x 8mm	5 x 16mm	5 x 25mm
4 x 10mm	5 x 10mm	5 x 18mm	5 x 28mm
4 x 12mm	5 x 12mm	5 x 20mm	5 x 30mm
	5 x 14mm	5 x 23mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
4.0 x 8.0	3.5 - 6.0	5.0 x 8.0	0.5 - 1.5	5.0 x 16.0	8.5 - 13.0	5.0 x 25.0	18.5 - 21.0
4.0 x 10.0	5.0 - 7.5	5.0 x 10.0		5.0 x 18.0	10.5 - 15.0	5.0 x 28.0	20.5 - 24.0
4.0 x 12.0	6.5 - 10.0	5.0 x 12.0	5.0 - 9.5	5.0 x 20.0	12.5 - 17.0	5.0 x 30.0	23.0 - 26.0
		5.0 x 14.0	7.0 - 11.5	5.0 x 23.0	16.0 - 20.0		

RIVETS

CONVENTIONAL BLIND RIVETS - Aluminum with Steel Zinc plated Mandrel Steel Zinc Plated with Steel Zinc plated mandrel



ISO : -
DIN : -
NEN : -
ANSI : B18.17
BS : -
NF : -

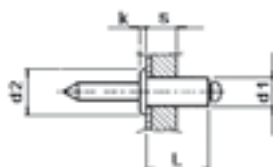


d1	3.0	4.0	5.0
d2	6	7.5	9
K =	0.9	1	1.2
Drill Ø	3.1	4.1	5.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 5mm	4 x 6mm	5 x 5mm	5 x 16mm
3 x 6mm	4 x 8mm	5 x 6mm	5 x 18mm
3 x 8mm	4 x 10mm	5 x 8mm	5 x 20mm
3 x 10mm	4 x 12mm	5 x 10mm	5 x 23mm
3 x 12mm	4 x 16mm	5 x 12mm	5 x 25mm
3 x 16mm	4 x 18mm	5 x 14mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 5.0	1.5 - 2.5	4.0 x 6.0	1.5 - 3.5	4.0 x 18.0	11.0 - 15.0	5.0 x 14.0	7.0 - 11.5
3.0 x 6.0	2.5 - 3.5	4.0 x 7.0	2.0 - 4.5			5.0 x 16.0	8.5 - 13.0
3.0 x 8.0	3.5 - 6.5	4.0 x 8.0	3.5 - 6.0	5.0 x 6.0	0.5 - 3.5	5.0 x 18.0	10.5 - 15.0
3.0 x 10.0	5.0 - 8.0	4.0 x 10.0	5.0 - 7.5	5.0 x 8.0	2.0 - 5.0	5.0 x 20.0	12.5 - 17.0
3.0 x 12.0	7.0 - 10.0	4.0 x 12.0	6.5 - 10.0	5.0 x 10.0	3.5 - 7.0	5.0 x 23.0	16.0 - 20.0
3.0 x 16.0	10.0 - 12.5	4.0 x 16.0	8.0 - 12.5	5.0 x 12.0	5.0 - 9.5	5.0 x 25.0	18.5 - 21.0

CONVENTIONAL BLIND RIVETS - Aluminum with Stainless Steel A2 mandrel



ISO : -
DIN : -
NEN : -
ANSI : B18.17
BS : -
NF : -



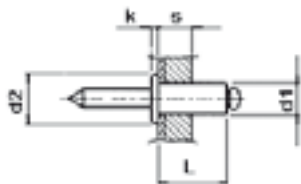
d1	3.0	4.0	5.0	6.0
d2	6.5	8	9.5	12
K	0.8	1	1.1	1.5
Drill Ø	3.1	4.1	5.1	6.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 4mm	4 x 6mm	5 x 5mm	5 x 25mm
3 x 5mm	4 x 7mm	5 x 6mm	5 x 28mm
3 x 6mm	4 x 8mm	5 x 8mm	5 x 30mm
3 x 7mm	4 x 10mm	5 x 10mm	
3 x 8mm	4 x 12mm	5 x 12mm	6 x 10mm
3 x 10mm	4 x 16mm	5 x 14mm	6 x 12mm
3 x 12mm	4 x 18mm	5 x 16mm	6 x 14mm
	4 x 20mm	5 x 18mm	6 x 16mm
4 x 4mm	4 x 25mm	5 x 20mm	6 x 18mm
4 x 5mm		5 x 23mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 4.0	.05 - 1.5	4.0 x 5.0	0.5 - 2.5	5.0 x 5.0	0.5 - 2.5	5.0 x 25.0	18.5 - 21.0
3.0 x 5.0	1.5 - 2.5	4.0 x 6.0	1.5 - 3.5	5.0 x 6.0	0.5 - 3.5	5.0 x 27.0	21.0 - 24.0
3.0 x 6.0	2.5 - 3.5	4.0 x 7.0	2.0 - 4.5	5.0 x 8.0	2.0 - 5.0	5.0 x 28.0	20.5 - 24.0
3.0 x 7.0	3.5 - 4.5	4.0 x 8.0	3.5 - 6.0	5.0 x 10.0	3.5 - 7.0	5.0 x 30.0	23.0 - 26.0
3.0 x 8.0	3.5 - 6.5	4.0 x 10.0	5.0 - 7.5	5.0 x 12.0	5.0 - 9.5		
3.0 x 10.0	5.0 - 8.0	4.0 x 12.0	6.5 - 10.0	5.0 x 14.0	7.0 - 11.5	6.0 x 10.0	4.0 - 6.0
3.0 x 12.0	7.0 - 10.0	4.0 x 16.0	8.0 - 12.5	5.0 x 16.0	8.5 - 13.0	6.0 x 12.0	6.0 - 8.0
		4.0 x 18.0	11.0 - 15.0	5.0 x 18.0	10.5 - 15.0	6.0 x 14.0	8.0 - 9.0
4.0 x 4.0	0.5 - 1.5	4.0 x 20.0	15.0 - 17.0	5.0 x 20.0	12.5 - 17.0	6.0 x 16.0	9.0 - 11.0
		4.0 x 25.0	17.0 - 22.0	5.0 x 23.0	16.0 - 20.0	6.0 x 18.0	11.0 - 13.0

RIVETS

CONVENTIONAL BLIND RIVETS - Aluminum BLACK Anodised With Steel Zinc Plated mandrel



ISO	:	-
DIN	:	7337 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.0	4.0
d2	6.5	8.0
K =	0.8	1.0
Drill Ø	3.1	4.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 8mm	3 x 12mm	4 x 8mm	4 x 12mm
3 x 10mm		4 x 10mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 8.0	3.5 - 6.5	3.0 x 12.0	7.0 - 10.0	4.0 x 8.0	3.5 - 6.0	4.0 x 10.0	5.0 x - 7.5
3.0 x 10.0	5.0 - 8.0					4.0 x 12.0	6.5 - 10.0

CONVENTIONAL BLIND RIVETS - Steel Zinc Plated with Steel Zinc Plated mandrel

d1	3.0	4.0	5.0
d2	6.5	8	9.5
K	0.8	1.0	1.1
Drill Ø	3.1	4.1	5.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 5mm	3 x 12mm	4 x 12mm	5 x 14mm
3 x 6mm			5 x 16mm
3 x 7mm	4 x 6mm	5 x 8mm	5 x 18mm
3 x 8mm	4 x 8mm	5 x 10mm	5 x 20mm
3 x 10mm	4 x 10mm	5 x 12mm	5 x 25mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 5.0	0.5 - 1.5	3.0 x 12.0	7.0 - 9.0	4.0 x 12.0	6.0 - 9.0	5.0 x 14.0	8.5 - 10.5
3.0 x 6.0	1.5 - 2.5					5.0 x 16.0	10.5 - 12.5
3.0 x 7.0	2.5 - 3.5	4.0 x 6.0	0.5 - 3.0	5.0 x 8.0	2.5 - 4.5	5.0 x 18.0	12.5 - 14.5
3.0 x 8.0	3.5 - 5.0	4.0 x 8.0	3.0 - 5.0	5.0 x 10.0	4.5 - 6.5	5.0 x 20.0	14.5 - 17.5
3.0 x 10.0	5.0 - 7.0	4.0 x 10.0	4.0 - 7.0	5.0 x 12.0	6.5 - 8.0	5.0 x 25.0	17.5 - 20.0

CONVENTIONAL BLIND RIVETS - COPPER with Steel Zinc Plated mandrel

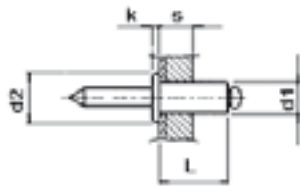
d1	3.0	4.0
d2	6.5	8.0
K =	0.8	1.0
Drill Ø	3.1	4.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 5mm	3 x 10mm	4 x 5mm	4 x 10mm
3 x 6mm	3 x 12mm	4 x 6mm	4 x 12mm
3 x 8mm		4 x 8mm	4 x 16mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 5.0	0.5 - 2.5	3.0 x 10.0	5.0 - 7.0	4.0 x 5.0	0.5 - 2.5	4.0 x 10.0	5.5 - 7.5
3.0 x 6.0	2.5 - 3.5	3.0 x 12.0	7.0 - 10.0	4.0 x 6.0	2.5 - 3.5	4.0 x 12.0	7.5 - 10.0
3.0 x 8.0	3.5 - 5.0			4.0 x 8.0	3.5 - 5.5	4.0 x 16.0	10.0 - 12.5

RIVETS

CONVENTIONAL BLIND RIVETS - Stainless Steel A2 and A4 With Stainless Steel mandrel



ISO	:	-
DIN	:	7337 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

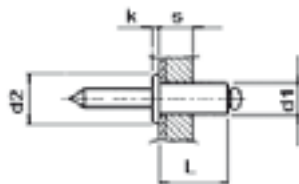


d1	3.0	4.0	5.0
d2	6.5	8.0	9.5
K =	0.8	1.0	1.1
Drill Ø	3.1	4.1	5.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 6mm	4 x 8mm	4 x 18mm	5 x 12mm
3 x 8mm	4 x 10mm		5 x 16mm
3 x 10mm	4 x 12mm	5 x 8mm	5 x 18mm
3 x 12mm	4 x 16mm	5 x 10mm	5 x 20mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 6.0	1.0 - 3.0	4.0 x 8.0	2.5 - 4.5	4.0 x 18.0	11.5 - 14.0	5.0 x 12.0	6.0 - 8.0
3.0 x 8.0	3.0 - 5.0	4.0 x 10.0	4.5 - 6.5			5.0 x 16.0	8.0 - 10.0
3.0 x 10.0	5.0 - 7.0	4.0 x 12.0	6.5 - 8.5	5.0 x 8.0	1.5 - 4.0	5.0 x 18.0	10.0 - 13.0
3.0 x 12.0	7.0 - 9.0	4.0 x 16.0	8.5 - 11.5	5.0 x 10.0	4.0 - 6.0	5.0 x 20.0	13.0 - 16.0

CONVENTIONAL EXTENDED GRIP RANGE BLIND RIVETS Aluminum with Steel Zinc Plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



