



BROOKS forgings
 the Manufacturing & Global Sourcing Specialists

Industrial Catalogue



ISO 9001



Approved



national highway sector schemes

Approved

BROOKS forgings
INDUSTRIAL CATALOGUE

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VER/001

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CONTENTS

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Manufacturer of Forged & Machined Components

Brooks Forgings Ltd, established in 1960, is one of the UK's leading manufacturers of Forged and Machined fastener components. With our extensive in-house manufacturing capabilities we are able to produce standards and specials to suit customer specific requirements.

Forging Capacity

At the heart of our manufacturing facility are 16 forging cells, each utilising the latest heating technology. Capable of forging from 10mm diameter up to 100mm diameter and lengths up to 6000mm.

In-house CAD/CAM and tool making capabilities enable us to manufacture specials and standard head forms on short lead times.



INTRODUCTION

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Manufacturing Capabilities

Our extensive range of manufacturing processes gives us the ability to supply to many different industry sectors.

By utilising our design department and the extensive knowledge at our disposal, we are able to offer a fully bespoke service.

Very few companies in the industry are able to provide the same extent of services under one roof



Counterblow Forging



Split Die Upset Forging



Closed Die Upset Forging



Drop Forging



Open Die Forging



Hand Forging



Hot & Cold Bending



Hot & Cold Pressing



Swaging & Pointing



Machining



Fabrication & Assembly



Flash Butt Welding



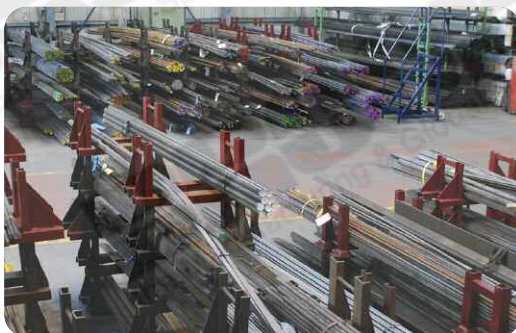
Die Sinking



Quality Control

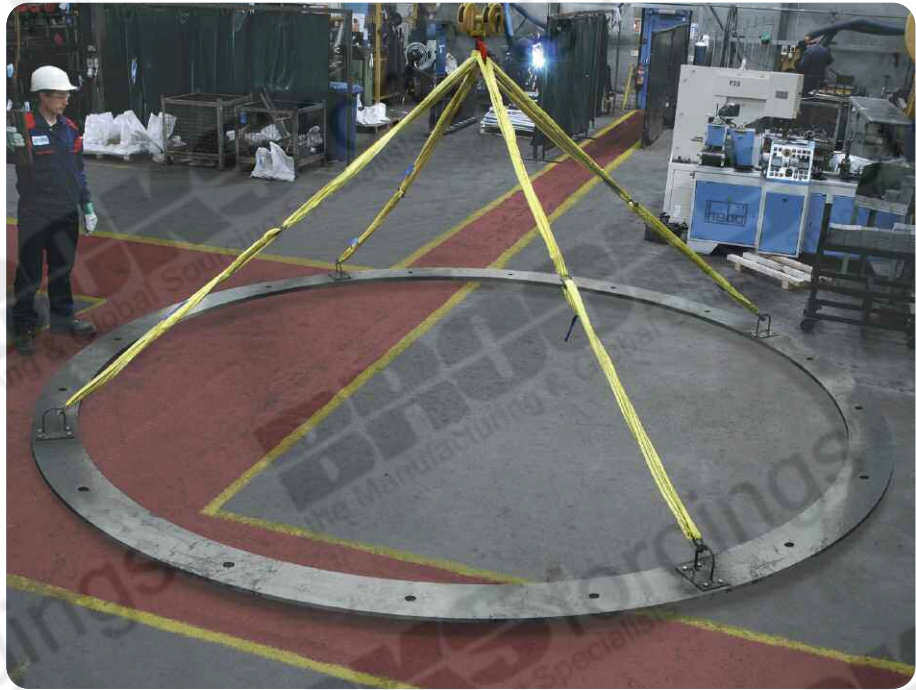


Warehousing



Material Stock for Production

Material stock is considered a valuable resource at Brooks Forgings. By having dedicated warehousing, holding over 250 tonnes of stock, we have the capacity to purchase material in larger more economical volumes, minimising the requirement for multiple deliveries from suppliers.



INTRODUCTION

Fabrication Capacity

Brooks Forgings can now assist you further with your fabrication requirements. Alongside traditional methods, we are able to offer Robot Welding and Flash Butt Welding as part of our standard service.

This gives us the flexibility to offer our customers the most cost effective method of fabrication.



ROBOT WELDING FLASH BUTT WELDING



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Machining Capacity

Our dedicated machining department specialises in the production of special and standard fasteners. We manufacture to national and international standards, customer drawings and component samples by reverse engineering.

A comprehensive CNC machining capacity gives us the ability to deal with low and high volume requirements and provides our customers' with consistent quality and accuracy.

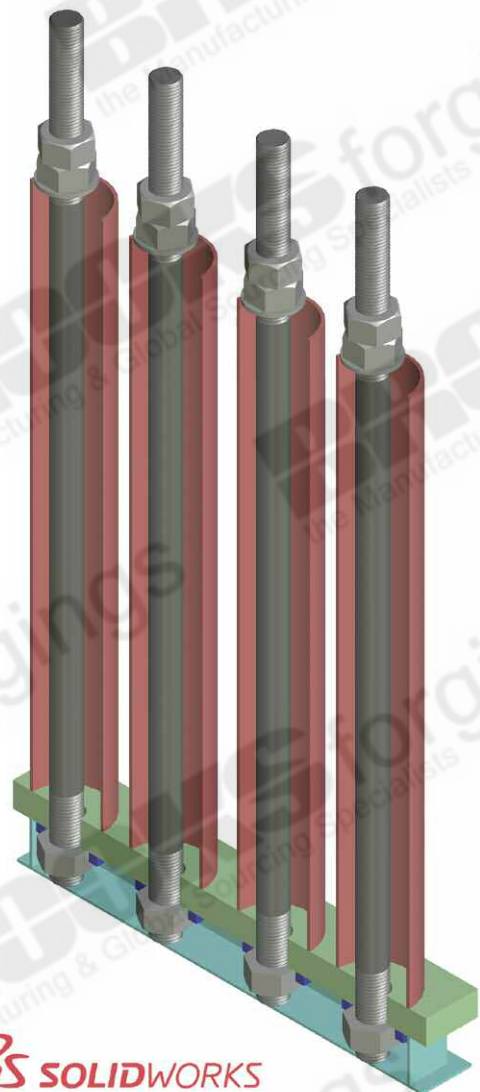
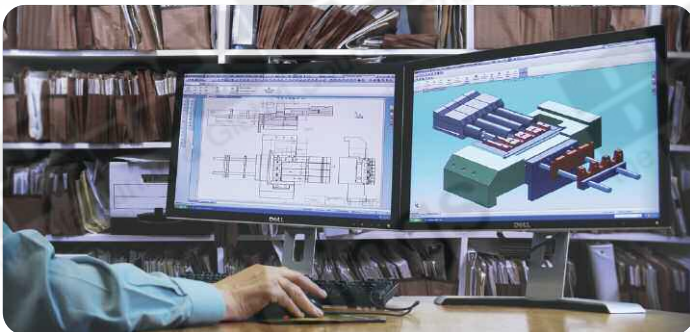
16 CNC MACHINES



CAD / CAM Design

Our CAD Design facility is an important department, enabling us to communicate ideas and information for various products and specifications.

We are able to review and break down customers supplied drawings into individual components, rendering new drawings for approval prior to manufacturing.



Quality Control

Our reputation for quality is underpinned by operating to BS EN ISO 9001, throughout all stages of production.

Component traceability is ensured by individual cast identification supported by all levels of certification. We offer Certificates of Conformity through to BS EN 10204 2.1, 2.2, 3.1 and independent inspection to BS EN 10204 3.2.

Quality plans, first article and dimensional inspection reports are available upon request.



Micro Percussion Marking System

We have both portable and benchtop micro-percussion marking systems. Commonly used for jobs requiring full traceability and unique component identification.

50 Tonne Destructive/Tensile Testing Machine

Mayer 4 Column Vertical Tensile Testing Machine. 500 KN model.

Portable CMM

The FARO Gage is a portable CMM that increases measurement productivity and flexibility and enhances accuracy in any production environment.

Brinell and Rockwell Hardness Testers

We have several on-site testing machines to measure the hardness of materials.

Coating Thickness Gauges

Our coating thickness gauge has an extensive range of features offering full batching and statistical capability. Measuring range up to 50 millimetres. High accuracy of up to $\pm 1\%$ when referred to reference standards.

Liquid Penetrant Inspection

Liquid penetrant inspection (LPI) is a commonly used inspection method to locate surface-breaking defects such as hairline cracks and surface porosity.

Cyclops Portable Thermometer

A general purpose, high temperature, portable infrared thermometer, designed for accurate measurement of temperatures in the range 550 to 3000°C/ 1022 to 5432°F.

Energy Dispersive X-Ray Fluorescence Analyser (EDXRF)

Hand held energy-dispersive x-ray fluorescence analyser. It can quickly, non-destructively, determine the elemental composition of metal and precious metal samples.

Inspection Jigs

Our in house tool room plays a vital part in assisting our quality control department.

Component inspection jigs can be produced ensuring 100% dimensional checks throughout production.



Quality Documentation

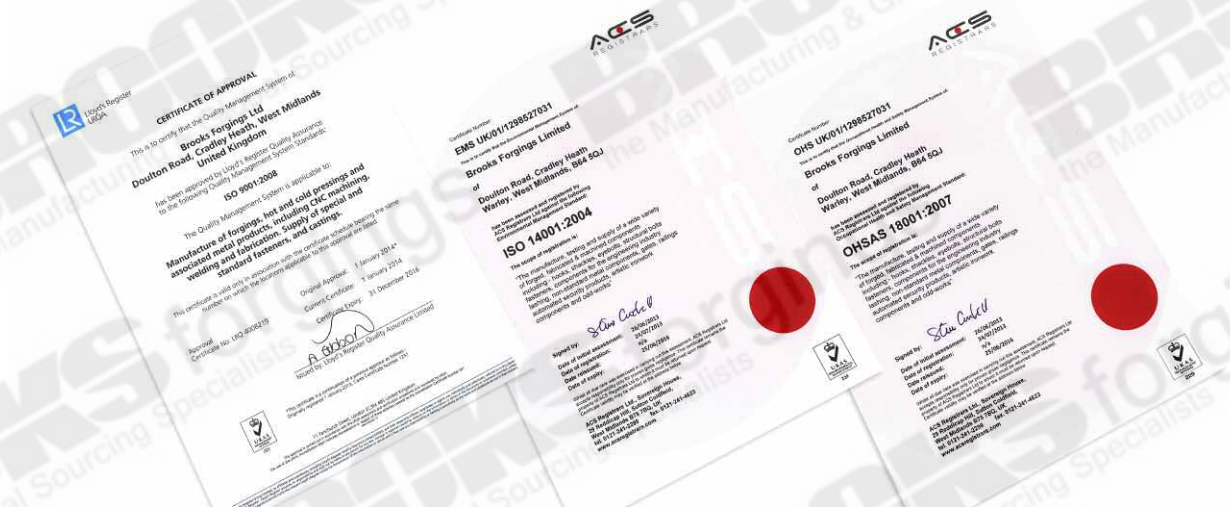
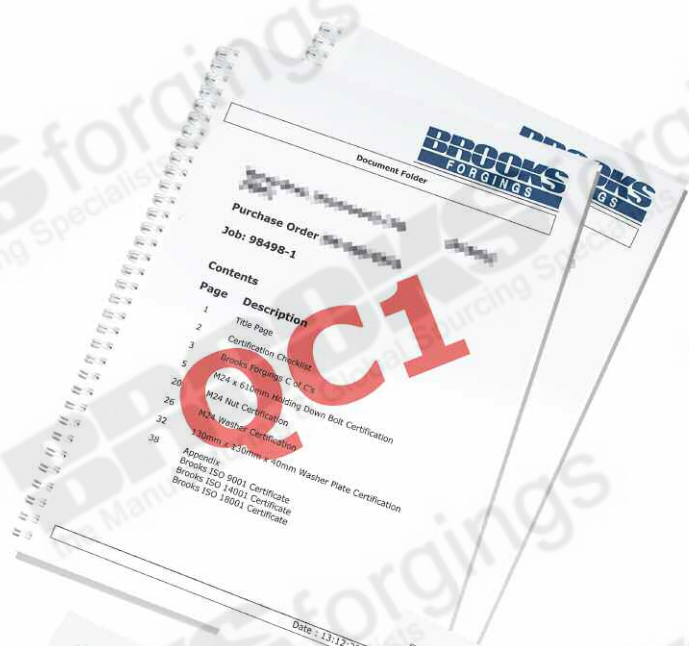
Our ISO 9001 registration demonstrates our competency and experience in all areas of our quality control system. Many projects within the construction industry demand vigorous traceability of all supplied components, we are able to provide detailed quality manuals to grade 1, 2 and 3.