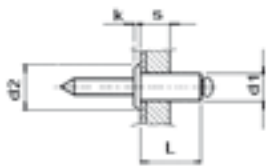
d1	3.2	4.0	4.8
d2	6.3	8	9.5
K	1	1.35	1.5
Drill Ø	3.3	4.1	4.9

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 8mm	4 x 9.5mm	4 x 16.9mm	4.8 x 15.1mm
3.2 x 9.5mm	4 x 12.7mm		4.8 x 16.9mm
3.2 x 11mm		4.8 x 10.3mm	4.8 x 24.6mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 8.0	0.7 - 4.8	4.0 x 9.5	1.3 - 6.4	4.0 x 16.9	6.0 - 12.7	4.8 x 15.1	4.0 - 6.4
3.0 x 9.5	1.3 - 6.4	4.0 x 12.7	4.0 - 9.6			4.8 x 16.9	4.0 - 11.0
3.2 x 11.0	4.0 - 7.9			4.8 x 10.3	1.6 - 6.4	4.8 x 24.8	12.7 - 19.8

RIVETS

CLAW TYPE BLIND RIVETS - Aluminum with Steel Zinc plated mandrel



ISO	:	-
DIN	:	7337 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



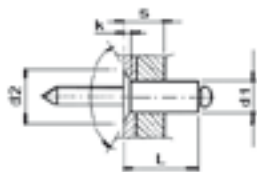
d1	2.4 (3/32)	3.2 (1/8)	4.0 (5/32)	4.8 (3/18)	5.0	5.0	6.4 (1/4)
d2	5	6.5	8	9.5	9.5	16	13
K	0.55	0.8	1	1.1	1.1	1.8	1.8
Drill Ø	2.5 + 0.05	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1	5.1 + 0.1	5.1 + 0.1	6.5 + 0.2

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
2.4 x 4mm	4.0 x 5mm	4.8 x 16.0mm	5.0 x 22.0mm
2.4 x 6mm	4.0 x 7mm	4.8 x 18.0mm	5.0 x 25.0mm
2.4 x 8mm	4.0 x 8mm	4.8 x 20.0mm	5.0 x 28.0mm
	4.0 x 10mm	4.8 x 23.0mm	5.0 x 30.0mm
3.2 x 4mm	4.0 x 12mm	4.8 x 25.0mm	5.0 x 35.0mm
3.2 x 5mm	4.0 x 16mm		5.0 x 40.0mm
3.2 x 6mm	4.0 x 18mm	5.0 x 6.0mm	5.0 x 45.0mm
3.2 x 7mm		5.0 x 8.0mm	5.0 x 50.0mm
3.2 x 8mm	4.8 x 5.5mm	5.0 x 10.0mm	
3.2 x 10mm	4.8 x 6.0mm	5.0 x 12.0mm	6.4 x 12.0mm
3.2 x 12mm	4.8 x 7.0mm	5.0 x 14.0mm	6.4 x 20.0mm
3.2 x 14mm	4.8 x 9.0mm	5.0 x 16.0mm	6.4 x 28.0mm
	4.8 x 12.0mm	5.0 x 18.0mm	6.4 x 32.0mm
	4.8 x 14.0mm	5.0 x 20.0mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
2.4 x 4.0	0.5 - 2.0	4.0 x 8.0	3.5 - 6.0	4.8 x 20.0	12.5 - 16.0	5.0 x 25.0	18.5 - 21.0
2.4 x 6.0	2.0 - 4.0	4.0 x 10.0	5.0 - 7.5	4.8 x 23.0	16.0 - 18.5	5.0 x 28.0	20.5 - 24.0
2.4 x 8.0	4.0 - 6.0	4.0 x 12.0	6.5 - 10.0	4.8 x 25.0	18.5 - 21.0	5.0 x 30.0	23.0 - 26.0
		4.0 x 16.0	8.0 - 12.5			5.0 x 35.0	26.0 - 31.0
3.2 x 4.0	0.5 - 1.5	4.0 x 18.0	11.0 - 15.0	5.0 x 6.0	0.5 - 3.5	5.0 x 40.0	26.0 - 31.0
3.2 x 5.0	1.5 - 2.5			5.0 x 8.0	2.0 - 5.0	5.0 x 45.0	31.0 - 36.0
3.2 x 6.0	2.5 - 3.5	4.8 x 5.5	-1.5	5.0 x 10.0	3.5 - 7.0	5.0 x 50.0	41.0 - 45.0
3.2 x 8.0	3.5 - 5.0	4.8 x 6.0	1.0 - 3.5	5.0 x 12.0	5.0 - 9.5		
3.2 x 10.0	5.0 - 7.0	4.8 x 7.0	1.5 - 4.5	5.0 x 14.0	7.0 - 11.5	6.4 x 12.0	- 6.0
3.2 x 12.0	7.0 - 8.5	4.8 x 9.0	3.5 - 6.0	5.0 x 16.0	8.5 - 13.0	6.4 x 20.0	6.0 - 13.0
3.2 x 14.0	8.5 - 10.5	4.8 x 12.0	5.0 - 8.5	5.0 x 18.0	10.5 - 15.0	6.4 x 26.0	13.0 - 20.0
		4.8 x 14.0	7.0 - 10.5	5.0 x 20.0	12.5 - 17.0	6.4 x 32.0	20.0 - 26.0
4.0 x 5.0	0.5 - 2.5	4.8 x 16.0	8.5 - 11.5	5.0 x 22.0	16.0 - 20.0		
4.0 x 7.0	2.0 - 4.5	4.8 x 18.0	10.5 - 12.5				

RIVETS

CLAW TYPE BLIND RIVETS - Aluminum with Steel Zinc plated mandrel COPPER / NICKEL with Steel Zinc plated mandrel



ISO	:	-
DIN	:	7337 B
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

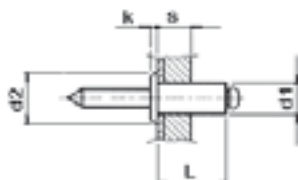


d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6.5	8	9.5
K	0.8	1	1.1
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 4.0mm	3.2 x 10.0mm	4.0 x 8.0mm	4.0 x 18.0mm
3.2 x 5.0mm	3.2 x 12.0mm	4.0 x 10.0mm	
3.2 x 6.0mm		4.0 x 12.0mm	4.8 x 12.0mm
3.2 x 8.0mm	4.0 x 7.0mm	4.0 x 16.0mm	4.8 x 16.0mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 4.0	0.5 - 1.5	3.2 x 10.0	5.0 - 7.0	4.0 x 8.0	3.5 - 6.0	4.0 x 18.0	11.0 - 15.0
3.2 x 5.0	1.5 - 2.5	3.2 x 12.0	7.0 - 8.5	4.0 x 10.0	5.0 - 7.5		
3.2 x 6.0	2.5 - 3.5			4.0 x 12.0	6.5 - 10.0	4.8 x 12.0	5.0 - 8.5
3.2 x 8.0	3.5 - 5.0	4.0 x 7.0	2.0 - 4.5	4.0 x 16.0	8.0 - 12.5	4.8 x 16.0	8.5 - 11.5

CLAW TYPE BLIND RIVETS - STEEL with Steel Zinc plated mandrel



ISO	:	-
DIN	:	7337 A
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



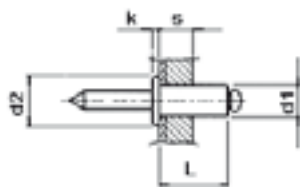
d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)	6.4 (1/4)
d2	6.5	8	9.5	13
K	0.8	1	1.1	1.8
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1	6.5 + 0.2

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 5.0mm	4.0 x 6.0mm	4.8 x 7.0mm	6.4 x 8.0mm
3.2 x 6.0mm	4.0 x 7.0mm	4.8 x 9.0mm	6.4 x 12.0mm
3.2 x 8.0mm	4.0 x 9.0mm	4.8 x 10.0mm	6.4 x 18.0mm
3.2 x 10.0mm	4.0 x 12.0mm	4.8 x 14.0mm	6.4 x 22.0mm
3.2 x 12.0mm		4.8 x 18.0mm	6.4 x 25.0mm
		4.8 x 20.0mm	6.4 x 30.0mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 5.0	0.5 - 2.0	4.0 x 6.0	0.5 - 3.0	4.8 x 7.0	1.0 - 4.5	6.4 x 8.0	1.0 - 4.0
3.2 x 6.0	2.0 - 3.0	4.0 x 7.0	3.0 - 4.0	4.8 x 9.0	3.5 - 6.5	6.4 x 12.0	4.0 - 7.5
3.2 x 8.0	3.0 - 5.0	4.0 x 9.0	4.0 - 6.0	4.8 x 10.0	5.5 - 6.5	6.4 x 18.0	7.5 - 12.5
3.2 x 10.0	5.0 - 7.0	4.0 x 12.0	6.0 - 9.0	4.8 x 14.0	6.5 - 11.0	6.4 x 22.0	12.5 - 16.0
3.2 x 12.0	7.0 - 9.5			4.8 x 18.0	9.0 - 14.5	6.4 x 25.0	13.0 - 19.0
				4.8 x 20.0	12.5 - 15.0	6.4 x 30.0	19.0 - 25.0

RIVETS

HEAVY DUTY BLIND RIVETS - Aluminum with Aluminum mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6.5	8	9.5
K	0.8	1	1.1
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 4.5mm	4 x 5.5mm	4 x 18.5mm	4.8 x 13.0mm
3.2 x 5.5mm	4 x 6.5mm		4.8 x 16.5mm
3.2 x 6.5mm	4 x 7.5mm	4.8 x 7.5mm	4.8 x 19.0mm
3.2 x 8.0mm	4 x 8.5mm	4.8 x 8.5mm	4.8 x 21.5mm
3.2 x 10.0mm	4 x 10.5mm	4.8 x 9.5mm	4.8 x 24.0mm
3.2 x 12.0mm	4 x 12.5mm	4.8 x 10.5mm	4.8 x 29.0mm
	4 x 15.5mm	4.8 x 11.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 4.5	0.5 - 2.5	4 x 5.5	0.5 - 2.5	4 x 18.5	12.5 - 15.5	4.8 x 13.0	8.5 - 10.0
3.2 x 5.5	0.5 - 3.5	4 x 6.5	2.5 - 3.5			4.8 x 16.5	10.0 - 12.5
3.2 x 6.5	3.5 - 4.5	4 x 7.5	3.5 - 4.5	4.8 x 7.5	0.5 - 4.5	4.8 x 19.0	12.5 - 15.0
3.2 x 8.0	4.5 - 6.0	4 x 8.5	4.5 - 5.5	4.8 x 8.5	4.5 - 5.5	4.8 x 21.5	15.0 - 17.5
3.2 x 10.0	6.0 - 8.0	4 x 10.5	5.5 - 7.5	4.8 x 9.5	5.5 - 6.5	4.8 x 24.0	17.5 - 20.0
3.2 x 12.0	8.0 - 10.0	4 x 12.5	7.5 - 9.5	4.8 x 10.5	6.5 - 7.5	4.8 x 29.0	22.5 - 25.0
		4 x 15.5	9.5 - 12.5	4.8 x 11.5	7.5 - 8.5		

EXAMPLE OF APPLICATION



Splash and dripwater tight

HEAVY DUTY BLIND RIVETS - COPPER/NICKLE Zinc plated with Steel Zinc plated mandrel and Copper/Nickle Zinc plated with Stainless Steel mandrel