- Quality Control & Experience
- Material Identification & Traceability
- Product Identification & Traceability
- Process Methods
- Photographic Records
- Information Management System
- Quality Assurance Systems

FULL QUALITY DOCUMENTATION TO QCI, QC2 & QC3 ON REQUEST



European Certified Materials



ISO 9001



Approved



Approved



ISO 14001



OHSAS 18001

APPROVED TO ISO 9001 QUALITY

ISO 14001 ENVIRONMENTAL

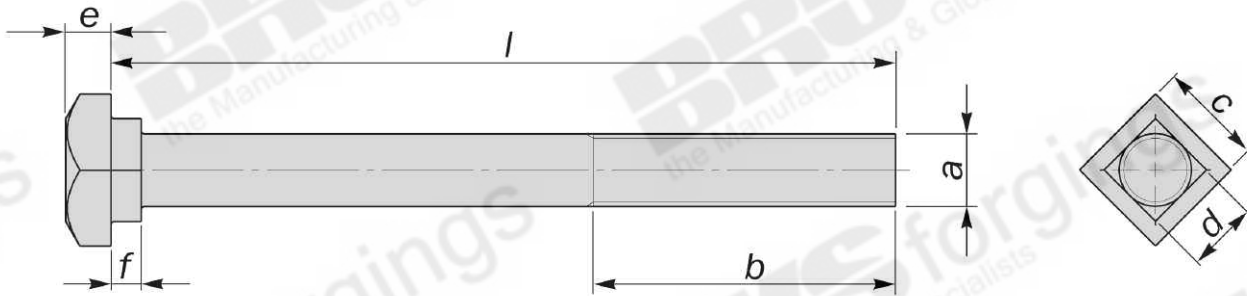
OHSAS 18001 HEALTH & SAFETY

INTRODUCTION

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SQ SQ HOLDING DOWN BOLTS - BS 7419 : 2012

- TO BS 7419:2012



THREAD DIA	A	M16	M20	M24	M30	M36	M42	M48	M56	M64
B	MAX	122	127.5	133	140.5	148	155.5	163	172.5	182
	MIN	116	120	124	130	136	142	148	156	164
SHANK DIA	MAX	16.7	20.84	24.84	30.84	37	43	49	57.2	65.2
	MIN	15.3	19.16	23.16	29.16	35	41	47	54.8	62.8
C	MAX	24	30	36	46	55	65	75	85	95
	MIN	23.16	29.16	35	45	53.8	63.1	73.1	82.8	92.8
D	MAX	16.7	20.84	24.84	30.84	37	43	49	57.2	65.2
	MIN	15.3	19.16	23.16	29.16	35	41	47	54.8	62.8
E	NOM	10	12.5	15	18.7	22.5	26	30	35	40
	MIN	9.25	11.6	14.1	17.65	21.45	24.95	28.95	33.75	38.75
	MAX	10.75	13.4	15.9	19.75	23.55	27.05	31.05	36.25	41.25
F	NOM	8	10	12	15	18	21	24	28	32
	MIN	7.25	9.25	11.1	14.1	17.1	19.95	22.95	26.95	30.75
	MAX	8.75	10.75	12.9	15.9	18.9	22.05	25.05	29.05	33.25
L	FOR DIMENSIONS SEE TABLE OPPOSITE NON STANDARD LENGTHS AVAILABLE UPON REQUEST									

SQ SQ HOLDING DOWN BOLTS



M16 - M72
UP TO 6000MM LENGTH
IN 8.8 GRADE

SQ SQ HOLDING DOWN BOLTS - BS 7419 : 2012

NOMINAL LENGTH (L) OF PREFERRED SIZES INCLUDING WEIGHTS

THREAD DIAMETERS

M16		M20		M24		M30		M36	
mm	Weight (kg)	mm	Weight (kg)	mm	Weight (kg)	mm	Weight (kg)	mm	Weight (kg)
300	0.53	300	0.85	---	---	---	---	---	---
375	0.64	375	1.03	375	1.51	---	---	---	---
450	0.76	450	1.22	450	1.78	450	2.90	450	4.22
525	0.88	525	1.43	525	2.04	525	3.35	525	4.82
600	1.00	600	1.58	600	2.31	600	3.77	600	5.42
---	---	750	1.95	750	2.84	750	4.60	750	6.62
---	---	1000	2.00	1000	3.72	1000	5.95	1000	8.62
---	---	---	---	1250	4.61	1250	7.34	1250	10.62

TOLERANCES ON NORMAL LENGTH (L)

NOMINAL LENGTH (mm)	TOLERANCE (mm)
250 ≤ L ≤ 315	± 5.2
315 < L ≤ 400	± 5.7
400 < L ≤ 500	± 6.3
500 < L ≤ 625	± 6.8
625 < L ≤ 800	± 7.2
800 < L ≤ 1000	± 7.4
1000 < L ≤ 1250	± 7.6

EXTRA TOLERANCE

Square square bolts are designed to be used with washer plates.

When located in position the square under head slots into the hole, preventing rotation when tightening.

This application also gives tolerance for lining up with structural stantion base plates.

WASHER PLATES - PAGE 17

MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**

NON STANDARD LENGTHS BOTH SHORTER AND LONGER THAN SHOWN ARE AVAILABLE

UP TO 6000MM LONG ON REQUEST





HAMMERHEAD T BOLTS

Brooks Forgings Ltd manufacture and supply Hammerhead T Bolts to DIN 7992, DIN 261, DIN 188 and DIN 186.

THE FULLY REMOVABLE FOUNDATION SYSTEM SOLUTION

When used in conjunction with pre-fabricated tube assemblies the Hammerhead T Bolt becomes a removable and reusable foundation solution.

With the tube assembly cast into concrete the bolt can be simply inserted and twisted through 90° locking it into the specially fabricated base plate.

In case of application error, commonly position or location issues, the low cost tube assembly can be discarded and the bolt removed for re-use during correct installation.



REMOVABLE FOUNDATION SYSTEMS



FORGING



MACHINING



ROLL THREADING

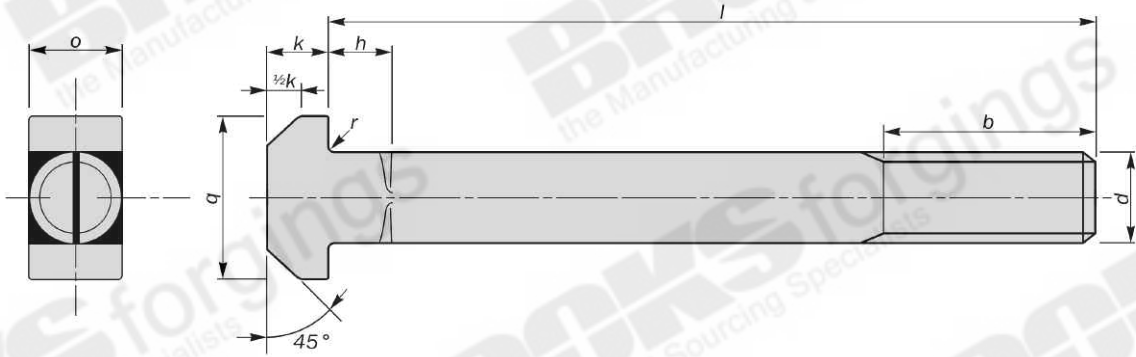


UP TO M100 DIAMETERS
SPECIAL NON-STANDARDS
ON REQUEST



HAMMERHEAD T BOLTS - DIN 7992

BOLTS ARE MANUFACTURED TO CUSTOMERS REQUIRED LENGTHS IN ACCORDANCE TO DIN 7992



d	B	H	K	O	Q	R
mm ø	mm	mm	mm	mm	mm	mm
M24	100	18	18	24	65	1.6
M30	120	20	22	30	75	1.6
M36	140	25	25	36	85	2
M42	170	30	30	42	95	2
M48	200	30	35	48	110	2
M56	220	30	40	56	125	3
M64	240	30	50	64	140	3
M72 X 6	260	30	55	72	155	4
M80 X 6	290	30	60	80	170	4
M90 X 6	320	30	70	90	185	4
M100 X 6	350	30	75	100	205	5

SLOTTED PLATES - PAGE 14



MATERIAL

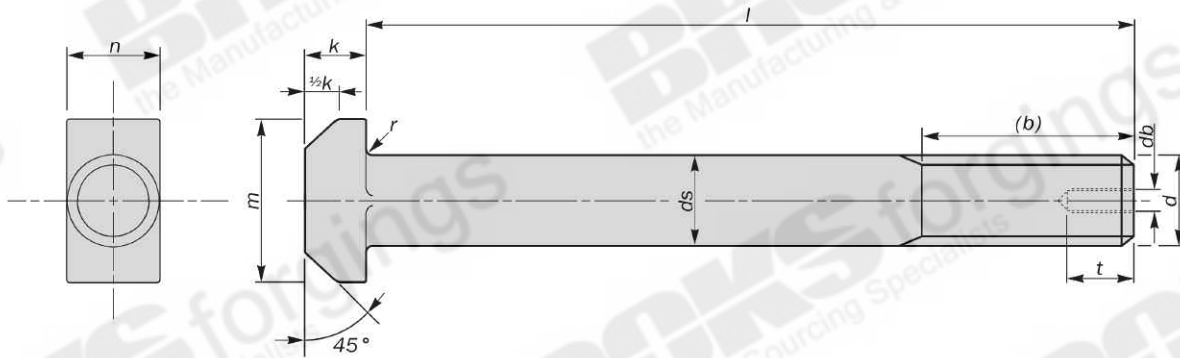
- CARBON STEELS
- STAINLESS STEELS
- ALLOY STEELS
- B7, 4.6, 5.6, 8.8

FINISH

- SELF COLOUR
- GALVANISED
- ELECTROPLATED
- SHERARDISED
- PTFE COATING

HAMMERHEAD T BOLTS - DIN 261

BOLTS ARE MANUFACTURED TO CUSTOMERS REQUIRED LENGTHS IN ACCORDANCE TO DIN 261



d	PI	B2	B3	B4	db	ds	K	N	M	R	T
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	min
M24	3	54	60	-	-	24	15	24	43	1.6	-
M30	3.5	66	72	-	-	30	19	30	54	1.6	-
M36	4	78	84	-	M12	36	23	36	66	2	22
M42	4.5	90	96	109	M12	42	26	42	80	2	22
M48	5	-	108	121	M12	48	30	48	88	2	22
M56	5.5	-	124	137	M16	56	35	56	102	3	26
M64	6	-	130	143	M16	64	40	64	115	3	26
M72	6	-	-	169	M16	72	45	72	128	4	26
M80	6	-	-	185	M20	80	50	80	140	4	33
M90	6	-	-	205	M20	90	55	90	155	4	33
M100	6	-	-	225	M20	100	62	100	170	5	33

DIN 261 WITH REDUCED SHANK ALSO AVAILABLE ON REQUEST

PI - Pitch of thread (coarse)

B2 - For overall length underhead up to and including 120mm

B3 - For overall length underhead up to and including 200mm

B4 - For overall length underhead exceeding 200mm

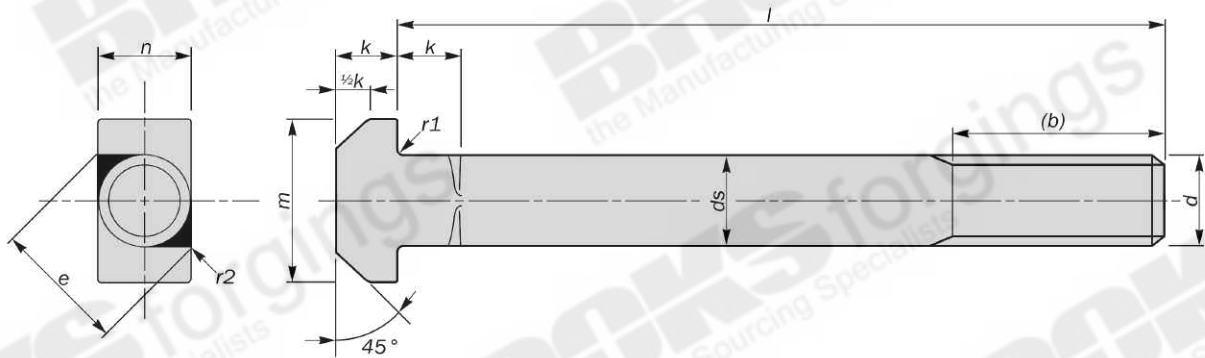
**SLOTTED PLATES
PAGE 14**





HAMMERHEAD T BOLTS - DIN 188

BOLTS ARE MANUFACTURED TO CUSTOMERS REQUIRED LENGTHS IN ACCORDANCE TO DIN 188



d	P1	B2	B3	B4	ds	K	N	M	R1	R2
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
M24	3	54	60	-	24	15	24	43	1.6	3.6
M30	3.5	66	72	-	30	19	30	54	1.6	4.5
M36	4	78	84	97	36	23	36	66	2	5.4
M42	4.5	-	96	109	42	26	42	80	2	6.3
M48	5	-	108	121	48	30	48	88	2	7.2
M56	5.5	-	124	137	56	35	56	102	3	8.4
M64	6	-	130	143	64	40	64	115	3	9.6
M72	6	-	156	169	72	45	72	128	4	10.8
M80	6	-	172	185	80	50	80	140	4	12

P1 - Pitch of thread (coarse)

B2 - For overall length underhead up to and including 120mm

B3 - For overall length underhead up to and including 200mm

B4 - For overall length underhead exceeding 200mm

SLOTTED PLATES
PAGE 14

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

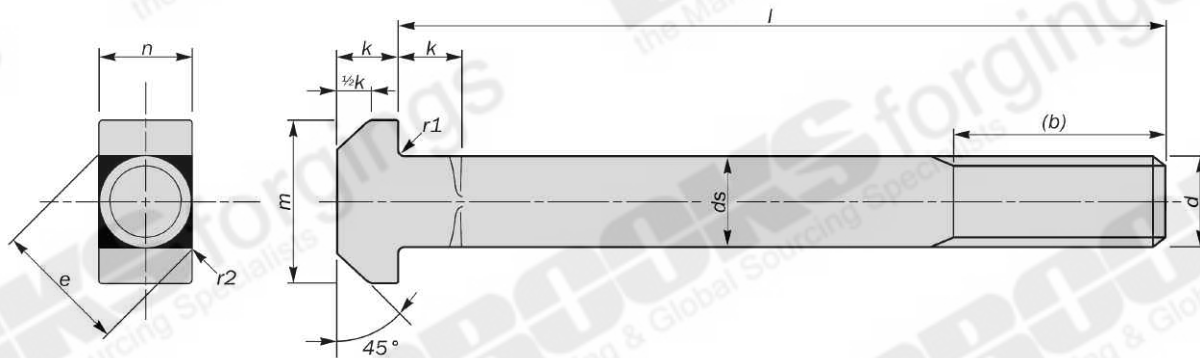
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



HAMMERHEAD T BOLTS - DIN 186

BOLTS ARE MANUFACTURED TO CUSTOMERS REQUIRED LENGTHS IN ACCORDANCE TO DIN 186



TYPE A - THREADED END

d	P1	ds	B2	B3	E	K	N	M	R1	R2
mm	mm	mm	mm	mm	min	mm	mm	mm	mm	mm
M24	3	24	54	60	29.48	15	24	43	1.6	3.6
M30	3.5	30	66	72	37.20	19	30	54	1.6	4.5
M36	4	36	78	84	44.57	23	36	66	2	5.4
M42	4.5	42	-	96	52.29	26	42	80	2	6.3
M48	5	48	-	108	60.00	30	48	88	2	7.2