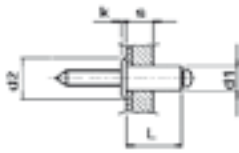
d1	3.0	3.2 (1/8)	4.0 (5/32)
d2	6.5	6.5	8
K	0.8	0.8	1
Drill Ø	3.1 + 0.1	3.3 + 0.1	4.1 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 5.0mm	3.2 x 5.0mm	3.2 x 12.0mm	4 x 12.5mm
3 x 6.0mm	3.2 x 6.0mm		4 x 14.5mm
3 x 7.0mm	3.2 x 7.0mm	4 x 6.5mm	4 x 16.5mm
3 x 8.0mm	3.2 x 8.0mm	4 x 7.5mm	4 x 18.5mm
3 x 10.0mm	3.2 x 10.0mm	4 x 10.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.0 x 6.0	2.5 - 3.5	3.2 x 5.0	0.5 - 2.5	3.2 x 12.0	7.5 - 9.5	4.0 x 12.5	7.5 - 11.5
3.0 x 7.0	3.5 - 4.5	3.2 x 6.0	2.5 - 3.5			4.0 x 14.5	9.5 - 11.5
3.0 x 8.0	4.5 - 5.5	3.2 x 7.0	3.5 - 4.5	4.0 x 6.5	0.5 - 3.5	4.0 x 16.5	11.5 - 13.5
3.0 x 10.0	5.5 - 7.5	3.2 x 8.0	4.5 - 5.5	4.0 x 7.5	3.5 - 4.5	4.0 x 18.5	13.5 - 15.5
		3.2 x 10.0	5.5 - 7.5	4.0 x 10.5	6.5 - 7.5		

RIVETS

HEAVY DUTY BLIND RIVETS - Aluminum with Steel Zinc plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

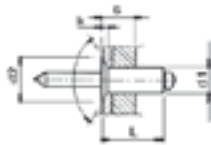


d1	3.0	4.0 (5/32)	5.0
d2	6.5	8	9.5
K	0.8	1	1.1
Drill Ø	3.1 + 0.1	4.1 + 0.1	5.1 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 4.5mm	4 x 5.0mm	5 x 6.5mm	5 x 18.0mm
3 x 5.5mm	4 x 6.0mm	5 x 7.5mm	5 x 21.0mm
3 x 6.5mm	4 x 7.0mm	5 x 8.5mm	5 x 23.0mm
3 x 8.0mm	4 x 8.0mm	5 x 9.5mm	5 x 25.5mm
3 x 10.0mm	4 x 10.0mm	5 x 10.5mm	5 x 28.0mm
3 x 12.0mm	4 x 12.0mm	5 x 11.5mm	5 x 30.5mm
	4 x 15.0mm	5 x 13.5mm	5 x 33.0mm
	4 x 18.0mm	5 x 15.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3 x 4.5	0.5 - 2.5	4 x 5.0	0.5 - 2.5	5 x 6.5	1.0 - 3.5	5 x 18.0	12.5 - 15.0
3 x 5.5	2.5 - 3.5	4 x 6.0	2.5 - 3.5	5 x 7.5	3.5 - 4.5	5 x 21.0	15.0 - 17.5
3 x 6.5	3.5 - 4.5	4 x 7.0	3.5 - 4.5	5 x 8.5	4.5 - 5.5	5 x 23.0	17.5 - 20.5
3 x 8.0	4.5 - 6.0	4 x 8.0	4.5 - 5.5	5 x 9.5	5.5 - 6.5	5 x 25.5	20.5 - 22.5
3 x 10.0	6.0 - 8.0	4 x 10.0	5.5 - 7.5	5 x 10.5	6.5 - 7.5	5 x 28.0	22.5 - 25.0
3 x 12.0	8.0 - 10.0	4 x 12.0	7.5 - 9.5	5 x 11.5	7.5 - 8.5	5 x 30.5	25.0 - 27.5
		4 x 15.0	9.5 - 12.5	5 x 13.5	8.5 - 10.0	5 x 33.0	27.5 - 30.0
		4 x 18.0	12.5 - 15.5	5 x 15.5	10.0 - 12.5		

HEAVY DUTY BLIND RIVETS - Aluminum with Steel Zinc plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.0	4.0	5.0
d2	6	7.5	9
K =	0.9	1	1.2
Drill Ø	3.1 + 0.1	4.1 + 0.1	5.1 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 4.5mm	4 x 4.0mm	5 x 5.5mm	5 x 11.5mm
3 x 5.5mm	4 x 7.0mm	5 x 6.5mm	5 x 13.0mm
3 x 6.5mm	4 x 8.0mm	5 x 7.5mm	5 x 15.5mm
3 x 8.0mm	4 x 10.0mm	5 x 8.5mm	5 x 21.0mm
3 x 10.0mm	4 x 12.0mm	5 x 9.5mm	5 x 23.0mm
		5 x 10.5mm	5 x 25.5mm

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3 x 4.5	0.5 - 2.5	4 x 4.0	0.5 - 1.5	5 x 5.5	1.0 - 2.5	5 x 11.5	7.5 - 8.5
3 x 5.5	2.5 - 3.5	4 x 7.0	3.5 - 4.5	5 x 6.5	1.0 - 3.5	5 x 13.0	8.5 - 10.0
3 x 6.5	3.5 - 4.5	4 x 8.0	4.5 - 5.5	5 x 7.5	3.5 - 4.5	5 x 15.5	10.0 - 12.5
3 x 8.0	4.5 - 6.0	4 x 10.0	5.5 - 7.5	5 x 8.5	4.5 - 5.5	5 x 21.0	15.0 - 17.5
3 x 10.0	6.0 - 8.0	4 x 12.0	7.5 - 9.5	5 x 9.5	5.5 - 6.5	5 x 23.0	17.5 - 20.5
				5 x 10.5	6.5 - 7.5	5 x 25.5	20.0 - 22.5

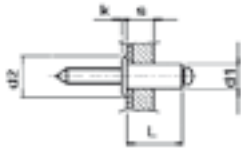
EXAMPLE OF APPLICATION



High shear force with mandrel in the shearing area

RIVETS

HEAVY DUTY BLIND RIVETS - STEEL Zinc plated with Zinc plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-

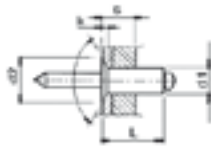


d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6.5	8	9.5
K	0.8	1	1.1
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

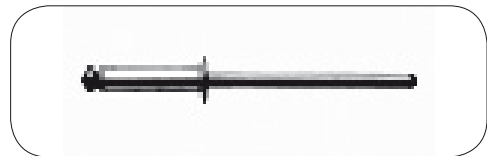
SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 5.0mm	4 x 6.5mm	4.8 x 6.5mm	4.8 x 17.0mm
3.2 x 6.0mm	4 x 7.5mm	4.8 x 7.5mm	4.8 x 19.5mm
3.2 x 7.0mm	4 x 8.5mm	4.8 x 8.5mm	4.8 x 23.5mm
3.2 x 8.0mm	4 x 9.5mm	4.8 x 9.5mm	4.8 x 25.5mm
3.2 x 10.0mm	4 x 10.5mm	4.8 x 10.5mm	4.8 x 29.5mm
3.2 x 12.0mm	4 x 12.5mm	4.8 x 11.5mm	4.8 x 31.5mm
3.2 x 14.0mm	4 x 14.5mm	4.8 x 13.5mm	4.8 x 33.5mm
	4 x 16.5mm	4.8 x 15.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 5.0	0.5 - 2.5	4 x 6.5	1.0 - 3.5	4.8 x 6.5	1.0 - 2.5	4.8 x 17.0	10.5 - 12.5
3.2 x 6.0	2.5 - 3.5	4 x 7.5	3.5 - 4.5	4.8 x 7.5	2.5 - 3.5	4.8 x 19.5	12.5 - 14.5
3.2 x 7.0	3.5 - 4.5	4 x 8.5	4.5 - 5.5	4.8 x 8.5	3.5 - 4.5	4.8 x 23.5	16.5 - 18.5
3.2 x 8.0	4.5 - 5.5	4 x 9.5	5.5 - 6.5	4.8 x 9.5	4.5 - 5.5	4.8 x 25.5	18.5 - 20.5
3.2 x 10.0	5.5 - 7.5	4 x 10.5	6.5 - 7.5	4.8 x 10.5	5.5 - 6.5	4.8 x 29.5	22.5 - 24.5
3.2 x 12.0	7.5 - 9.5	4 x 12.5	7.5 - 9.5	4.8 x 11.5	6.5 - 7.5	4.8 x 31.5	24.5 - 26.5
3.2 x 14.0	8.0 - 10.0	4 x 14.5	9.5 - 11.5	4.8 x 13.5	7.5 - 9.5	4.8 x 33.5	26.5 - 28.5
		4 x 16.5	11.5 - 13.5	4.8 x 15.5	9.5 - 10.5		

HEAVY DUTY BLIND RIVETS - STEEL Zinc plated with Zinc plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6.5	7.5	9
K	0.9	1	1.2
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

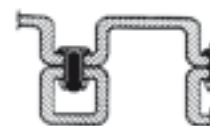
SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 8.0mm	4 x 7.5mm	4.8 x 6.5mm	4.8 x 10.5mm
3.2 x 12.0mm	4 x 8.5mm	4.8 x 7.5mm	4.8 x 11.5mm
3.2 x 14.0mm	4 x 9.5mm	4.8 x 8.5mm	4.8 x 15.5mm
	4 x 10.5mm	4.8 x 9.5mm	4.8 x 19.5mm
4 x 6.5mm	4 x 12.5mm	4.8 x 10.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 8.0	4.5 - 5.5	4 x 7.5	3.5 - 4.5	4.8 x 6.5	1.0 - 2.5	4.8 x 10.5	5.5 - 6.5
3.2 x 12.0	7.5 - 9.5	4 x 8.5	4.5 - 5.5	4.8 x 7.5	2.5 - 3.5	4.8 x 11.5	6.5 - 7.5
3.2 x 14.0	8.0 - 10.0	4 x 9.5	5.5 - 6.5	4.8 x 8.5	3.5 - 4.5	4.8 x 15.5	9.5 - 10.5
		4 x 10.5	6.5 - 7.5	4.8 x 9.5	4.5 - 5.5	4.8 x 19.5	12.5 - 14.5
4 x 6.5	1.0 - 3.5	4 x 12.5	7.5 - 9.5				

EXAMPLE OF APPLICATION



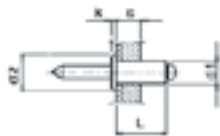
Mandrel locked against falling out



Blind riveting of hollow profile in narrow area

RIVETS

SEALED BLIND RIVETS - WATER & GASPROOF - Aluminum with Steel Zinc plated mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.0	4.0	5.0
d2	6	8	9.5
k1	0.9	1.3	1.5
Drill Ø	3.1	4.1	5.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3 x 9mm	4 x 8.5mm	5 x 10.5mm	5 x 16.5mm
3 x 10.5mm	4 x 12.5mm	5 x 12.5mm	5 x 20.5mm
3 x 12.5mm	4 x 14.5mm	5 x 14.5mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3 x 9.0	3.5 - 4.5	4 x 8.5	2.5 - 3.5	5 x 10.5	3.5 - 5.0	5 x 16.5	9.5 - 11.5
3 x 10.5	4.5 - 6.5	4 x 12.5	6.0 - 7.5	5 x 12.5	5.0 - 7.0	5 x 20.5	13.0 - 15.0
3 x 12.5	6.5 - 8.0	4 x 14.5	7.5 - 10.0	5 x 14.5	7.0 - 9.5		

SEALED BLIND RIVETS - WATER & GASPROOF - Aluminum with Steel mandrel

d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6	8	9.5
k1	0.9	1.3	1.5
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 6.5mm	3.2 x 12.5mm	4 x 12.5mm	4.8 x 14.0mm
3.2 x 8.0mm			4.8 x 16.0mm
3.2 x 9.5mm	4 x 8.0mm	4.8 x 11.0mm	4.8 x 18.0mm
3.2 x 11.0mm	4 x 9.5mm	4.8 x 12.5mm	4.8 x 21.0mm
	4 x 11mm		

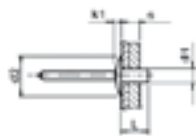
TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 6.5	0 - 2.0	3.2 x 12.5	6.5 - 8.0	4 x 12.5	6.5 - 8.0	4.8 x 14.0	8.0 - 9.5
3.2 x 8.0	2.0 - 3.5					4.8 x 16.0	9.5 - 11.0
3.2 x 9.5	3.5 - 5.0	4.0 x 8.0	0 - 3.5	4.8 x 11.0	-3.5	4.8 x 18.0	11.0 - 13.0
3.2 x 11.0	5.0 - 6.5	4.0 x 9.5	3.5 - 5.0	4.8 x 12.5	3.5 - 5.0	4.8 x 21.0	13.0 - 16.0
		4.0 x 11.0	5.0 - 6.5				

EXAMPLE OF APPLICATION



RIVETS

SEALED BLIND RIVETS - WATER & GASPROOF - Aluminum with Stainless Steel mandrel



ISO	:	-
DIN	:	-
NEN	:	-
ANSI	:	-
BS	:	-
NF	:	-



d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6	8	9.5
k1	0.9	1.3	1.5
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 6.5mm	3.2 x 12.5mm	4 x 12.5mm	4.8 x 14.0mm
3.2 x 8.0mm			4.8 x 16.0mm
3.2 x 9.5mm	4 x 8.0mm	4.8 x 11.0mm	4.8 x 18.0mm
3.2 x 11.0mm	4 x 9.5mm	4.8 x 12.5mm	4.8 x 21.0mm
	4 x 11mm		

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 6.5	0 - 2.0	3.2 x 12.5	6.5 - 8.0	4 x 12.5	6.5 - 8.0	4.8 x 14.0	8.0 - 9.5
3.2 x 8.0	2.0 - 3.5					4.8 x 16.0	9.5 - 11.0
3.2 x 9.5	3.5 - 5.0	4.0 x 8.0	0 - 3.5	4.8 x 11.0	-3.5	4.8 x 18.0	11.0 - 13.0
3.2 x 11.0	5.0 - 6.5	4.0 x 9.5	3.5 - 5.0	4.8 x 12.5	3.5 - 5.0	4.8 x 21.0	13.0 - 16.0
		4.0 x 11.0	5.0 - 6.5				

SEALED BLIND RIVETS - WATER & GASPROOF - Stainless Steel with Stainless Steel mandrel

d1	3.2 (1/8)	4.0 (5/32)	4.8 (3/16)
d2	6	8	9.5
k1	0.8	1.3	1.5
Drill Ø	3.3 + 0.1	4.1 + 0.1	4.9 + 0.1

SIZE AVAILABLE			
d1 x L	d1 x L	d1 x L	d1 x L
3.2 x 6.0mm	4 x 6.0mm	4 x 16.0mm	4.8 x 12.0mm
3.2 x 8.0mm	4 x 8.0mm		4.8 x 16.0mm
3.2 x 10.5mm	4 x 10.0mm	4.8 x 8.0mm	
3.2 x 12.0mm	4 x 12.0mm	4.8 x 10.0mm	

TECHNICAL DATA							
d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges	d1 x L	Grip Ranges
3.2 x 6.0	0.5 - 1.5	4.0 x 6.0	0.5 - 1.5	4 x 16.0	6.5 - 10.5	4.8 x 12.0	5.0 - 6.5
3.2 x 8.0	1.5 - 3.0	4.0 x 8.0	1.5 - 3.0			4.8 x 16.0	6.5 - 10.5
3.2 x 10.0	3.5 - 5.0	4.0 x 10.0	3.0 - 5.0	4.8 x 8.0	0.5 - 3.0		
3.2 x 12.0	5.0 - 6.5	4.0 x 12.0	5.0 - 6.5	4.8 x 10.0	3.0 - 5.0		

EXAMPLE OF APPLICATION





CLAMPS/DUCT FIXING

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265 HEAVY DUTY CLAMPS



266 BUTTERFLY HOSE CLAMPS



267 HEAVY DUTY ELECTRO GALVANIZED PIPE CLAMPS
Welded Dual Nuts M8 + M10 with Poze screw without Rubber



267 HEAVY DUTY ELECTRO GALVANIZED PIPE CLAMPS
Welded Dual Nut M8 + M10 With Pozi Screw With Epdm Rubber Lining



268 RAPID CLAMP ELECTRO GALVANIZED with DUAL NUT
M8 + M10 with EPDM Rubber lining



268 BEAM CLAMP - Zinc Plated



269 PURLIN CLAMP - Zinc Plated



269 STRUT CLAMP - Zinc Plated



269 BACK PLATE with DUAL NUT M8 + M10ELECTRO GALVANIZED



270 DUCT FIX - CLEVIS HANGER



270 PIPE HANGER - Adjustable Swivel Ring / Pear Clamp
ZINC PLATED with KNURLED NUT



CLAMPS/DUCT FIXING

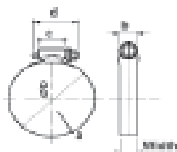
HEAVY DUTY CLAMPS



STANDARD and CHANNEL BRIDGE T-BOLTS					
Size	Min. Diameter (Inches)	Max. Diameter (Inches)	Min. Diameter (Inches)	Max. Diameter (Inches)	Installation Torque
-	1 3/8	1 9/16	35.1	38.6	75.0 in. lbs. (8.5 Nm.)
-	1 1/2	1 5/8	38.1	41.7	75.0 in. lbs. (8.5 Nm.)
-	1 5/8	1 7/8	41.4	46	75.0 in. lbs. (8.5 Nm.)
28	1 3/4	2	44.5	50.8	75.0 in. lbs. (8.5 Nm.)
32	1 7/8	2 3/16	47.8	55.6	75.0 in. lbs. (8.5 Nm.)
36	2	2 5/16	50.8	58.7	75.0 in. lbs. (8.5 Nm.)
40	2 1/8	2 7/16	54.1	62	75.0 in. lbs. (8.5 Nm.)
44	2 1/4	2 9/16	57.2	65	75.0 in. lbs. (8.5 Nm.)
48	2 3/8	2 11/16	60.5	68.3	75.0 in. lbs. (8.5 Nm.)
52	2 1/2	2 13/16	63.5	71.4	75.0 in. lbs. (8.5 Nm.)
56	2 5/8	2 15/16	66.8	74.7	75.0 in. lbs. (8.5 Nm.)
60	2 3/4	3 1/16	69.9	77.7	75.0 in. lbs. (8.5 Nm.)
64	2 7/8	3 3/16	73.2	81	75.0 in. lbs. (8.5 Nm.)
68	3	3 5/16	76.2	84.1	75.0 in. lbs. (8.5 Nm.)
72	3 1/8	3 7/16	79.5	87.4	75.0 in. lbs. (8.5 Nm.)
76	3 1/4	3 9/16	82.6	90.4	75.0 in. lbs. (8.5 Nm.)
80	3 3/8	3 11/16	85.9	93.7	75.0 in. lbs. (8.5 Nm.)
84	3 1/2	3 13/16	88.9	96.8	75.0 in. lbs. (8.5 Nm.)
88	3 5/8	3 15/16	92.2	100.1	75.0 in. lbs. (8.5 Nm.)
92	3 3/4	4 1/16	95.3	103.1	75.0 in. lbs. (8.5 Nm.)
100	4	4 5/16	101.6	109.5	75.0 in. lbs. (8.5 Nm.)
108	4 1/4	4 9/16	108	115.8	75.0 in. lbs. (8.5 Nm.)
116	4 1/2	4 13/16	114.3	122.2	75.0 in. lbs. (8.5 Nm.)
124	4 3/4	5 1/16	120.7	128.5	75.0 in. lbs. (8.5 Nm.)
132	5	5 5/16	127	134.9	75.0 in. lbs. (8.5 Nm.)
140	5 1/4	5 9/16	133.4	141.2	75.0 in. lbs. (8.5 Nm.)
148	5 1/2	5 13/16	139.7	147.6	75.0 in. lbs. (8.5 Nm.)
156	5 3/4	6 1/16	146.1	153.9	75.0 in. lbs. (8.5 Nm.)
164	6	6 5/16	152.4	160.3	75.0 in. lbs. (8.5 Nm.)
172	6 1/4	6 9/16	158.8	166.6	75.0 in. lbs. (8.5 Nm.)
180	6 1/2	6 13/16	165.1	173	75.0 in. lbs. (8.5 Nm.)
188	6 3/4	7 1/16	171.5	179.3	75.0 in. lbs. (8.5 Nm.)
196	7	7 5/16	177.8	185.7	75.0 in. lbs. (8.5 Nm.)
204	7 1/4	7 9/16	184.2	192	75.0 in. lbs. (8.5 Nm.)
212	7 1/2	7 13/16	190.5	198.4	75.0 in. lbs. (8.5 Nm.)
220	7 3/4	8 1/16	196.9	204.7	75.0 in. lbs. (8.5 Nm.)
228	8	8 5/16	203.2	211.1	75.0 in. lbs. (8.5 Nm.)
236	8 1/4	8 9/16	209.6	217.4	75.0 in. lbs. (8.5 Nm.)
244	8 1/2	8 13/16	215.9	223.8	75.0 in. lbs. (8.5 Nm.)