TYPE B - FULLY THREADED ALSO AVAILABLE ON REQUEST

SLOTTED PLATES - PAGE 14

P1 - Pitch of thread (coarse)

B2 - For overall length underhead up to and including 120mm

B3 - For overall length underhead up to and including 200mm

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



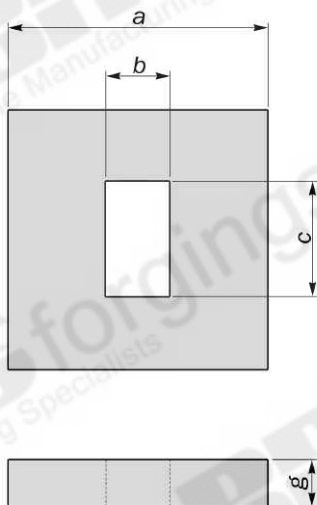
HAMMERHEAD T-BOLTS - DIN 186

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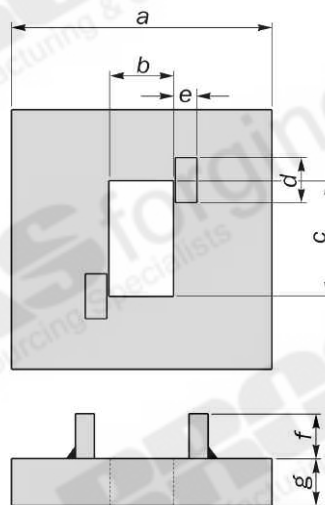


HAMMERHEAD T BOLTS - PLATES

TYPE F

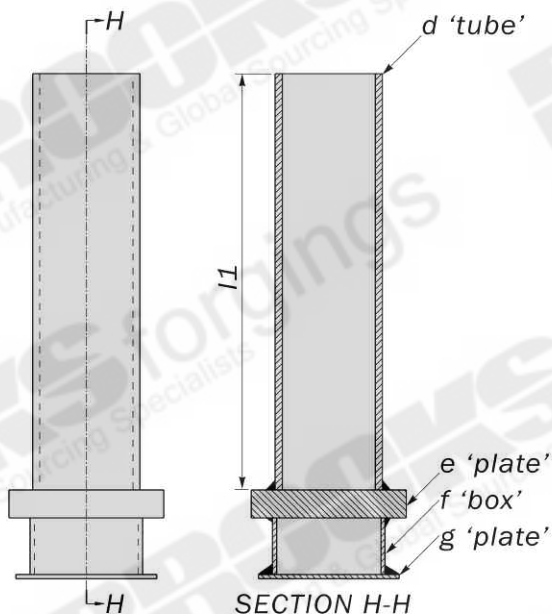


TYPE G



BOLT TUBE ASSEMBLIES

**TYPICAL SIZES SHOWN
MADE TO SUIT CUSTOMERS
REQUIREMENTS**



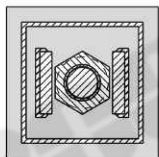
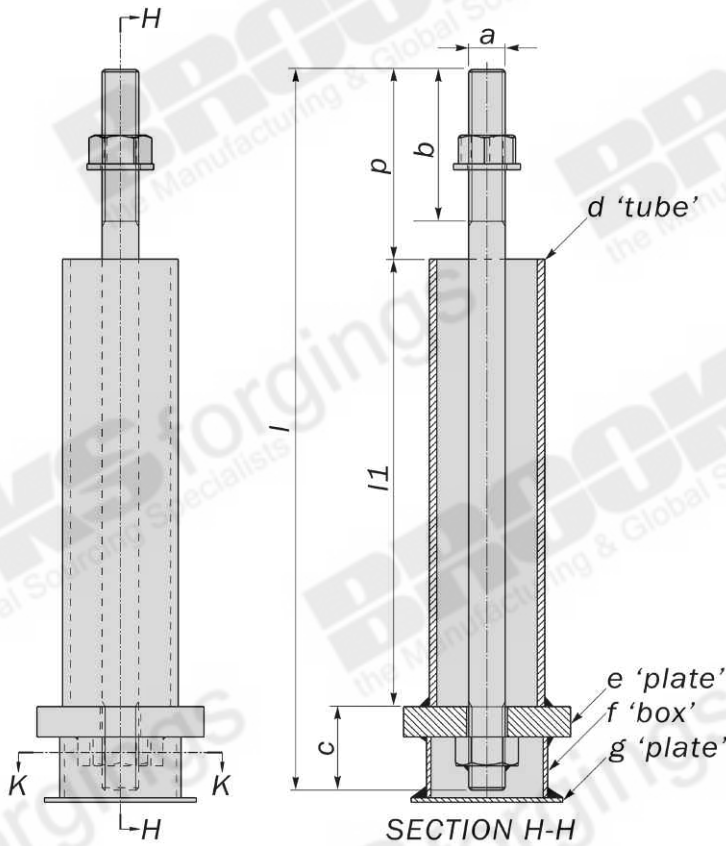
D	E	F	G
mm	mm	mm	mm
48.3	80x80x10	70x70x30	80x80x3
48.3	80x80x15	70x70x35	80x80x3
76.1	110x110x20	80x80x40	100x100x3
76.1	110x110x25	90x90x50	110x100x3
76.1	110x110x25	90x90x50	110x110x3
76.1	130x130x25	100x100x60	120x120x3
101.6	160x160x30	120x120x70	140x140x3
101.6	180x180x35	130x130x70	150x150x3
101.6	250x250x35	130x130x90	150x150x3
101.6	250x250x35	140x140x100	160x160x3
101.6	300x300x40	150x150x120	180x180x3

**PLATES 'E' SUPPLIED WITH REQUIRED HOLES
SEE PAGES 17 & 18 FOR FULL RANGE OF PLATES**



BOLT ASSEMBLIES - WITH TUBE, PLATE, LUGS & BOX

BOLT ASSEMBLIES



SECTION K-K

**COMPLETE WITH LUGS
TO PREVENT ROTATION**



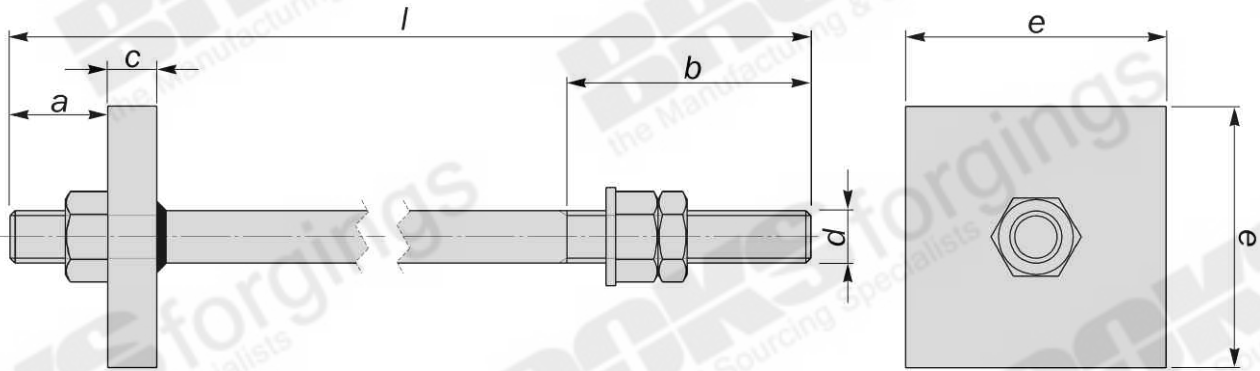
A	C	D	E	F	G	B	L	LI	P
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
M16	35	48.3	80x80x10	70x70x30	80x80x3				
M20	45	48.3	80x80x15	70x70x35	80x80x3				
M24	55	76.1	110x110x20	80x80x40	100x100x3				
M27	65	76.1	110x110x25	90x90x50	110x100x3				
M30	70	76.1	110x110x25	90x90x50	110x110x3				
M36	80	76.1	130x130x25	100x100x60	120x120x3				
M42	95	101.6	160x160x30	120x120x70	140x140x3				
M48	100	101.6	180x180x35	130x130x70	150x150x3				
M52	115	101.6	250x250x35	130x130x90	150x150x3				
M56	120	101.6	250x250x35	140x140x100	160x160x3				
M64	135	101.6	300x300x40	150x150x120	180x180x3				

**TO SUIT
CUSTOMER
REQUIREMENTS**

QUALITY TO QC1, QC2 AND QC3 ON REQUEST



BOLT ASSEMBLIES - WITHOUT TUBE



D	A	C	E	L	B
mm	mm	mm	mm	mm	mm
M16	45	15	80	TO SUIT CUSTOMER REQUIREMENTS	
M20	45	15	100		
M24	55	20	125		
M30	75	30	125		
M36	80	30	125		
M42	95	30	150		
M48	100	30	150		
M56	115	35	175		
M64	140	40	200		

**UP TO M100 DIAMETERS
EUROPEAN MATERIAL**

MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**



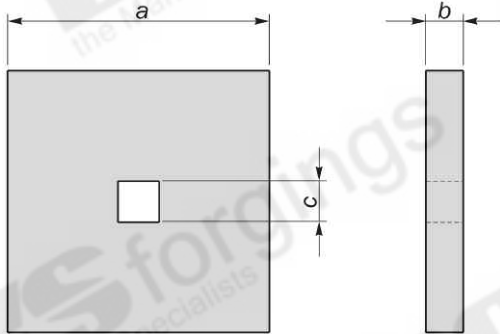
BOLT ASSEMBLIES

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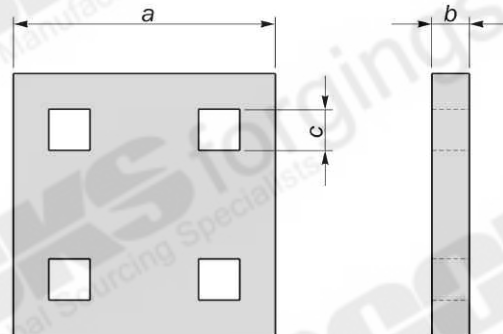
WASHER PLATES

TYPE A TO TYPE D ARE DESIGNED TO BE USED WITH SQ SQ HOLDING DOWN BOLTS TO BS 7419

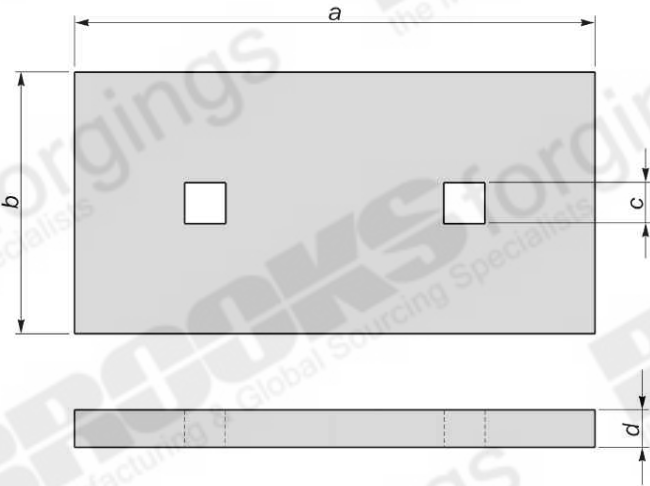
TYPE A



TYPE B

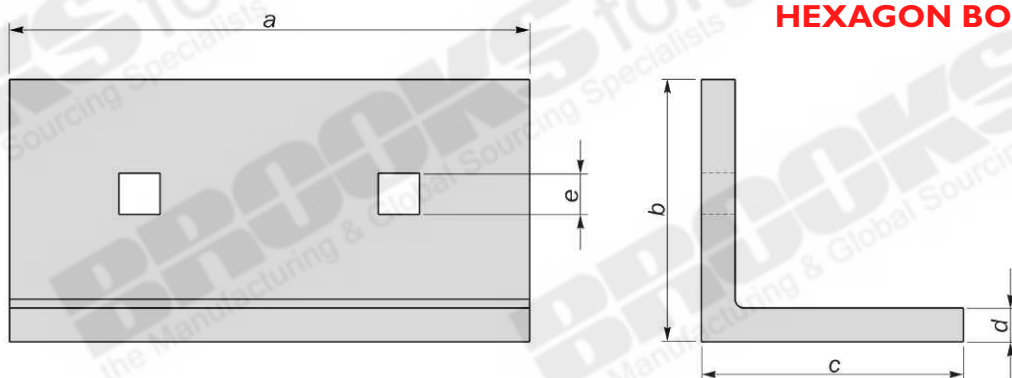


TYPE C



**PLATES AVAILABLE WITH
ROUND OR SQUARE HOLES
& LOCKING CAP IF
REQUIRED FOR USE WITH
HEXAGON BOLTS**

TYPE D

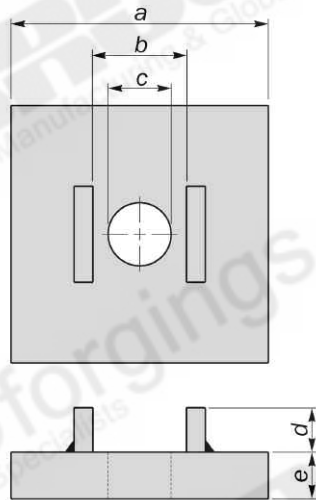


WASHER PLATES



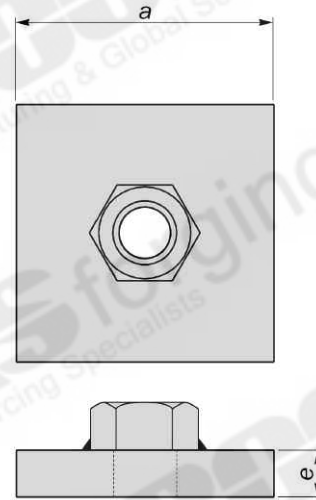
WASHER PLATES

TYPE E



TYPE E FOR USE WITH TIE RODS AND NUTS

TYPE H

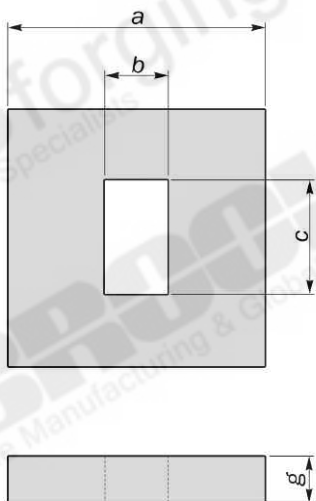


TYPE H WITH WELDED NUT TO REQUIREMENTS

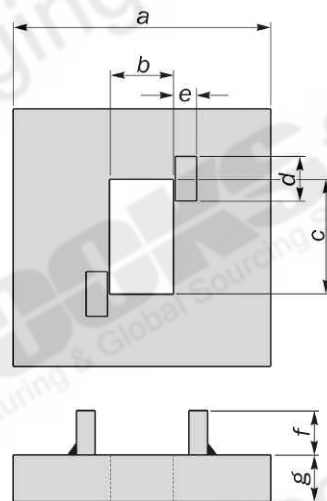


TYPE F & TYPE G FOR REMOVABLE FOUNDATION SYSTEMS - SEE PAGE 9 FOR DETAILS

TYPE F



TYPE G



WASHER PLATES

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FOUNDATION ACCESSORIES

WAXED CARDBOARD CONES

Waxed cardboard cones provide an easy way of sitting holding down bolts into the ground to fix steel frame buildings.

We can supply from stock on a next day basis direct to sites within the UK. Non-standard cones sizes can be made to order.

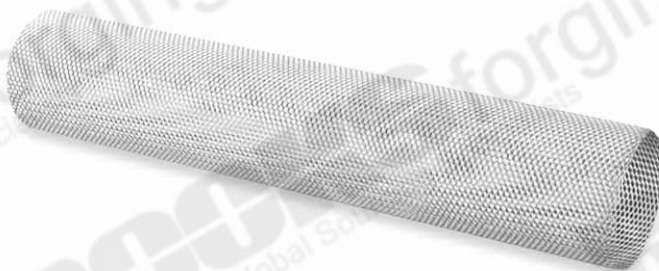
SIZE	LENGTH	TOP DIA	BOTTOM DIA
inches	mm	mm	mm
9	229	20	71
12	305	26	90
15	380	25	110
18	457	32	115
21	534	32	126
24	610	32.5	140
30	762	32.5	130



EXPAMET MESH TUBE

Expamet mesh can be fabricated into tubes for use in various construction applications.

Made to order, can be supplied to customers required lengths and diameters.



DIA	LENGTH
mm	mm
75	150
75	225
75	300
75	450
75	600
100	375
100	450
100	600

OTHER SIZES ON REQUEST

CIRCULAR HOLLOW SECTION TUBES (CHS)

Available in various wall thicknesses and lengths, supplied to suit customer requirements.

We have on-site robot welding facilities to weld CHS tube to washer plates and other materials and machining capacity to add additional holes where required.

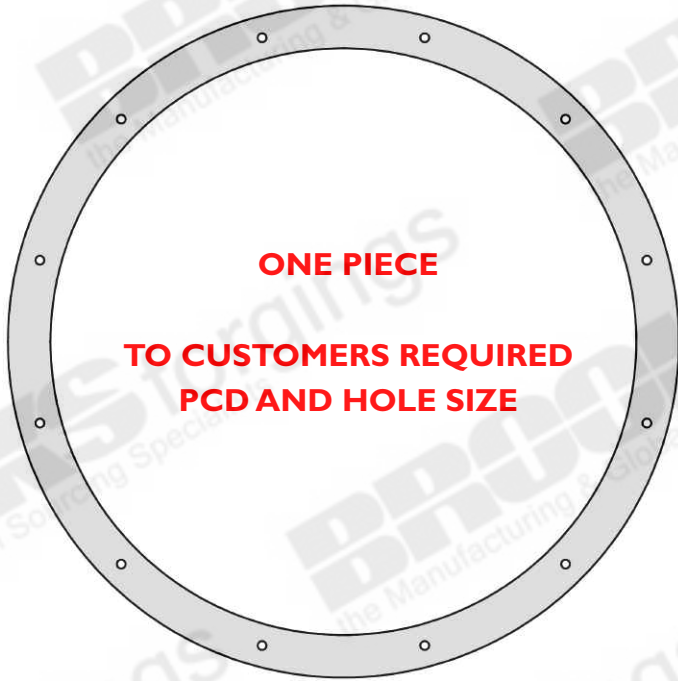
TUBE SIZES	
mm	mm
48.3	139.7
60.3	168.3
76.1	193.7
88.9	219.1
101.6	291.1
114.3	



SQUARE HOLLOW SECTION ALSO AVAILABLE ON REQUEST



RING PLATE PROFILES

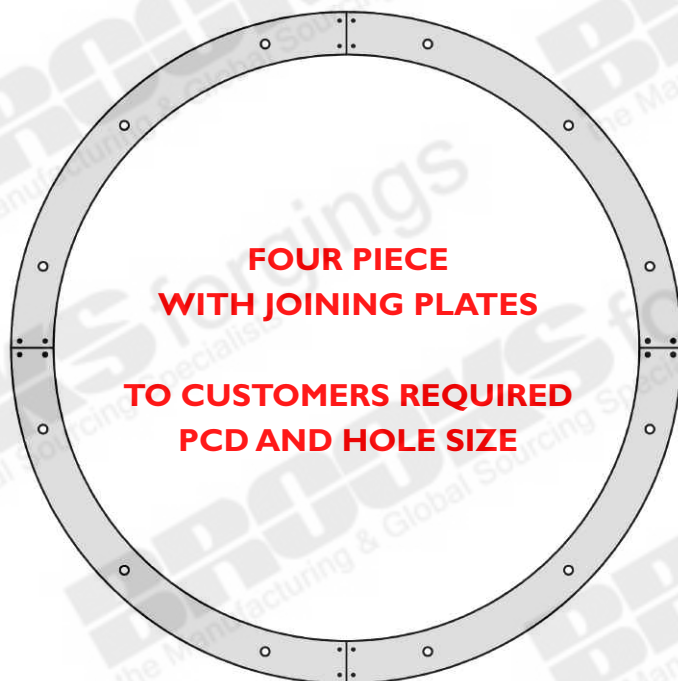


ONE PIECE
TO CUSTOMERS REQUIRED
PCD AND HOLE SIZE

Ring plate profiles up to a maximum of 1500MM outer diameter can be supplied in one piece.

Profiles with an outer diameter of 1500MM will be supplied in four quarter pieces and joining plates.

Thicknesses, PCD and hole sizes to customers requirements.



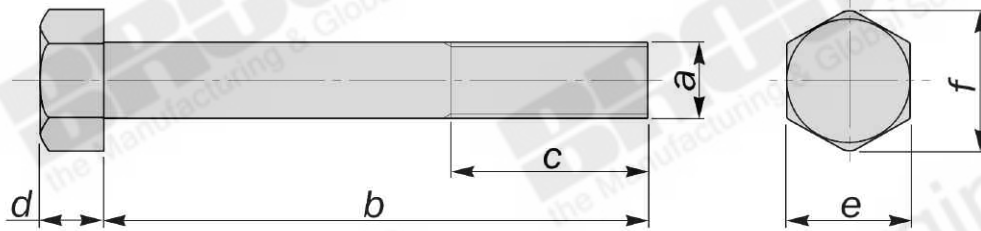
FOUR PIECE
WITH JOINING PLATES
TO CUSTOMERS REQUIRED
PCD AND HOLE SIZE





HEXAGON BOLTS - METRIC

- TO BS 4190 : 1967



STANDARD THREAD LENGTHS	
Normal length of bolt B	Length of thread C
Up to and including 125mm	2A + 6mm
Over 125mm up to and including 200mm	2A + 12mm
Over 200mm	2A + 25mm

THREAD DIA	PITCH OF THREAD	DIA OF SHANK UNTHREADED		WIDTH ACROSS FLATS		WIDTH ACROSS CORNERS		HEIGHT OF HEAD		RADIUS UNDER HEAD
				E		F		D		
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
mm	Coarse Pitch Series	mm	mm	mm	mm	mm	mm	mm	mm	mm
M5	0.8	4.52	5.48	7.64	8	8.63	9.2	3.125	3.875	0.35
M6	1	5.52	6.48	9.64	10	10.89	11.5	3.625	4.375	0.40
M8	1.25	7.42	8.58	12.57	13	14.20	15.0	5.125	5.875	0.80
M10	1.5	9.42	10.58	16.57	17	18.72	19.6	6.55	7.45	0.80
M12	1.75	11.30	12.70	18.48	19	20.88	21.9	7.55	8.45	1.25
M16	2	15.30	16.70	23.16	24	26.17	27.7	9.55	10.45	1.25
M20	2.5	19.16	20.84	29.16	30	32.95	34.6	12.10	13.90	1.78
(M22)	2.5	21.16	22.84	31.00	32	35.03	36.9	13.10	14.90	1.78
M24	3	23.16	24.84	35.00	36	39.55	41.6	14.10	15.90	1.78
(M27)	3	26.16	27.84	40.00	41	45.20	47.3	16.10	17.90	2.28
M30	3.5	29.16	30.84	45.00	46	50.85	53.1	17.95	20.05	2.28
(M33)	3.5	32.00	34.00	49.00	50	55.37	57.7	19.95	22.05	2.28
M36	4	35.00	37.00	53.80	55	60.79	63.5	21.95	24.05	2.70
(M39)	4	38.00	40.00	58.80	60	66.44	69.3	23.95	26.05	2.70
M42	4.5	41.00	43.00	63.80	65	72.09	75.1	24.95	27.05	2.80
(M45)	4.5	44.00	46.00	68.80	70	77.74	80.8	26.95	29.05	3.30
M48	5	47.00	49.00	73.80	75	83.39	86.6	28.95	31.05	3.80
(M52)	5	50.80	53.20	78.80	80	89.04	92.4	31.75	34.25	4.70
M56	5.5	54.80	57.20	83.60	85	94.47	98.1	33.75	36.25	4.90
(M60)	5.5	58.80	61.20	88.60	90	100.12	103.9	36.75	39.25	4.90
M64	6	62.80	65.20	93.60	95	105.77	109.7	38.75	41.25	4.90
(M68)	6	66.80	69.20	98.60	100	111.42	115.5	41.75	44.25	4.90

MATERIAL

GRADE 4.6, 5.6, 6.9
STAINLESS STEELS
AVAILABLE IN BS3692
GRADES 8.8, 10.9, 12.9

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARD
THREAD LENGTH AVAILABLE
LENGTHS UP TO 3000MM
() = DENOTES NON PREFERRED SIZES

HEXAGON BOLTS - METRIC

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ISO 9001



Approved



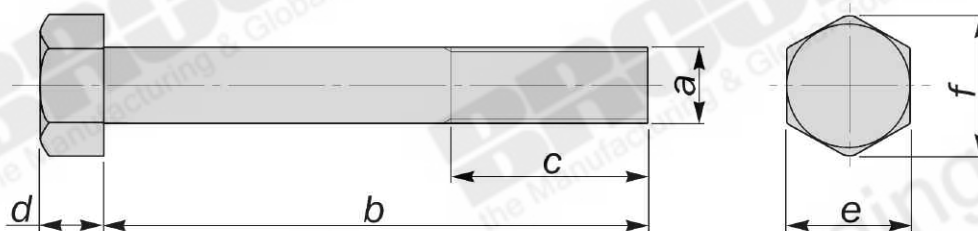
national highway sector schemes

Approved

BROOKS forgings
INDUSTRIAL CATALOGUE

HEXAGON BOLTS - METRIC

-TO BS 3692 : 1967



STANDARD THREAD LENGTHS	
Normal length of bolt B	Length of thread C
Up to and including 125mm	2A + 8mm
Over 125mm up to and including 200mm	2A + 12mm
Over 200mm	2A + 25mm

THREAD DIA	PITCH OF THREAD	DIA OF SHANK UNTHREADED		WIDTH ACROSS FLATS		WIDTH ACROSS CORNERS		HEIGHT OF HEAD		RADIUS UNDER HEAD	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
A	Coarse Pitch Series	E									
mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
M5	0.8	4.82	5.0	7.85	8.0	8.87	9.2	3.35	3.65	0.2	0.35
M6	1	5.82	6.0	9.78	10.0	11.05	11.5	3.85	4.15	0.25	0.4
M8	1.25	7.78	8.0	12.73	13.0	14.38	15.0	5.35	5.65	0.4	0.6
M10	1.5	9.78	10.0	16.73	17.0	18.90	19.6	6.82	7.18	0.4	0.6
M12	1.75	11.73	12.0	18.67	19.0	21.10	21.9	7.82	8.18	0.6	1.1
(M14)	2	13.73	14.0	21.67	22.0	24.49	25.4	8.82	9.18	0.6	1.1
M16	2	15.73	16.0	23.67	24.0	26.75	27.7	9.82	10.18	0.6	1.1
(M18)	2.5	17.73	18.0	26.67	27.0	30.14	31.2	11.785	12.215	0.6	1.1
M20	2.5	19.67	20.0	29.67	30.0	33.53	34.6	12.785	13.215	0.8	1.2
(M22)	2.5	21.67	22.0	31.61	32.0	35.72	36.9	13.785	14.215	0.8	1.2
M24	3	23.67	24.0	35.38	36.0	39.98	41.6	14.785	15.215	0.8	1.2
(M27)	3	26.67	27.0	40.38	41.0	45.63	47.3	16.785	17.215	1.0	1.7
M30	3.5	29.67	30.0	45.38	46.0	51.28	53.1	18.74	19.26	1.0	1.7
(M33)	3.5	32.61	33.0	49.38	50.0	55.80	57.7	20.74	21.26	1.0	1.7
M36	4	35.61	36.0	54.26	55.0	61.31	63.5	22.74	23.26	1.0	1.7
(M39)	4	38.61	39.0	59.26	60.0	66.96	69.3	24.74	25.26	1.0	1.7
M42	4.5	41.61	42.0	64.26	65.0	72.61	75.1	25.74	26.26	1.2	1.8
(M45)	4.5	44.61	45.0	69.26	70.0	78.26	80.8	27.74	28.26	1.2	1.8
M48	5	47.61	48.0	74.26	75.0	83.91	86.6	29.74	30.26	1.6	2.3
(M52)	5	51.54	52.0	79.26	80.0	89.56	92.4	32.69	33.31	1.6	2.3
M56	5.5	55.54	56.0	84.13	85.0	95.07	98.1	34.69	35.31	2.0	3.5
(M60)	5.5	59.54	60.0	89.13	90.0	100.72	103.9	37.69	38.31	2.0	3.5
M64	6	63.54	64.0	94.13	95.0	106.37	109.7	39.69	40.31	2.0	3.5
(M68)	6	67.54	68.0	99.13	100.0	112.02	115.5	42.69	43.31	2.0	3.5