CLAMPS/DUCT FIXING

BUTTERFLY HOSE CLAMPS



Width	a	b	c	d	e
8.0mm	0.60	10	5	13	12

HF-2101 8MM					
SIZE	NO.	MM	NW	GW	CU FT
1/2"	-	8-13	13.0 kgs	14.0 kgs.	0.61'
5/8"	4	10-16	13.2 kgs	14-2 kgs.	0.61'
3/4"	6	13-19	13.5 kgs	14-5 kgs.	0.84'
7/8"	8	16-23	14.0 kgs	15.0 kgs.	0.84'
1"	10	13-26	15.0 kgs.	17.0 kgs.	1.23'

HF - 2301 BUTTERFLY HOSE CLAMPS BAND WIDTH 8MM					
SIZE	NO.	MM	NW	GW	CU FT
1/2"	-	8-13	22.0 kgs	23.0 kgs.	0.84'
5/8"	4	10-16	22.9 kgs	23.9 kgs.	1.23'
3/4"	6	13-19	23.0 kgs	24.0 kgs.	1.23'
7/8"	8	16-23	23.5 kgs.	24.5 kgs.	1.32'
1"	-	13-26	25.4 kgs.	26.4 kgs.	1.47'

HF - 2301 BUTTERFLY HOSE CLAMPS BAND WIDTH 12.7MM					
SIZE	NO.	MM	NW	GW	CU FT
3/4"	6	13-19	22.5 kgs	23.5 kgs.	1.23'
7/8"	8	16-23	23.0 kgs	24.0 kgs.	1.23'
1 1/16"	10	19-27	23.0 kgs	24.5 kgs.	1.32'
1 3/16"	-	19-30	23.5 kgs	24.5 kgs.	1.47'
1 1/4"	12	16-32	24.0 kgs.	25.0 kgs.	1.47'
1 3/8"	-	23-36	26.6 kgs	28.1 kgs.	1.94'
1 1/2"	16	21-38	28.0 kgs	29.5 kgs.	1.94'
1 5/8"	-	19-42	28.2 kgs	29.7 kgs.	2.36'
1 3/4"	20	19-44	29.5 kgs	31.0 kgs.	2.36'
1 7/8"	-	29-47	15.6 kgs.	16.6 kgs.	1.47'
2"	24	32-51	16.0 kgs.	17.0 kgs.	1.47'

CLAMPS/DUCT FIXING

HEAVY DUTY ELECTRO GALVANIZED PIPE CLAMPS

Welded Dual Nuts M8 + M10 with Poze screw without Rubber



TUBE SIZE AVAILABLE	CLIP SIZE
3/8"	15-19
1/2"	20-25
3/4"	26-30
1"	32-36
1 1/4"	38-43
1 1/2"	47-51
54mm	53-58
2"	60-64
70mm	67-72
2 1/2"	75-80
3"	87-92
110mm	107-112
4"	113-118
5"	138-142
6"	159-166

HEAVY DUTY ELECTRO GALVANIZED PIPE CLAMPS WELDED

DUAL NUT M8 + M10 with Pozi screw with EPDM Rubber lining



TUBE SIZE AVAILABLE	CLIP SIZE
3/8"	15-19
1/2"	20-25
3/4"	26-30
1"	32-36
1 1/4"	38-43
1 1/2"	47-51
54mm	53-58
2"	60-64
70mm	67-72
2 1/2"	75-80
3"	87-92
110mm	107-112
4"	113-118
5"	138-142
6"	159-166

CLAMPS/DUCT FIXING

RAPID CLAMP ELECTRO GALVANIZED with DUAL NUT
M8 + M10 with EPDM Rubber lining



TUBE SIZE AVAILABLE	CLIP SIZE
3/8"	15-19
1/2"	20-25
3/4"	26-30
1"	33-35
1 1/4"	42-44
1 1/2"	48-50
2	60-64

BEAM CLAMP - Zinc Plated



HOLE	BOLT	WEIGHT	A	B	C	D	E
H	GRADE 8.8	Recommended					
M6	8 x 35	235 kg.	35	19	38	35	19
M8	8 x 35	235 kg.	35	19	38	35	19
M6	10 x 40	235 kg.	45	25	50	41	21
M8	10 x 40	235 kg.	45	25	50	41	21
M10	10 x 40	235 kg.	45	25	50	41	21
7mm	8 x 35	236 kg.	35	19	38	35	19
9mm	8 x 35	237 kg.	35	19	38	35	19
7mm	10 x 40	238 kg.	45	25	50	41	21
9mm	10 x 40	239 kg.	45	25	50	41	21
11mm	10 x 40	240 kg.	45	25	50	41	21

CLAMPS/DUCT FIXING

PURLIN CLAMP - Zinc Plated



HOLE H	SHEET SIZE MM
9MM	159 x 25 x 3
11MM	159 x 25 x 3
13MM	159 x 25 x 3

STRUT CLAMP - Zinc Plated



TUBE Size	CLAMP SIZE	SHEET SIZE	BOLT
1/2"	15 MM	1.6 x 32MM	M6 x 25
3/4"	20 MM	1.6 x 32MM	M6 x 25
1"	25 MM	1.9 x 32MM	M8 x 35
1 1/4"	32 MM	1.9 x 32MM	M8 x 35
1 1/2"	40 MM	1.9 x 32MM	M8 x 35
2"	50 MM	1.9 x 32MM	M8 x 35
2 1/4"	65 MM	1.9 x 32MM	M8 x 35
3"	80 MM	3.0 x 32MM	M10 x 35
4"	100 MM	3.0 x 32MM	M10 x 35
5"	125 MM	3.0 x 32MM	M10 x 35
6"	150 MM	3.0 x 32MM	M10 x 35

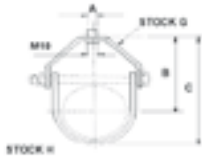
BACK PLATE with DUAL NUT M8 + M10 ELECTRO GALVANIZED



LENGTH	WIDTH	THICKNESS
78MM	20MM	2MM

CLAMPS/DUCT FIXING

DUCT FIX - CLEVIS HANGER



Ø SIZE AVAILABLE	PIPE	ROD SIZE - A	CENTER LINE - B	HEIGHT C	CROSS BOLT	STOCK		MAX. LOAD
						G	H	KGS.
1/2"	20-25	3/8"	44	55	1/4"	3 x 25	3 x 25	270
3/4"	26-30	3/8"	54	68	1/4"	3 x 25	3 x 25	270
1"	32-36	3/8"	58	75	1/4"	3 x 25	3 x 25	270
1-1/4"	38-43	3/8"	80	100	1/4"	3 x 25	3 x 25	270
1-1/2"	47-51	3/8"	81	106	1/4"	3 x 25	3 x 25	270
2"	60-64	3/8"	86	117	1/4"	3 x 25	3 x 25	270
2-1/2"	75-80	1/2"	106	144	5/16"	3 x 32	3 x 32	500
3"	87-92	1/2"	127	172	5/16"	3 x 32	3 x 32	500
4"	113-118	5/8"	141	199	3/8"	4 x 32	3 x 32	640
5"	138-142	5/8"	159	229	3/8"	4 x 32	3 x 32	640
6"	159-166	3/4"	174	257	1/2"	4 x 38	3 x 38	800
8"	207-219	7/8"	212	320	5/8"	5 x 45	4 x 45	900
10"	260-273	7/8"	250	387	5/8"	6 x 45	5 x 45	1600
12"	309-323	7/8"	292	457	5/8"	6 x 50	5 x 50	1700

PIPE HANGER - Adjustable Swivel Ring / Pear Clamp ZINC PLATED with KNURLED NUT



TUBE SIZE AVAILABLE INCHES	Ø SIZE (MM)	H SIZE (MM)	SHEET SIZE MM
3/4"	20	64	1.5 x 25
1	25	72	1.5 x 25
1 1/4"	32	83	1.5 x 25
1-1/2"	40	96	1.5 x 25
2	50	113	1.5 x 25
2 1/2"	65	132	20 x 25
3	80	156	20 x 25
4	100	215	20 x 25
5	125	242	2.5 x 25
6	150	279	2.5 x 25



AUTOMOTIVE FASTENERS

CONTENTS

273 FASTENER FOR TUBES, RODS,
CABLES and LAYOUTS



274 FASTENER FOR TUBES, RODS, CABLES and LAYOUTS
Material ; Treated spring steel



275 FASTENER FOR PANELS
Closing systems, small model



276 FASTENER FOR TUBES, RODS,
CABLES and LAYOUTS



277 FASTENER FOR PANELS
CLIP-ON Closing system



278 FASTENER FOR PANELS
Closing systems, large model



279 FASTENER FOR PANELS
CLIP-ON Closing system



280 FASTENER for PANELS
Single snap - on fasteners



280 FASTENER for PANELS
Double snap - on fasteners



AUTOMOTIVE FASTENERS

FASTENER FOR TUBES, RODS, CABLES and LAYOUTS

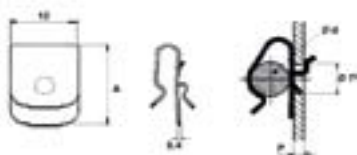


Cable and tube fasteners
for insertion in mid-panel

Recommended use:

This type of fastener is installed simply by clipping it into a round or square punched hole and provides an elastic fixing for wires, cables, tubes and piping.

TYPE 1



Ø d (Diameter)	P = PANEL THICKNESS	A
4 to 6	0.4 to 0.7	21.2
4 to 6	0.8 to 1.2	21.2
4 to 6	1.3 to 1.7	21.2
7 to 9	0.4 to 0.7	19.5
7 to 9	0.8 to 1.2	19.5
7 to 9	1.3 to 1.7	19.5
7 to 9	1.8 to 2.2	19.5
10 to 12	0.4 to 0.7	18.4
10 to 12	0.8 to 1.2	18.4
10 to 12	1.3 to 1.7	18.4
10 to 12	1.8 to 2.2	18.4
5 to 7	0.8 to 1.2	21.2
5 to 7	1.3 to 1.7	21.2
5 to 7	1.8 to 2.2	21.2

TYPE 2



Ø d (Diameter)	P = PANEL THICKNESS	A	H	e	Ø F
3	0.8 to 1.4	20	21.2	0.6	7.3
	1.5 to 2				7.6
4.7 to 5	0.8 to 1.4	21	21.2	0.6	7.3
	1.5 to 2				7.6
8 to 8.5	0.8 to 1.3	22	24	0.8	7.3
	1.4 to 2				7.6
11 to 11.5	0.8 to 1.3	30	28	1	7.3
	1.4 to 2				7.6

AUTOMOTIVE FASTENERS

FASTENER FOR TUBES, RODS, CABLES and LAYOUTS

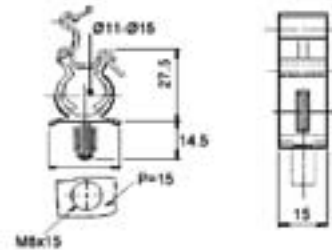
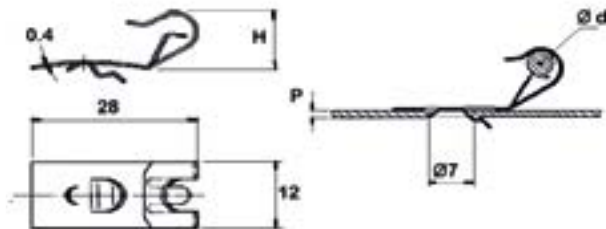
Material ; Treated spring steel



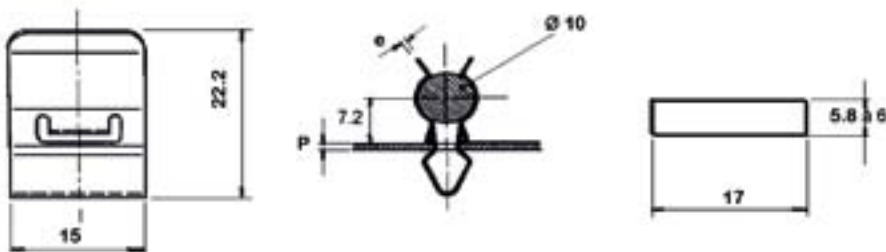
Ø d (Diameter)	P = PANEL THICKNESS	H
3 to 4	0.8 to 1.2	10.6
3 to 4	1.3 to 1.7	10.6
4 to 6	0.8 to 1.2	10
4 to 6	1.3 to 1.7	10