MATERIAL

GRADE 4.6, 5.6, 6.9
STAINLESS STEELS
AVAILABLE IN BS3692
GRADES 8.8, 10.9, 12.9

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

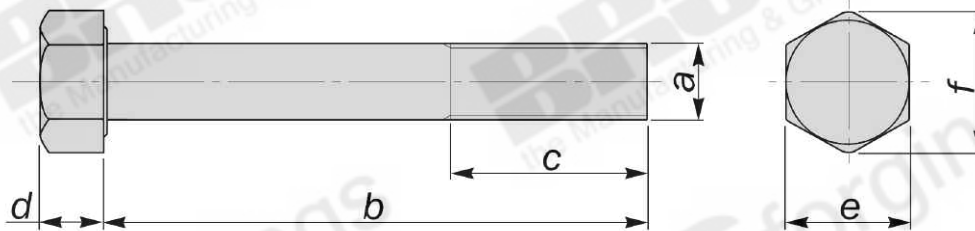
**NON STANDARD
THREAD LENGTH AVAILABLE
LENGTHS UP TO 3000MM
() = DENOTES NON PREFERRED SIZES**

HEXAGON BOLTS - METRIC

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ISO 4014 / DIN 931 - HEXAGON BOLTS

- TO ISO 4014 : 2014



**ALL SIZES SHOWN ARE GRADE B ISO4014
GRADE A SIZES ALSO AVAILABLE ON REQUEST**

STANDARD THREAD LENGTHS	
Normal length of bolt B	Length of thread C
Up to and including 125mm	2A + 6mm
Over 125mm up to and including 200mm	2A + 12mm
Over 200mm	2A + 25mm

THREAD DIA	PITCH OF THREAD	DIA OF SHANK UNTHREADED		E		F	D			RADIUS UNDER HEAD
		GRADE B		GRADE B		GRADE B	GRADE B			
		MIN	MAX	MIN	MAX	MIN	MIN	MAX	NOM	MIN
mm	Coarse Pitch Series	mm	mm	mm	mm	mm	mm	mm	mm	mm
M12	1.75	11.57	12.00	17.57	18.00	19.85	7.21	7.79	7.50	0.60
M16	2	15.57	16.00	23.16	24.00	26.17	9.71	10.29	10.00	0.60
M20	2.5	19.48	20.00	29.16	30.00	32.95	12.15	12.85	12.50	0.80
(M22)	2.5	21.48	22.00	33.00	34.00	37.29	13.65	14.35	14.00	0.80
M24	3	23.48	24.00	35.00	36.00	39.55	14.65	15.35	15.00	0.80
(M27)	3	26.48	27.00	40.00	41.00	45.20	13.65	17.35	17.00	1.00
M30	3.5	29.48	30.00	45.00	46.00	50.85	18.28	19.12	18.70	1.00
(M33)	3.5	32.38	33.00	49.00	50.00	55.37	20.58	21.42	21.00	1.00
M36	4	35.38	36.00	53.8	55.00	60.79	22.08	22.92	22.50	1.00
(M39)	4	38.38	39.00	58.80	60.00	66.44	24.58	25.42	25.00	1.00
M42	4.5	41.38	42.00	63.10	65.00	71.30	25.58	26.42	26.00	1.20
(M45)	4.5	44.38	45.00	68.10	70.00	76.95	27.58	28.42	28.00	1.20
M48	5	47.38	48.00	73.10	75.00	82.60	29.58	30.42	30.00	1.60
(M52)	5	51.26	52.00	78.10	80.00	88.25	32.50	33.50	33.00	1.60
M56	5.5	55.26	56.00	82.80	85.00	93.56	34.50	35.50	35.00	2.00
(M60)	5.5	59.26	60.00	87.80	90.00	99.21	37.50	38.50	38.00	2.00
M64	6	63.26	64.00	92.80	95.00	104.86	39.50	40.50	40.00	2.00

MATERIAL GRADES
4.6, 5.6, 6.9, 8.8, 10.9, 12.9

STAINLESS STEELS

FINISH
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

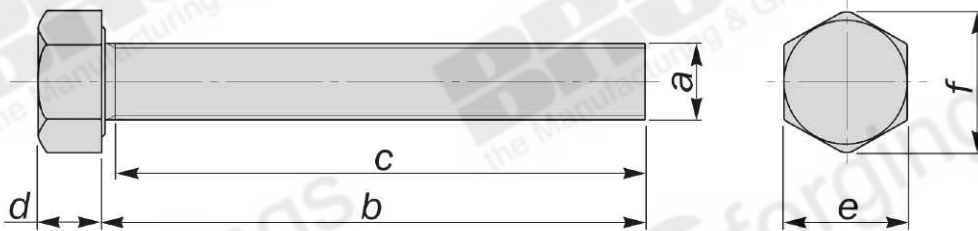
**NON STANDARD
THREAD LENGTH AVAILABLE
LENGTHS UP TO 3000MM**

() = DENOTES NON PREFERRED SIZES



ISO 4017 / DIN 933 - HEXAGON BOLTS

-TO ISO 4017 : 2014



**ALL SIZES SHOWN ARE GRADE B ISO4017
GRADE A SIZES ALSO AVAILABLE ON REQUEST**

STANDARD THREAD LENGTHS	
Normal length of bolt B	Length of thread C
Up to and including 125mm	2A + 6mm
Over 125mm up to and including 200mm	2A + 12mm
Over 200mm	2A + 25mm

THREAD DIA	PITCH OF THREAD	DIA OF SHANK UNTHREADED		E		F	D			RADIUS UNDER HEAD
		GRADE B		GRADE B		GRADE B	GRADE B			
		MIN	MAX	MIN	MAX	MIN	MIN	MAX	NOM	MIN
mm	Coarse Pitch Series	mm	mm	mm	mm	mm	mm	mm	mm	mm
M12	1.75	11.57	12.00	17.57	18.00	19.85	7.21	7.79	7.50	0.60
M16	2	15.57	16.00	23.16	24.00	26.17	9.71	10.29	10.00	0.60
M20	2.5	19.48	20.00	29.16	30.00	32.95	12.15	12.85	12.50	0.80
(M22)	2.5	21.48	22.00	33.00	34.00	37.29	13.65	14.35	14.00	0.80
M24	3	23.48	24.00	35.00	36.00	39.55	14.65	15.35	15.00	0.80
(M27)	3	26.48	27.00	40.00	41.00	45.20	13.65	17.35	17.00	1.00
M30	3.5	29.48	30.00	45.00	46.00	50.85	18.28	19.12	18.70	1.00
(M33)	3.5	32.38	33.00	49.00	50.00	55.37	20.58	21.42	21.00	1.00
M36	4	35.38	36.00	53.8	55.00	60.79	22.08	22.92	22.50	1.00
(M39)	4	38.38	39.00	58.80	60.00	66.44	24.58	25.42	25.00	1.00
M42	4.5	41.38	42.00	63.10	65.00	71.30	25.58	26.42	26.00	1.20
(M45)	4.5	44.38	45.00	68.10	70.00	76.95	27.58	28.42	28.00	1.20
M48	5	47.38	48.00	73.10	75.00	82.60	29.58	30.42	30.00	1.60
(M52)	5	51.26	52.00	78.10	80.00	88.25	32.50	33.50	33.00	1.60
M56	5.5	55.26	56.00	82.80	85.00	93.56	34.50	35.50	35.00	2.00
(M60)	5.5	59.26	60.00	87.80	90.00	99.21	37.50	38.50	38.00	2.00
M64	6	63.26	64.00	92.80	95.00	104.86	39.50	40.50	40.00	2.00

MATERIAL GRADES
4.6, 5.6, 6.9, 8.8, 10.9, 12.9
STAINLESS STEELS

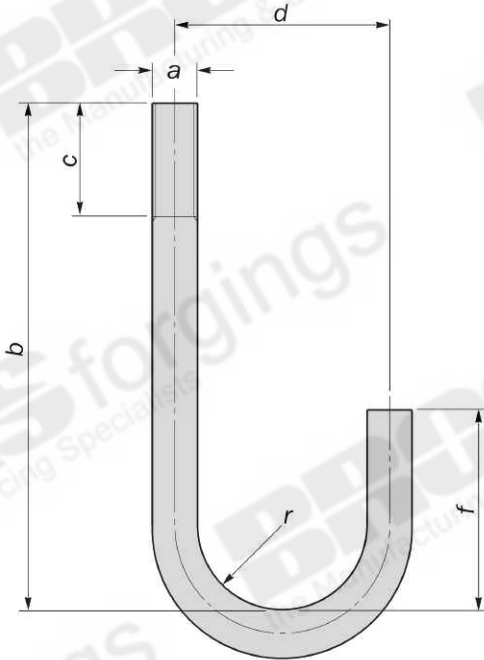
FINISH
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

**NON STANDARD
THREAD LENGTH AVAILABLE
LENGTHS UP TO 3000MM
() = DENOTES NON PREFERRED SIZES**

ISO 4017 / DIN 933 - HEXAGON BOLTS

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J BOLTS



J-BOLTS

A	B	C	D	F	R
mm	mm	mm	mm	mm	mm
M12	124	110	72	66	30
M16	167	115	80	88	40
M20	225	120	100	110	50
M24	428	125	124	123	50
M30	472	130	180	135	75
M36	640	150	186	183	75

SIZES UP TO M100 AND 3000MM LENGTHS - DIMENSIONS TO CUSTOMERS REQUIREMENTS

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

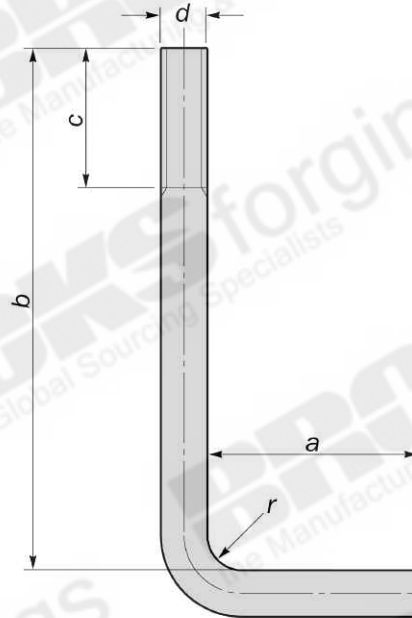
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

**NON STANDARDS MADE
TO SUIT CUSTOMERS
REQUIREMENTS
M12 - M100
LENGTHS UP TO 3000MM**



L BOLTS



D	A	B	C	R
mm	mm	mm	mm	mm
M12	48	124	110	30
M16	84	192	115	40
M20	100	225	120	50
M24	199	428	125	50
M30	250	510	130	75
M36	300	645	150	75

SIZES UP TO M100 AND 3000MM LENGTHS - DIMENSIONS TO CUSTOMERS REQUIREMENTS

NON STANDARDS MADE TO SUIT CUSTOMERS REQUIREMENTS

MATERIAL

- CARBON STEELS
- STAINLESS STEELS
- ALLOY STEELS
- B7, 4.6, 5.6, 8.8

FINISH

- SELF COLOUR
- GALVANISED
- ELECTROPLATED
- SHERARDISED
- PTFE COATING

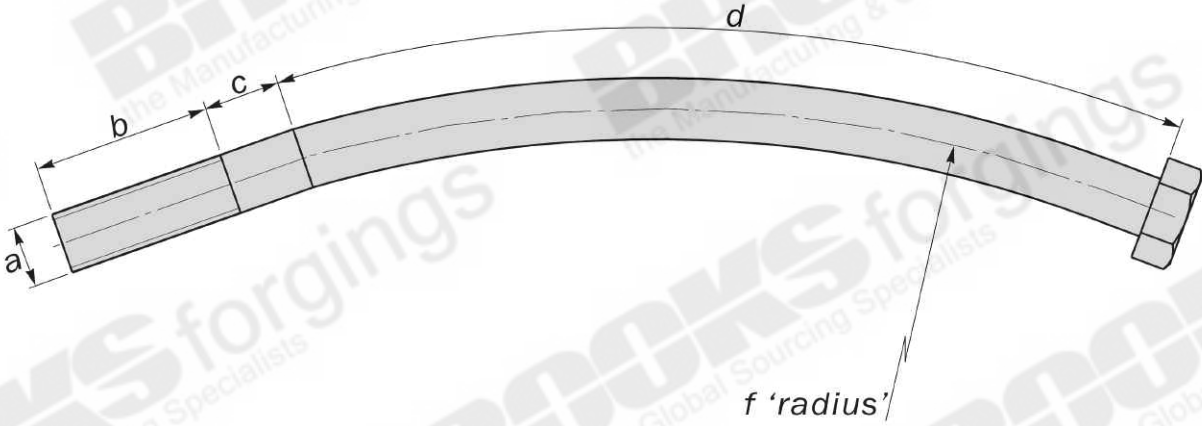


L-BOLTS

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CURVED / TUNNEL BOLTS



**MANUFACTURED TO SUIT
CUSTOMERS REQUIREMENTS**

UP TO M48 ON REQUEST



MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

FINISH

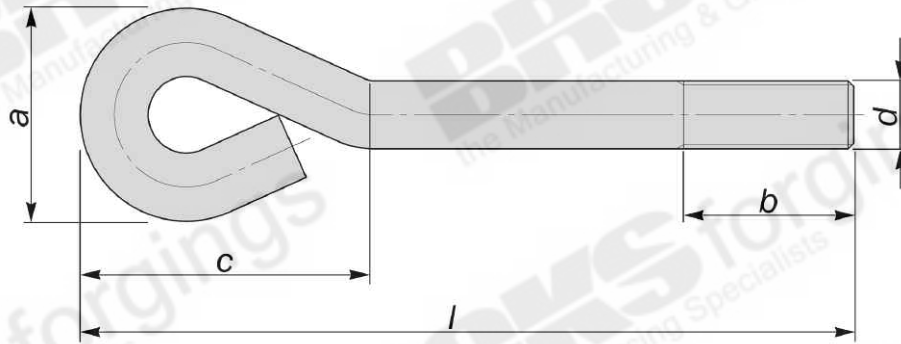
- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**