TYPE 3

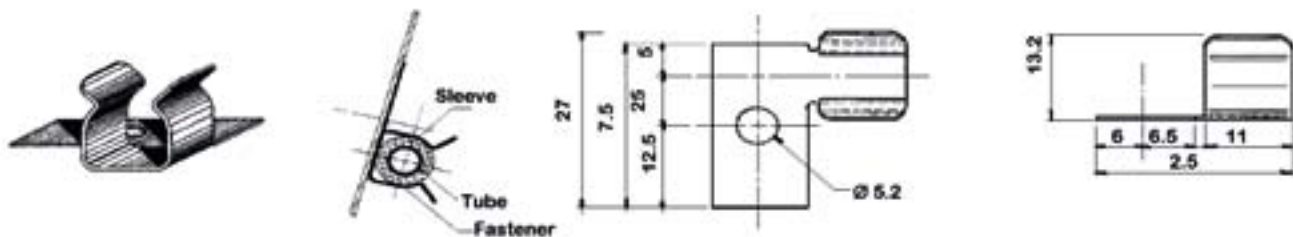
TYPE 4



TYPE 3



TYPE 3



Recommended assembly method;

1. Position the fastener on the panel.
2. Insert the fastener in the substrate with the aid of the simple tool.
3. Once in position, the fastener is self-retaining.

AUTOMOTIVE FASTENERS

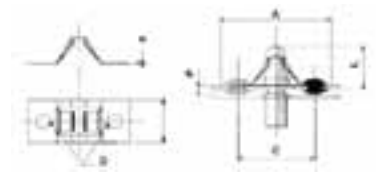
FASTENER FOR PANELS Closing systems, small model



Recommended use:

This system consist of a stud that clips into a fastener formed by spring blades, The fasteners are screwed or riveted to their substrate. The fastener is opened and closed simply by pulling or pressing. The insertion and extraction forces depend on the material thickness of the fastener.

FASTENER:
Material - Treated spring steel



REFERENCE	A*	B	C*	D	e	Ø F min.	Average INSERTION FORCE** (DaN)	Average EXTRACTION FORCE** (DaN)
MF 410	26	12	18	3.2	0.3	7.2	15	2
MF 411	26	12	18	3.2	0.4	7.2	2.5	3
MF 412	26	12	18	3.2	0.5	7.2	4	5
MF 413	26	12	18	3.2	0.6	7.2	6	8
MF 414	26	12	18	3.2	0.7	7.2	7.5	12
MF 415	26	12	18	3.2	0.8	7.2	9	15

STUD
Material : STEEL



Ø d (Diameter)	L	G	P = Panel THICKNESS
4.2 metal /wood screw type	11.4	8	0.9 to 1.4
M3 tapped	12	10	1.5 to 2.1
M5 threaded	12.7	4.5	2.2 to 3
4.2 metal /wood screw type	13.4	8	2.5 to 3.8
M5 threaded	14	10	3.1 to 4.1
M4 threaded	15	7	4.2 to 5.2
M5 threaded	18	10	7.2 to 8.2

MATERIAL	FASTENER	STUD
	Treated spring steel	Steel
SURFACE TREATMENT	Phosphating + paint	Zinc plating
COLOUR	BLACK	Steel

AUTOMOTIVE FASTENERS

FASTENER FOR TUBES, RODS, CABLES and LAYOUTS



Cable and tube fasteners for
fixing to panel edges

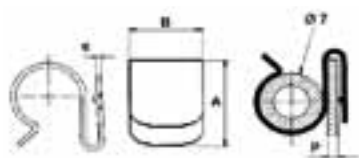
Recommended use:

This type of fastener holds cables and tubes and is designed to clamp the edge of a panel or cornice. The fastener is retained in position by the teeth or tabs of the clip, depending on the model.

TYPE 1

TYPE 2

SHAPES



Ø d (Diameter)	P = PANEL THICKNESS	A	B	e	TYPE
10 to 14	0.7 to 2.1	20	14	0.6	1b
22 to 26	0.8 to 1.2	27	14	0.6	1c
12	0.8 to 1.2	11	14	0.6	1d
5	0.8 to 2	11.6	10	0.4	1d
2 to 2.5 x 2	0.8 to 2.2	8.5	10	0.3	1e
7	1.2 to 2.2	9	12	0.5	2a
2 to 2.5 x 2	2 to 3	9	10	0.3	1e

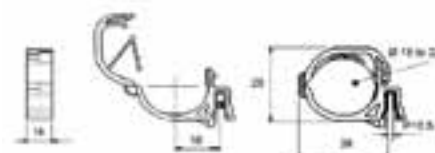
TYPE 3 - STAINLESS STEEL



Recommended assembly:

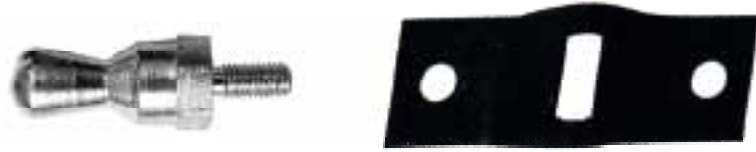
1. Position the clip at the edge of the panel.
2. Clamp the clip to the substrate by hand or with the aid of a simple tool.
3. Once clipped into position, the clip is self-retaining.

TYPE 4 - STAINLESS STEEL



AUTOMOTIVE FASTENERS

FASTENER FOR PANELS Closing systems, large model

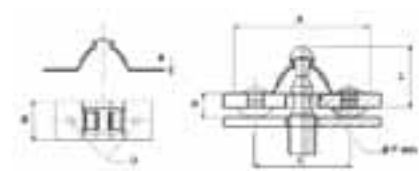


Recommended use:

This system consist of a stud that clips into a fastener composed of spring blades. The fasteners are screwed or riveted to their substrate. The fastener is opened and closed and closed by simple pulling or pressing force.

FASTENER:

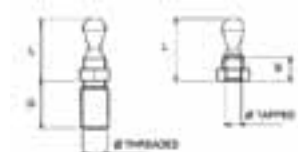
Material - Treated spring steel



REFERENCE	A*	B	C*	D	e	Ø F min.	Average INSERTION FORCE** (DaN)	Average EXTRACTION FORCE** (DaN)
MF 402 - 4 - 52	51	18	38	5	0.4	10.5	2.5	2.5
MF 402 - 5 - 52	51	18	38	5	0.5	10.5	5	5
MF 402 - 6 - 52	51	18	38	5	0.6	10.5	10	10
MF 402 - 7 - 52	51	18	38	5	0.7	10.5	15	15

STUD

Material : STEEL



Ø d (Diameter)	L	G	P = Panel THICKNESS
M4 threaded	25	10	1.5 to 5
M6 threaded	25	10	1.5 to 5
M5 threaded	27.4	7	4 to 7.5

	FASTENER	STUD
MATERIAL	Treated spring steel	Steel
SURFACE TREATMENT	Phosphating + paint	Zinc plating
COLOUR	BLACK	White

AUTOMOTIVE FASTENERS

FASTENER FOR PANELS CLIP-ON Closing system

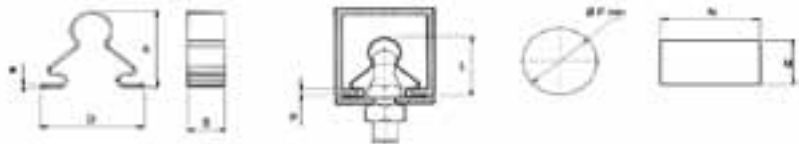


Recommended use:

This systems, which require very little space, consist of a stud that clip into a spring fastener. The fasteners are fitted to the support from the outside and automatically lock in position. The system is opened and closed by simple pulling or pressing force.

FASTENER:

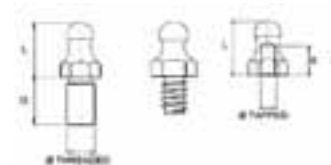
Material - Treated spring steel



REFERENCE	A	B	D*	e	Ø F min.	M	N	Average INSERTION FORCE** (DaN)	Average EXTRACTION FORCE** (DaN)
MF 410	13.4	6	16.5	0.4	10.5	7	9	9	8
MF 411	13.8	6	16.5	0.4	10.5	7	9	8	8
MF 412	13.8	8	15.2	0.4	11.4	8.3	8	18	14
MF 413	14.2	6	16.4	0.4	10.5	7	9	8	8
MF 414	14.6	6	16.3	0.4	10.5	7	9	7	7
MF 415	15.8	6	16.7	0.4	10.5	7	9	7	7

STUD

Material : STEEL



Ø d (Diameter)	L	G	P = Panel THICKNESS
4.2 metal screw type	11.4	8	0.5 to 0.8
M5 threaded	12	10	0.9 to 1.2
M4 threaded	12.7	5	1.3 to 1.6
M5 threaded	12.7	10	1.3 to 1.6
M3 threaded	12.7	10	1.7 to 2
M3 tapped	12.7	4.5	1.7 to 2
M4 threaded	12.7	5	1.7 to 2
M5 threaded	14	10	2.9 to 3.2

FASTENER		STUD
MATERIAL	Treated spring steel	Steel
SURFACE TREATMENT	Phosphating + paint	Zinc plating
COLOUR	BLACK	White

AUTOMOTIVE FASTENERS

FASTENER FOR PANELS CLIP-ON Closing system

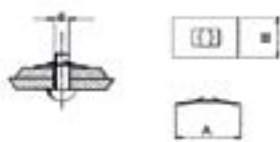
Recommended use:

This systems, which require very little space, consist of a stud that clip into a spring fastener. The fasteners are fitted to the support from the outside and automatically lock in position.

The system is opened and closed by simple pulling or pressing force.