CURVED / TUNNEL BOLTS

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DIN 529 - TYPE A



d	A	C
mm	mm	mm
M8	24	45
M10	30	55
M12	36	65
M16	48	85
M20	60	105
M24	75	125
M30	95	155
M36	115	190
M42	135	220
M48	155	250
M56	180	290
M64	200	335
M72	240	370

THREAD AND OVERALL LENGTHS TO SUIT CUSTOMERS REQUIREMENTS

NON STANDARDS MANUFACTURED ON REQUEST

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

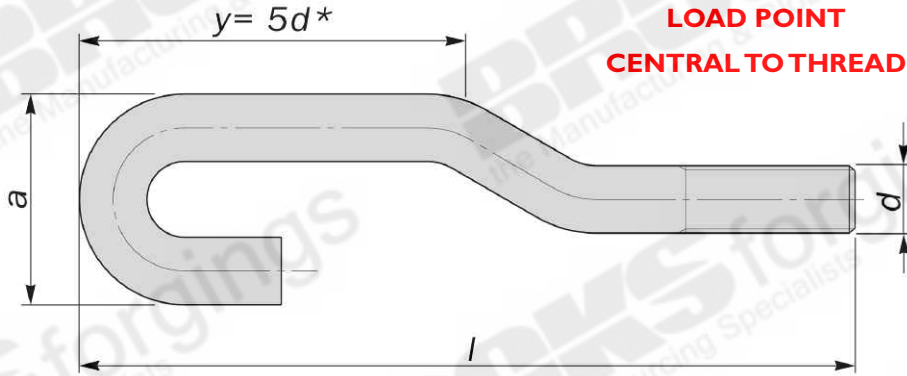
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



DIN 529 - TYPE A

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DIN 529 - TYPE B



DIN 529 - TYPE B

d	A	C
mm	mm	mm
M8	24	45
M10	30	55
M12	36	65
M16	48	85
M20	60	105
M24	75	125
M30	95	155
M36	115	190
M42	135	220
M48	155	250
M56	180	290
M64	200	335
M72	240	370



MATERIAL

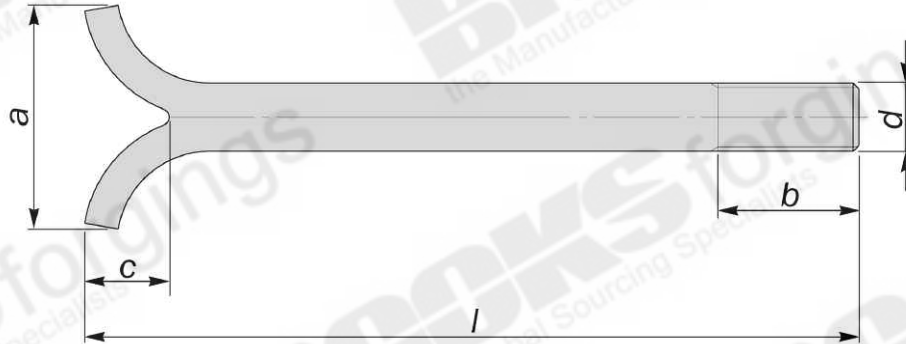
CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



DIN 529 - TYPE C



d	A	C
mm	mm	mm
M8	24	12
M10	30	15
M12	36	18
M16	48	24
M20	60	30
M24	75	36
M30	95	45
M36	115	54
M42	135	63
M48	155	72
M56	180	84
M64	200	96
M72	240	110



MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

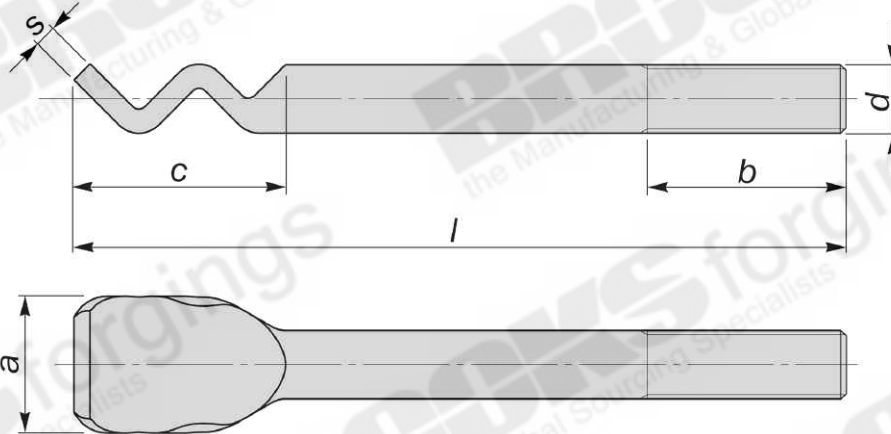
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

DIN 529 - TYPE C

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DIN 529 - TYPE D



d	A	C	S
mm	mm	mm	mm
M8	16	24	3
M10	20	30	3.5
M12	24	36	4
M16	32	48	5
M20	40	60	6
M24	48	72	8

**THREAD AND OVERALL LENGTHS TO
SUIT CUSTOMERS REQUIREMENTS**

**NON STANDARDS MANUFACTURED
ON REQUEST**

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

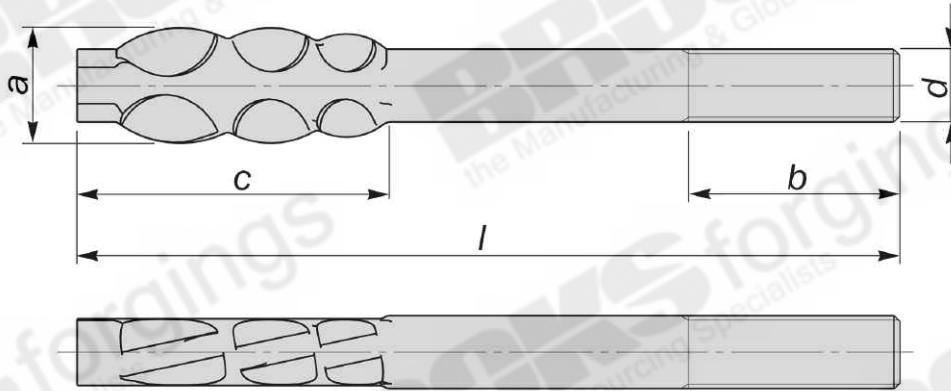
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



DIN 529 - TYPE D



DIN 529 - TYPE E



d	A	C
mm	mm	mm
M8	16	45
M10	20	55
M12	24	70
M16	32	90
M20	40	100
M24	48	135
M30	60	150
M36	72	180
M42	85	260
M48	98	260

SHORTER AND LONGER LENGTHS AVAILABLE UPON REQUEST

SUPPLIED WITH 2 PAIRS OF INDENTATIONS



MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

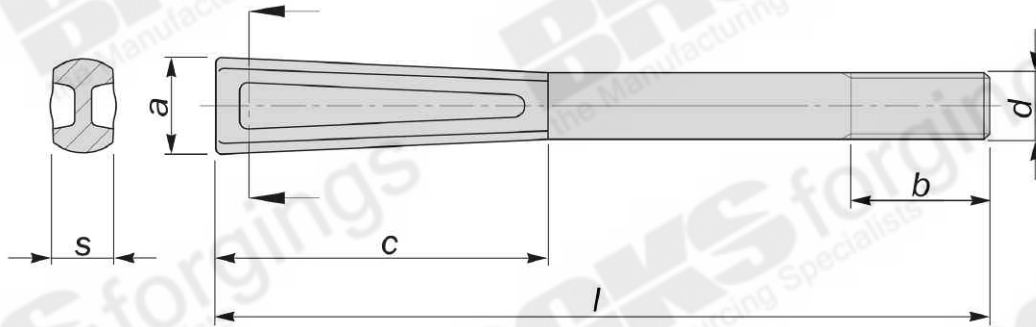
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

DIN 529 - TYPE E

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DIN 529 - TYPE F



d	A	C	S
mm	mm	mm	mm
M8	14	50	6
M10	16	50	8
M12	20	55	10
M16	25	85	14
M20	30	95	18
M24	35	120	22
M30	45	130	26
M36	55	190	30
M42	65	200	36
M48	75	220	42



MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

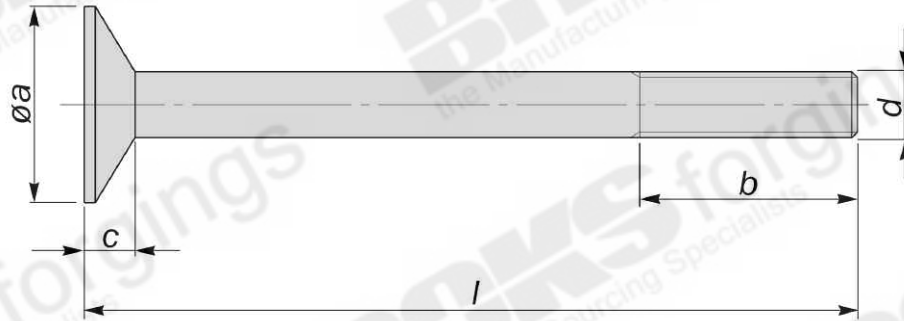
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

DIN 529 - TYPE F

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DIN 529 - TYPE G



d	A	C
mm	mm	mm
M8	20	5
M10	25	6
M12	30	7
M16	40	10
M20	50	12
M24	60	14
M30	75	18
M36	90	22
M42	105	25
M48	120	29
M56	140	34
M64	160	38
M72	180	43



THREAD AND OVERALL LENGTHS TO SUIT CUSTOMERS REQUIREMENTS

NON STANDARDS MANUFACTURED ON REQUEST

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

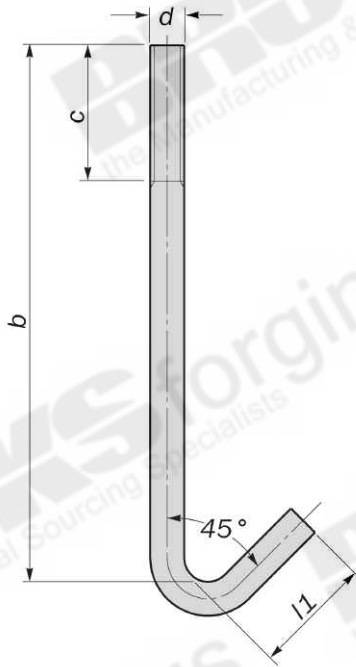


DIN 529 - TYPE G

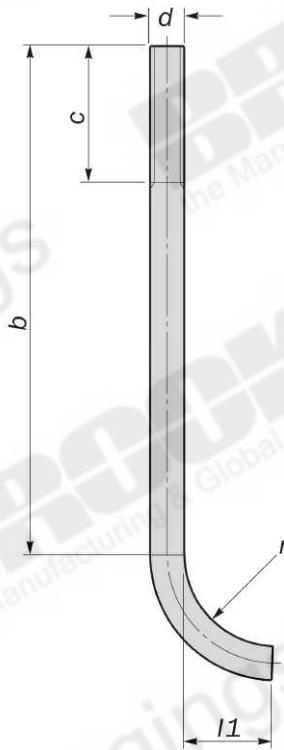
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ANCHOR BOLTS - MISCELLANEOUS

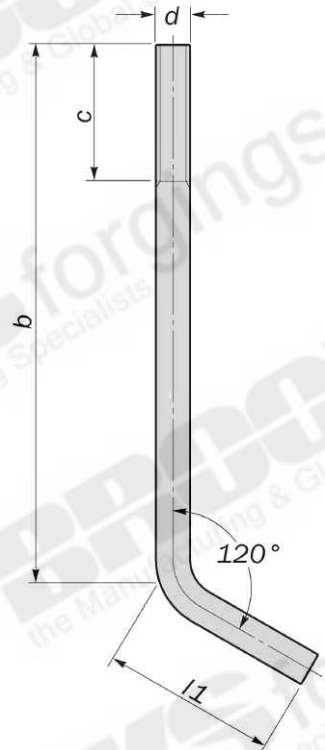
TYPE A



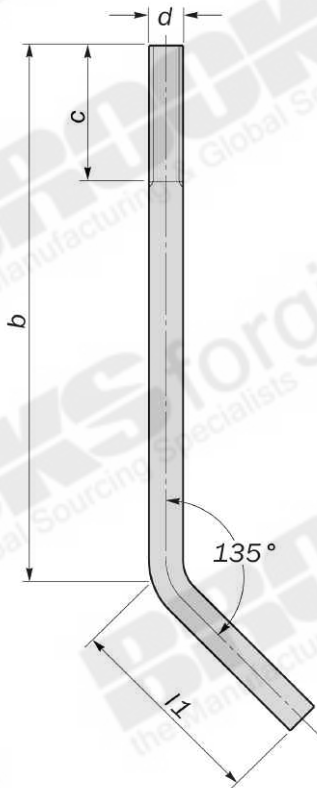
TYPE B



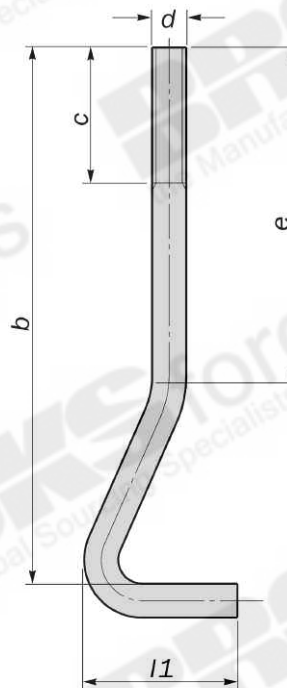
TYPE C



TYPE D



TYPE E



**NON STANDARDS
MADE TO SUIT
CUSTOMERS
REQUIREMENTS
M8 - M100**

MATERIAL

- CARBON STEELS
- STAINLESS STEELS
- ALLOY STEELS
- B7, 4.6, 5.6, 8.8

FINISH

- SELF COLOUR
- GALVANISED
- ELECTROPLATED
- SHERARDISED
- PTFE COATING

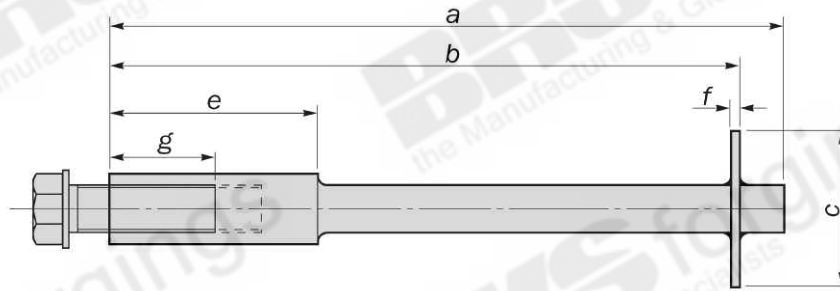
ANCHOR BOLTS - MISCELLANEOUS

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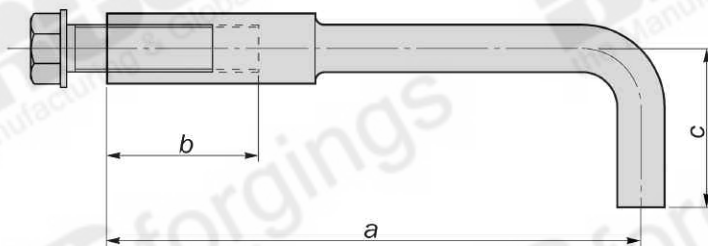
CAST IN ANCHOR SOCKETS