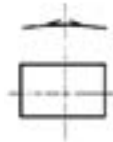
TYPE 1 : 2-TAB



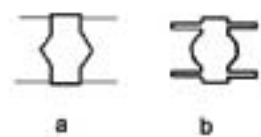
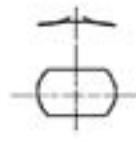
SHAPE 1



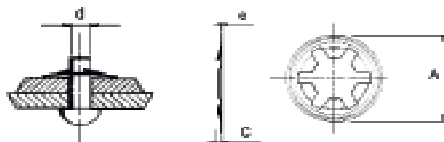
SHAPE 2



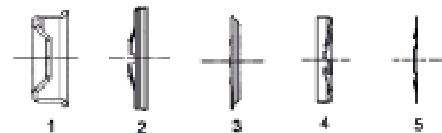
SHAPE 3



TYPE 2; MULTI-TAB



SHAPES

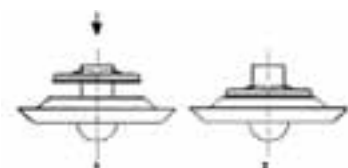


Ø d (Diameter)	A	B	C	e	TYPE	SHAPE
2	15	8		0.3	1	2a
2.5	15	8		0.3	1	2a
2.5	6		1.5	0.25	2	1
3	9			0.3	1	1a
3.5	9			0.3	1	1a
4	14.2	9.5		0.35	1	2a
4	18	10		0.4	1	2a
4	12			0.4	1	1a
4	12			0.4	1	1a
4	10.5			0.4	1	1a
4	11		1.6	0.2	2	4
5	11.6		1.6	0.3	2	4
5	15			0.4	1	1a
6x2	18	10	3	0.3	1	2a
6	18			0.5	1	1b
6	15			0.4	1	1a
8	15		1.2	0.3	2	3
8	22		3	0.3	2	2
10	23.5			0.5	1	1a
12	22		1.4	0.5	2	5
14	34.3		4	0.4	2	4
16	28	22		0.4	1	3b
20	28.6		1.5	0.4	2	2

WASHER	
MATERIAL	Treated spring steel
SURFACE TREATMENT	Phosphating Stainless steel
COLOUR	BLACK

Recommended assembly method:

1. Manually pre-position the "fixed" washer at the end of the shaft, which should preferably be chamfered.
2. Press home the "fixed" washer with the aid of a simple tool.



AUTOMOTIVE FASTENERS

FASTENER for PANELS Single snap - on fasteners

Recommended use:

These are mainly used to fix trim panels. They can also be used as temporary fastening. They are suitable for assemblies exposed to low mechanical stress.



FASTENER:

Material - Treated spring steel



SHAPES



Recommended assembly method:

1. Fill the fastener manually by pushing it over the edge of the panel. On thick panels, a simple tool necessary.

P = Panel Thickness	A	B	e	SHAPE
0.7	16.5	12	0.7	e
0.8 to 1.8	8.5	12	0.4	c
1.5 to 2.5	7	4	0.4	b
1.5 to 3	15.7	12.7	0.6	b
1.6 to 2.4	8.2	12	0.4	c
2 to 2.5	7	4	0.4	b
2.5 to 3	16.1	20.2	0.5	c
2.5 to 3	13	12	0.4	e
2.5 to 3	8.3	12	0.4	e
2.5 to 4	9.6	13	0.3	b
3 to 4	13	13	0.4	e
3.5 to 3.8	15	10	0.5	d
3.5 to 5	11	12	0.4	c
5.3 to 6.3	11	12	0.5	c
5.5 to 6.5	11	12	0.4	c
6	11	12	0.5	d

FASTENER for PANELS Double snap - on fasteners

Recommended use:

These fasteners are mainly used to join panels end to end.

They provide an advantageous alternative to screwed fasteners. They are easy to dismantle and reuse.



FASTENER:

Material - Treated spring steel



P1 = Panel Thickness	P2 = Panel Thickness	A	B	e	SHAPE VARIANT
0.7 to 2.5	0.7 to 2.5	17.7	20	0.7	c
0.8 to 1.5	0.8 to 1.5	13.2	13	0.5	a
0.8 to 2.3	0.8 to 2.3	10	12	0.4	b
1 to 1.5	1.8 to 2.5	13	9	0.6	c
1.7 to 1.8	3.8	15.6	15	0.6	c
1.8	2.4	11.6	15	0.6	b
2	2	14.6	12	0.6	b
2 to 3.2	0.6 to 0.8	9.4	12	0.5	d
2 to 3.2	1.9 to 2.3	10	12	0.5	d
2 to 3	2.5	19.5	15	0.5	b
2.3 to 2.7	0.8	18	25	0.6	c
2.5	9	16	14	0.5	c

Recommended assembly method:

1. Position the fastener at the edge of the panel.
2. Fit the two pinching sections of the double fastener over the two panels using a simple tool.
3. Once correctly fitted in position the fastener is self-retaining.



MISCELLANEOUS

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LIFTING EYE NUTS - Steel Zinc Plated and Yellow Plated



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WELDLESS EYE NUT AUTO BLACK - HDG



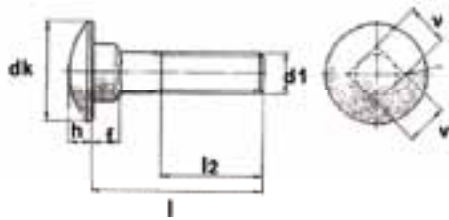
287

U-BOLT ELECTRO GALVANIZED with TWO NUTS



MISCELLANEOUS

MUSHROOM HEAD SQUARE NECK BOLTS Steel and Steel Zinc Plated



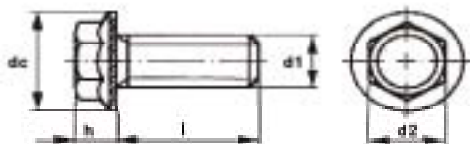
ISO : 8677
DIN : 603
ANSI : -
BS : -



d1	M6	M8	M10	M12	M16
P	1	1.25	1.5	1.75	2
l2	18	22	26	30	38
dk	16.55	20.65	24.65	30.65	38.8
f	4.6	5.6	6.6	8.75	12.9
h	3.88	4.88	5.38	6.95	8.95
V	6.48	8.58	10.58	12.7	16.7

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M6 x 16	M6 x 45	M8 x 30	M8 x 60	M10 x 30	M10 x 60	M12 x 25	M12 x 50	M12 x 80
M6 x 20	M6 x 50	M8 x 35	M8 x 70	M10 x 35	M10 x 70	M12 x 30	M12 x 55	M12 x 90
M6 x 25		M8 x 40	M8 x 80	M10 x 40	M10 x 80	M12 x 35	M12 x 60	M12 x 100
M6 x 30	M8 x 16	M8 x 45		M10 x 45	M10 x 90	M12 x 40	M12 x 65	
M6 x 35	M8 x 20	M8 x 50	M10 x 20	M10 x 50	M10 x 100	M12 x 45	M12 x 70	M16 x 90
M6 x 40	M8 x 25	M8 x 55	M10 x 25	M10 x 55			M12 x 75	M16 x 120

TENSILOCK-SELF LOCKING HEXAGON FLANGE BOLTS Steel Full Threaded - Steel 241 and Zinc Plated



ISO : -
DIN : - 6921
ANSI : B18.3.4M
BS : -

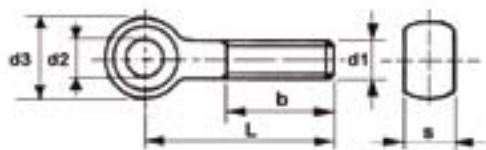


d1	M5	M6	M8	M10	M12 2	M16 2
P	0.8	1	1.25	1.5	1.75	2
h	4.3	5.5	7	8.5	10	14
d2	8	10	13	15	17	22
dc	11.2	14.2	18.2	21	24	31

SIZE AVAILABLE								
d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l	d1 x l
M5 x 10	M6 x 10	M6 x 25	M8 x 20	M10 x 16	M10 x 40	M12 x 35	M16 x 25	M16 x 50
M5 x 12	M6 x 12	M6 x 30	M8 x 25	M10 x 20		M12 x 40	M16 x 30	M16 x 55
M5 x 16	M6 x 16		M8 x 30	M10 x 25	M12 x 20	M12 x 45	M16 x 35	M16 x 60
M5 x 20	M6 x 20	M8 x 12	M8 x 35	M10 x 30	M12 x 25	M12 x 50	M16 x 40	M16 x 70
		M8 x 16	M8 x 40	M10 x 35	M12 x 30		M16 x 45	

MISCELLANEOUS

EYE BOLTS - Steel



ISO : -
 DIN : 444 B
 NEN : 2310 B
 ANSI : -
 BS : -
 NF : -

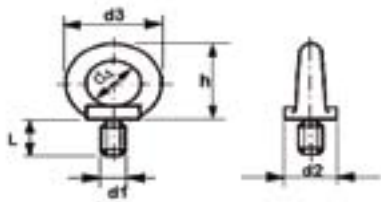


d1	M6	M8	M10	M12	M16	M20	M24	M27	M30
P	1	1.25	1.5	1.75	2	2.5	3	3	3.5
b [⊙]	18	22	26	30	38	46	54	60	66
b [⊙]	-	28	32	36	44	52	60	66	72
b [⊙]	-	-	-	49	57	65	73	79	85
d2 (H9)	6	8	10	12	16	18	22	25	28
d3 (max.)	14	18	20	25	32	40	45	50	55
s (max.)	7	9	12	14	17	22	25	27	30

SIZE AVAILABLE		
d1 x L	d1 x L	d1 x L
M3 x 30	M12 x 60	M20 x 130
M3 x 40	M12 x 70	M20 x 140
M3 x 50	M12 x 80	M20 x 150
M3 x 60	M12 x 90	M20 x 160
M3 x 70	M12 x 100	M20 x 180
M3 x 80	M12 x 110	M20 x 200
	M12 x 120	
M8 x 40	M12 x 130	M24 x 100
M8 x 50	M12 x 140	M24 x 110
M8 x 60	M12 x 150	M24 x 120
M8 x 70		M24 x 130
M8 x 80	M16 x 60	M24 x 140
M8 x 90	M16 x 70	M24 x 150
M8 x 100	M16 x 80	M24 x 160
M8 x 110	M16 x 90	M24 x 180
M8 x 120	M16 x 100	M24 x 200
M8 x 130	M16 x 110	M24 x 220
M8 x 140	M16 x 120	
	M16 x 130	M27 x 120
M10 x 40	M16 x 140	M27 x 140
M10 x 50	M16 x 150	M27 x 160
M10 x 60	M16 x 160	M27 x 180
M10 x 70	M16 x 180	M27 x 200
M10 x 80	M16 x 200	
M10 x 90		M30 x 120
M10 x 100	M20 x 60	M30 x 140
M10 x 110	M20 x 60	M30 x 160
M10 x 120	M20 x 60	M30 x 180
M10 x 130	M20 x 60	M30 x 200
M10 x 140	M20 x 60	

MISCELLANEOUS

LIFTING EYE BOLTS - Steel Zinc Plated and Yellow Plated



ISO	:	3266
DIN	:	580
NEN	:	1927
ANSI	:	-
BS	:	4278
NF	:	-



d1	M6	M8	M10	M12	M14	M16	M20	M22	M24	M27	M30
P	1	1.25	1.5	1.75	2	2	2.5	2.5	3	3	3.5
d2	20	20	25	30	35	36	40	45	50	50	65
d3	36	36	45	54	63	63	72	81	90	90	108
d4	20	20	25	30	35	35	40	45	50	50	60
h	36	36	45	53	62	62	71	81	90	90	109
L	13	13	17	20.5	27	27	30	35	36	38	45

TOTAL MAXIMUM LOAD DUE TO SUSPENDED ITEM IN NEWTON (N)													
DIRECTION OF LOAD	one bolt		750	1400	2300	3400	4850	7000	12000	15200	18000	26000	36000
	two bolts		500	950	1700	2400	3400	5000	8300	10500	12700	18700	28000