- CAST IN SOCKET WITH PLATE



TO SUIT	A	B	C	E	F	G
Bolt Size	mm	mm	mm SQ	mm	mm	mm
M20 x 50	198	180	60	50	8	22 - 28
M24 x 60	240	220	70	60	8	27 - 34
M30 x 80	300	278	80	75	10	33 - 42
M36 x 80	308	283	90	90	10	40 - 51
M42 x 80	397	370	100	105	12	57 - 59
M48 x 120	408	377	120	120	16	53 - 68
M56 x 140	420	389	130	140	16	62 - 79

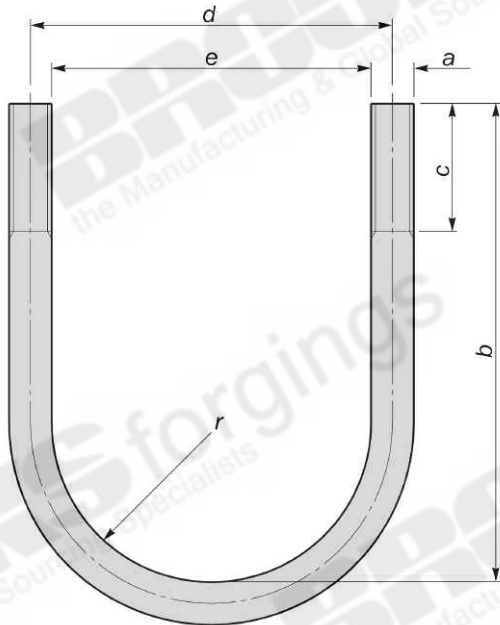
- CAST IN SOCKET (BENT)



TO SUIT	A	B	C
Bolt Size	mm	mm	mm
M20 x 50	210	50	60
M24 x 60	260	65	60
M30 x 80	280	65	80
M36 x 80	320	80	80
M42 x 80	345	90	90
M48 x 120	375	90	100
M56 x 140	420	110	110



U BOLTS - GRIP TYPE



U-BOLTS - GRIP TYPE

Nom Pipe Size	Pipe O.D	A	B	C	D	E	R
mm	mm	mm	mm	mm	mm	mm	mm
15	21.3	M8	46	25	30	22	11
20	26.9	M8	56	25	35	27	13.5
25	33.7	M8	61	25	45	37	18.5
32	42.4	M8	71	25	55	47	23.5
40	48.3	M10	85	35	60	50	25
50	60.3	M10	95	35	75	65	32.5
65	76.1	M12	124	45	90	78	39
80	88.9	M16	142	50	105	89	44.5
100	114.3	M16	167	50	135	119	59.5
125	139.7	M16	192	50	160	144	72
150	168.3	M20	225	55	190	170	85
175	193.7	M20	250	55	215	195	97.5
200	219.1	M20	285	55	245	225	112.5
225	244.5	M20	300	55	270	250	125
250	273.0	M20	340	60	300	280	140
300	323.9	M20	390	60	350	330	165
350	355.6	M24	428	65	385	361	180.5
400	406.4	M24	488	65	435	411	205.5
450	457.0	M24	528	70	485	461	230.5
500	508.0	M24	588	70	540	516	258
550	559.0	M24	638	70	590	566	283
600	610.0	M24	688	70	640	616	308

MATERIAL
CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

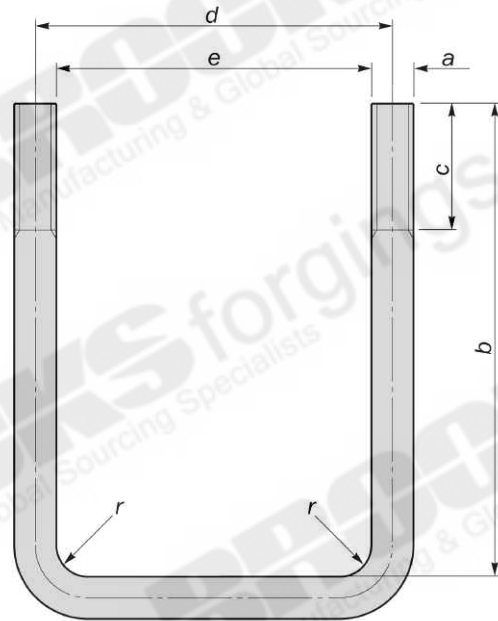
**NON STANDARDS MADE
TO SUIT CUSTOMERS
REQUIREMENTS
M8 - M100**

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U BOLTS - STRAIGHT BACK

**NON STANDARDS MADE
TO SUIT CUSTOMERS
REQUIREMENTS
M8 - M100**



A	B	C	D	E	R
mm	mm	mm	mm	mm	mm
M8	46	25	30	22	11
M8	56	25	35	27	13.5
M8	61	25	45	37	18.5
M8	71	25	55	47	23.5
M10	85	35	60	50	25
M10	95	35	75	65	32.5
M12	124	45	90	78	39
M16	142	50	105	89	44.5
M16	167	50	135	119	59.5
M16	192	50	160	144	72
M20	225	55	190	170	85
M20	250	55	215	195	97.5
M20	285	55	245	225	112.5
M20	300	55	270	250	125
M20	340	60	300	280	140
M20	390	60	350	330	165
M24	428	65	385	361	180.5
M24	488	65	435	411	205.5
M24	528	70	485	461	230.5
M24	588	70	540	516	258
M24	638	70	590	566	283
M24	688	70	640	616	308

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

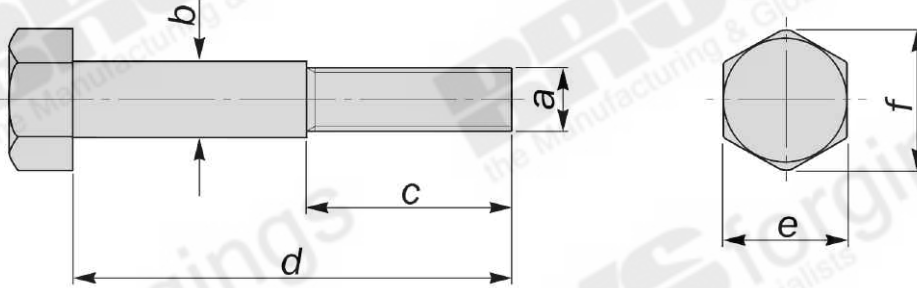
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

U-BOLTS - STRAIGHT BACK

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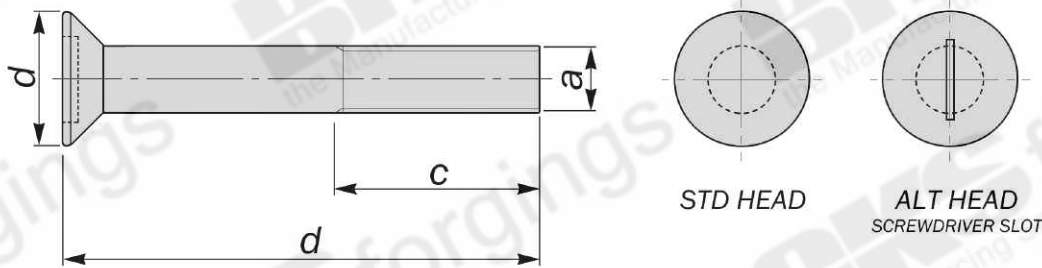
SPECIAL BOLTS AND FASTENERS

SHOULDER BOLTS



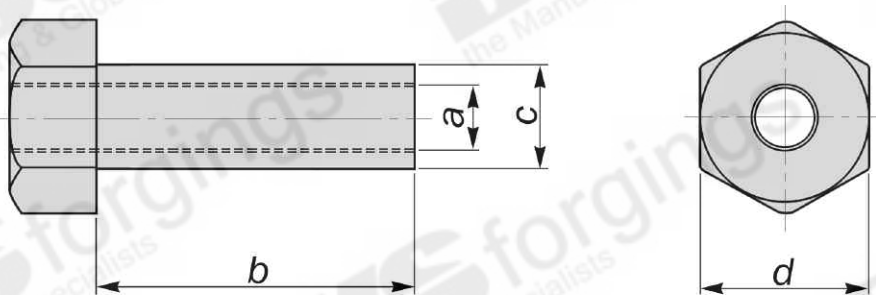
(A) M6 - M48 THREAD DIAMETER

COUNTERSUNK BOLTS



(A) M6 - M48 THREAD DIAMETER

EXTENSION BOLTS



(A) M6 - M48 THREAD DIAMETER

MATERIAL

- CARBON STEELS
- STAINLESS STEELS
- ALLOY STEELS
- B7, 4.6, 5.6, 8.8

FINISH

- SELF COLOUR
- GALVANISED
- ELECTROPLATED
- SHERARDISED
- PTFE COATING

**NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS**

SPECIAL BOLTS & FASTENERS



BROOKS forgings
INDUSTRIAL CATALOGUE

SPECIAL BOLTS AND FASTENERS

We have extensive on-site manufacturing capabilities, enabling us to produce a vast range of special fasteners.



FORGED LENGTHS UP TO 6000MM

THREAD SIZES M6 - M100

THREAD FORMS UNF, UNC, BSF & BSW

We supply the following industries:

- Civil Engineering
- Offshore & Buoyancy
- Petrochemical
- Power Generation
- Naval & Marine
- Defence

SPECIAL BOLTS & FASTENERS

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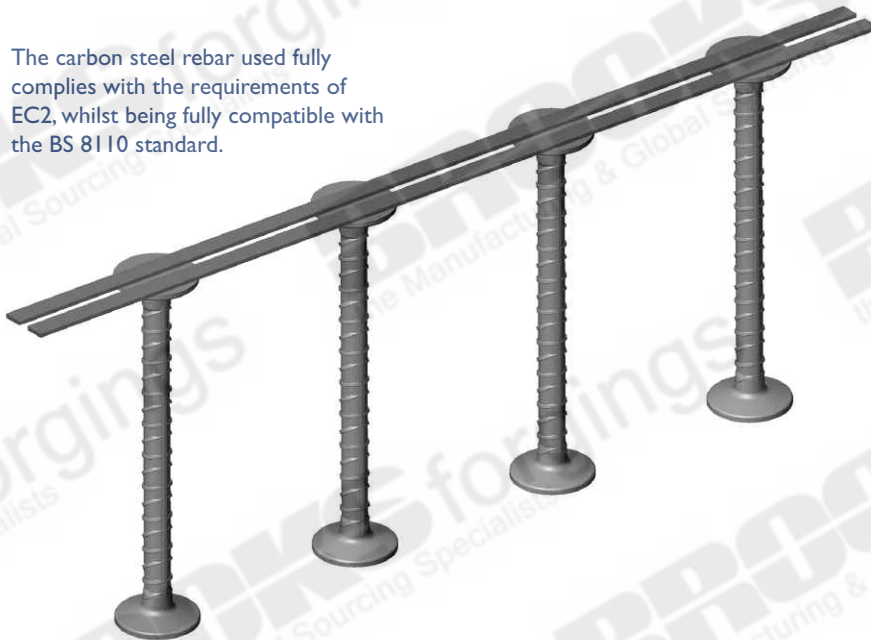


SHEAR STUDS

At Brooks Forgings we manufacture shear studs from Grade B500C ribbed carbon steel reinforcing bars.

Hot forged in the UK using automated horizontal forging lines, with water quenching, to ensure a consistent quality component with a yield strength of 500 N/mm².

The carbon steel rebar used fully complies with the requirements of EC2, whilst being fully compatible with the BS 8110 standard.



SHEAR STUDS

Studs are available in shaft diameters from 10mm to 30mm. Larger diameters can be manufactured on request.

By using on-site fabrication facilities studs can be supplied welded to non-structural rails. Spacing and lengths to customer requirements.