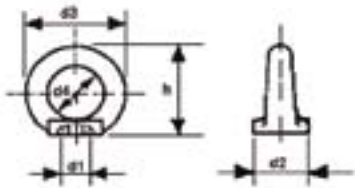
d1	M33	M36	M39	M42	M45	M48	M52	M56	M64	M72
P	3.5	4	7	4.5	4.5	5	5	5.5	6	6
d2	65	75	75	85	85	100	110	110	120	150
d3	108	126	126	144	144	166	184	184	206	260
d4	60	70	70	80	80	90	100	100	110	140
h	109	128	128	147	147	168	187	187	208	260
L	45	54	54	63	63	68	78	78	90	100

TOTAL MAXIMUM LOAD DUE TO SUSPENDED ITEM IN NEWTON (N)												
DIRECTION OF LOAD	one bolt		43000	51000	60000	70000	78000	86000	95000	115000	160000	210000
	two bolts		31000	37000	43000	50000	54000	61000	70000	83000	110000	150000

SIZE AVAILABLE		
d1	d1	d1
M6	M22	M42
M8	M24	M45
M10	M27	M48
M12	M30	M52
M14	M33	M56
M16	M36	M64
M20	M39	M72 x 6

MISCELLANEOUS

LIFTING EYE NUTS - Steel Zinc Plated and Yellow Plated



ISO : -
DIN : 582
NEN : 1928
ANSI : -
BS : -
NF : -



d1	M6	M8	M10	M12	M14	M16	M20	M22	M24	M27
P	1	1.25	1.5	1.75	2	2	2.5	2.5	3	3
d2	20	20	25	30	30	36	40	45	50	50
d3	36	36	45	54	54	63	72	81	90	90
d4	20	20	25	30	30	35	40	45	50	50
h	36	36	45	53	53	62	71	81	90	90

TOTAL MAXIMUM LOAD DUE TO SUSPENDED ITEM IN NEWTON (N)												
DIRECTION OF LOAD	one bolt		750	1400	2300	3400	4850	7000	12000	15200	18000	26000
	two bolts		500	950	1700	2400	3400	5000	8300	10500	12700	18700

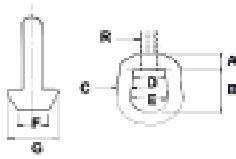
d1	M27	M30	M33	M36	M39	M42	M48	M56	M64	M72
P	3	3.5	3.5	4	4	4.5	5	5.5	6	6
d2	50	65	65	75	75	85	100	110	120	150
d3	90	108	108	126	126	144	166	184	206	260
d4	50	60	60	70	70	80	90	100	110	140
h	90	109	109	128	128	147	168	187	208	260

TOTAL MAXIMUM LOAD DUE TO SUSPENDED ITEM IN NEWTON (N)												
DIRECTION OF LOAD	one bolt		26000	36000	43000	61000	60000	70000	86000	115000	160000	210000
	two bolts		18700	26000	31000	37000	43000	50000	61000	83000	110000	150000

SIZE AVAILABLE		
d1	d1	d1
M6	M22	M42
M8	M24	M48
M10	M27	M52
M12	M30	
		M56
M14	M33	M64
M16	M36	M72 x 6
M20	M39	

MISCELLANEOUS

WELDLESS EYE NUT AUTO BLACK - HDG

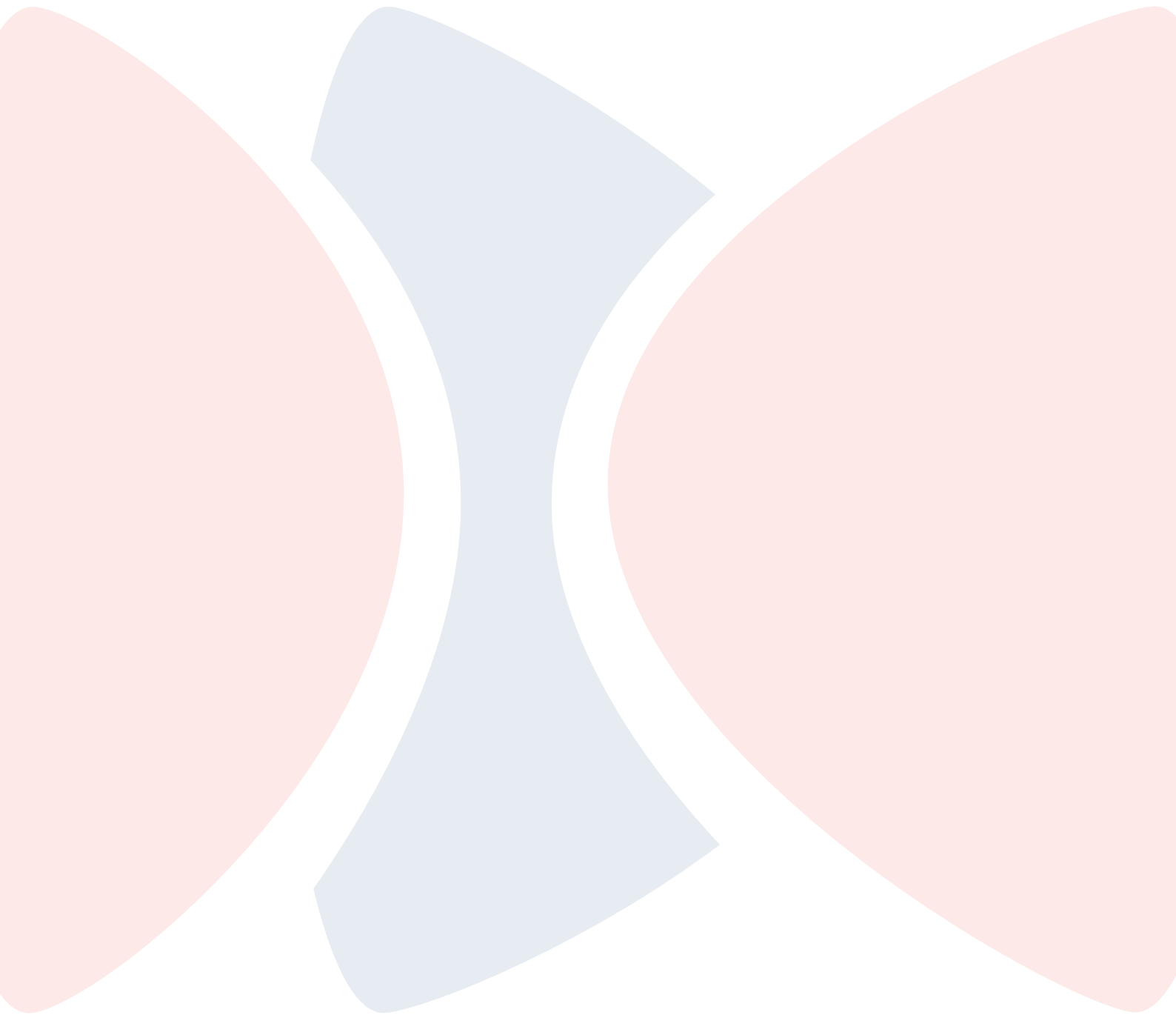


SIZE AVAILABLE							
R	A	B	C	D	E	F	G
3/8"	20	52	13	32	38	25	34.5
1/2"	20	52	13	32	38	25	34.5
5/8"	20	52	13	32	38	25	34.5
3/4"	20	52	13	32	38	25	34.5
7/8"	26	66.7	19	42.9	50	31	50
1"	26	66.7	19	42.9	50	31	50
1 1/8"	32	86	25.4	57	63.5	47	62
1 1/4"	32	86	25.4	57	63.5	47	62
1 1/2"	32	86	25.4	57	63.5	47	62

U-BOLT ELECTRO GALVANIZED with TWO NUTS



SIZE AVAILABLE	A	B	C
M6 x 1/2"	17.3	39.3	20
M6 x 5/8"	21.7	41.7	20
M6 x 3/4"	27.2	47.2	20
M6 x 1"	34.0	54.0	20
M6 x 1 1/4"	42.7	62.7	20
M6 x 1 1/2"	48.6	68.6	20
M6 x 2"	60.5	80.5	20
M6 x 2 1/2"	77.0	97.0	20
M6 x 3"	90.0	111.0	20
M8 x 1/2"	17.3	42.3	25
M8 x 5/8"	21.7	46.7	25
M8 x 3/4"	27.2	52.2	25
M8 x 1"	34.0	59.0	25
M8 x 1 1/4"	42.7	67.7	25
M8 x 1 1/2"	48.6	73.6	25
M8 x 2"	60.5	85.5	25
M8 x 2 1/2"	77.0	102.0	25
M8 x 3"	90.0	116.0	25
M8 x 4"	116.0	140.0	25
M10 x 1/2"	17.3	47.3	30
M10 x 5/8"	21.7	51.7	30
M10 x 3/4"	27.2	57.2	30
M10 x 1"	34.0	64.0	30
M10 x 1 1/4"	42.7	72.7	30
M10 x 1 1/2"	48.6	78.6	30
M10 x 2"	60.5	90.5	30
M10 x 2 1/2"	77.0	107.0	30
M10 x 3"	90.0	121.0	30
M10 x 4"	116.0	145.0	30
M10 x 5"	142.0	175.0	30
M10 x 6"	170.0	198.0	30
M12 x 2"	60.5	101.0	35
M12 x 2 1/2"	77.0	117.0	35
M12 x 3"	90.0	129.0	35
M12 x 4"	116.0	145.0	35
M12 x 5"	142.0	159.0	35
M12 x 6"	170.0	182.0	35
M12 x 8"	220.0	248.0	35
M12 x 10"	270.0	300.0	35
M12 x 12"	320.0	354.0	35



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LOCATION	PHONE	FAX	MOBILE
Head Office - Riyadh	966 1 4489999	966 1 4460385	
International Branches - Dubai	971 4 3235367	971 4 3235368	971 556089224
Abu Dhabi	971 2 5535373	971 2 5535374	
Tool Number - KSA	92 000 2838		
Central Region Sales Office - RIYADH	966 1 2418624	966 1 2700928	966 558844092
Eastern Region Sales Office - Dammam	966 3 8188444	966 3 8190980	966 504784963
Western Region Sales Office - JEDDAH	966 2 6491666	966 2 6496099	966 556223033
Riyadh Showroom (Old Sinaiyah)	966 1 4489999	966 1 4460385	966 500905246
Riyadh Showroom (Owaidah)	966 1 4470240	966 1 2044530	966 565027220
Riyadh Showroom (Rail Street)	966 1 4041579	966 1 4042045	966 553171726
Jeddah Showroom (Mekkah Road)	966 2 6020222	966 2 6870360	966 508005759
Jeddah Showroom (Alnuzha)	966 2 6121000	966 2 6545599	
Jeddah Showroom (Albalad)	966 2 6491666	966 2 6496099	
Qassim Showroom	966 6 3278899	966 6 3278800	966 500822744
Dammam Showroom (King Saud St.)	966 3 8375010	966 3 8375060	966 505268750
Dammam Showroom (Aladamah)	966 3 8338750	966 3 8338750	966 508897873
Dammam Showroom (City Center)	966 3 8328888	966 3 8311888	
Jubail Showroom	966 3 3635377	966 3 3610421	966 542615589
Madinah Showroom	966 4 8647777	966 4 8489565	966 506532802
Abha Showroom	966 7 2207072	966 7 2234911	966 507684690
Yanbu Showroom	966 4 3903311	966 4 3903389	966 562423917