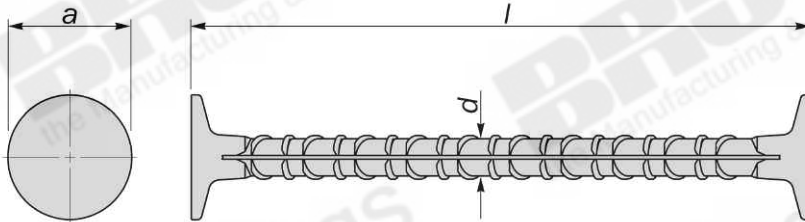
**HOT FORGED AND WATER
QUENCHED STUDS**

**LENGTHS TO REQUIREMENTS
LARGER DIAMETERS ON REQUEST**



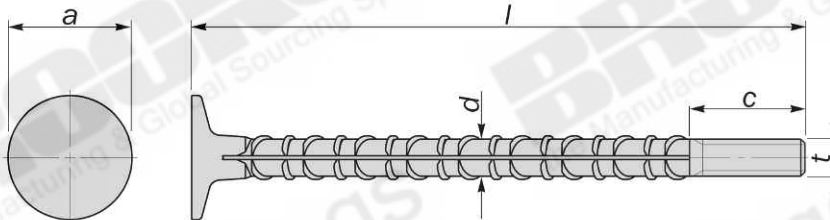


DOUBLE HEADED SHEAR STUDS



D	A	L
mm	mm	mm
10	30	STUD LENGTHS TO CUSTOMER REQUIREMENTS
12	36	
16	48	
20	60	
25	75	

THREADED SHEAR STUDS



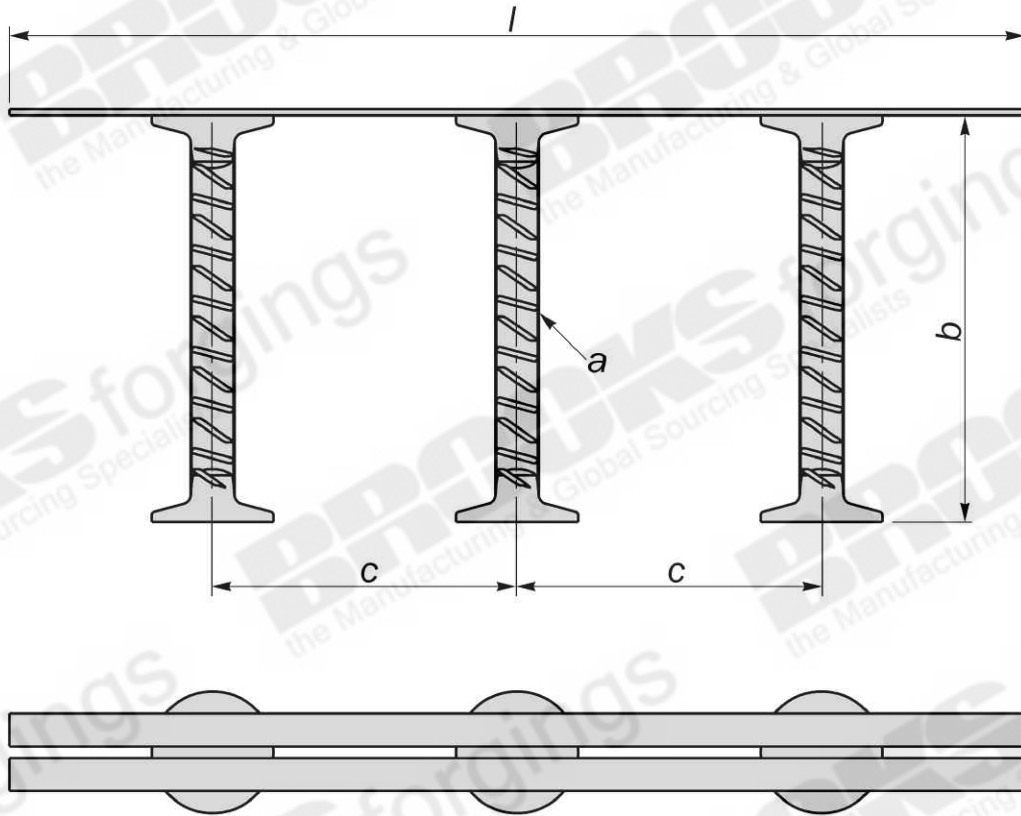
D REBAR DIAMETER	A	C	L
mm	mm	mm	mm
10	30	THREAD LENGTHS TO CUSTOMER REQUIREMENTS	STUD LENGTHS TO CUSTOMER REQUIREMENTS
12	36		
16	48		
20	60		
25	75		

SHEAR STUDS

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SHEAR RAILS



A REBAR DIAMETER	B	C	L
mm	mm	mm	mm
10	STUD LENGTHS TO CUSTOMER REQUIREMENTS	STUD SPACING TO CUSTOMER REQUIREMENTS	RAIL LENGTHS TO CUSTOMER REQUIREMENTS
12			
16			
20			
25			
32*			

*32mm diameter on special request.



**MADE TO SUIT
CUSTOMER
REQUIREMENTS**

SHEAR RAILS

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THREADED REBAR

Alongside our on-site hot forging processes we also have the facilities to thread and bend rebar for foundation applications.

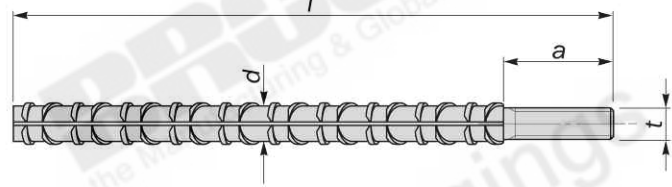
All processes are carried out in accordance to BS ISO 9001:2000.



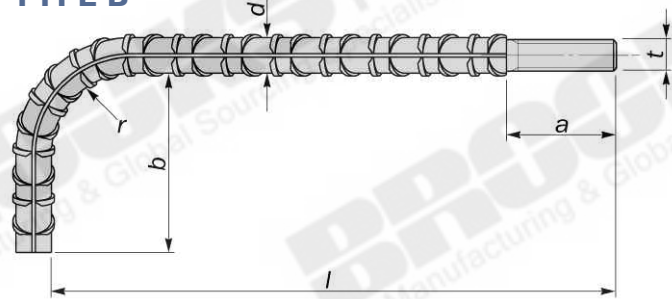
**PLAIN BENT REBAR
ALSO AVAILABLE
ON REQUEST**



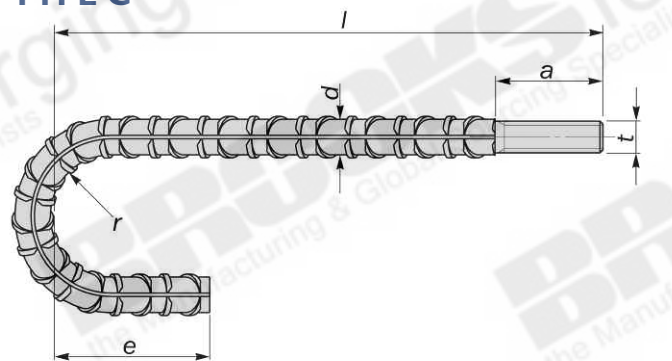
TYPE A



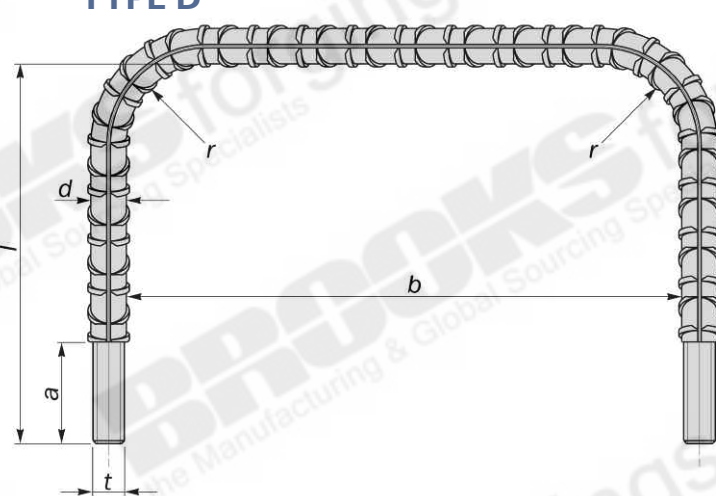
TYPE B



TYPE C



TYPE D

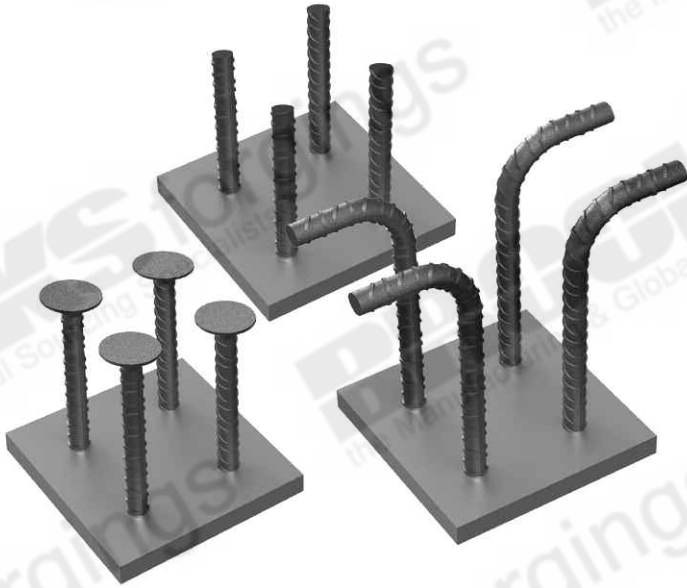




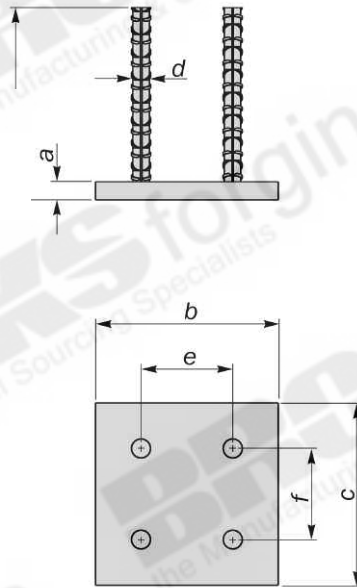
REBAR FASTENING PLATES

Fastening plates are commonly used in construction structure welding, transferring loads to the concrete via rebar studs.

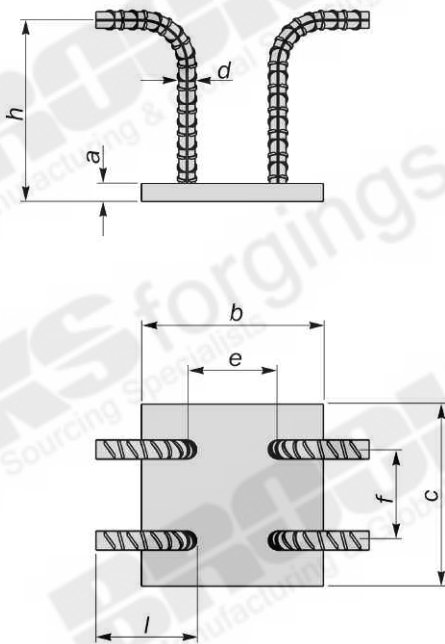
The examples shown can be made to suit customer requirements using on site fabrication processes.



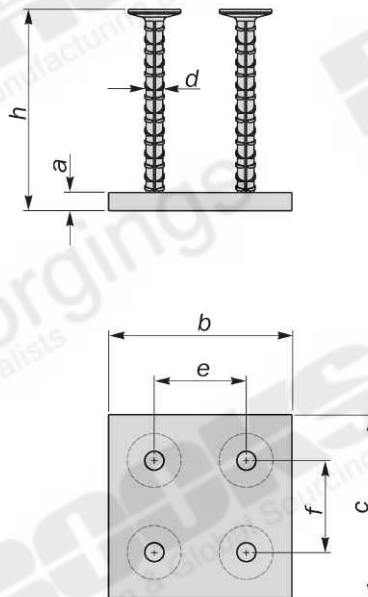
TYPE A



TYPE B



TYPE C

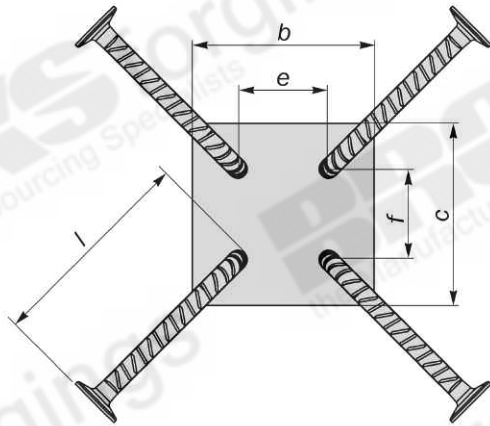
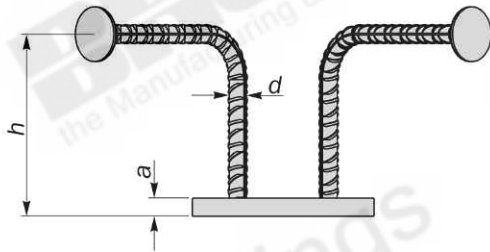


REBAR FASTENING PLATES

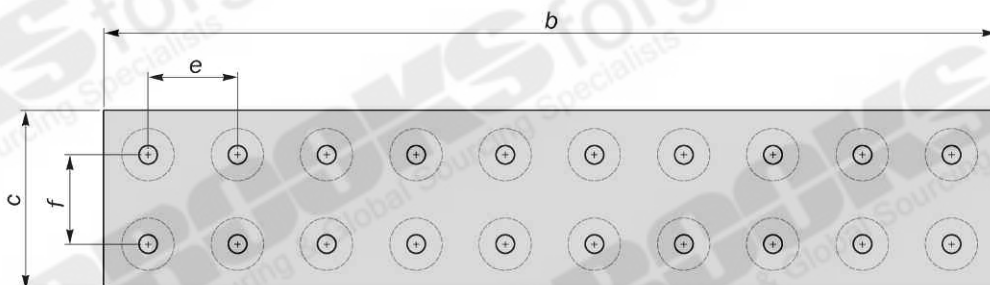
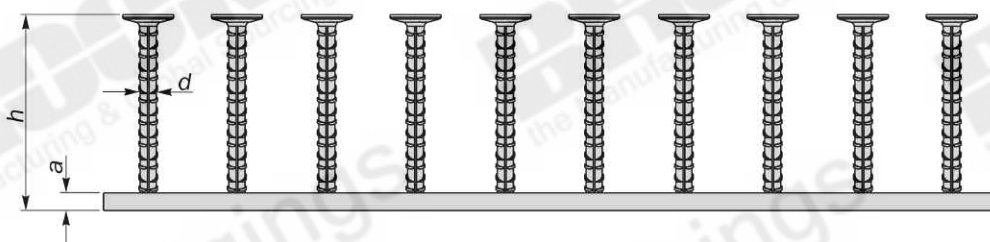


REBAR FASTENING PLATES

TYPE D



TYPE E



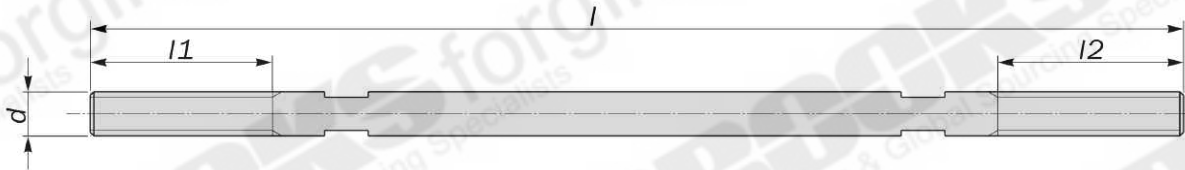
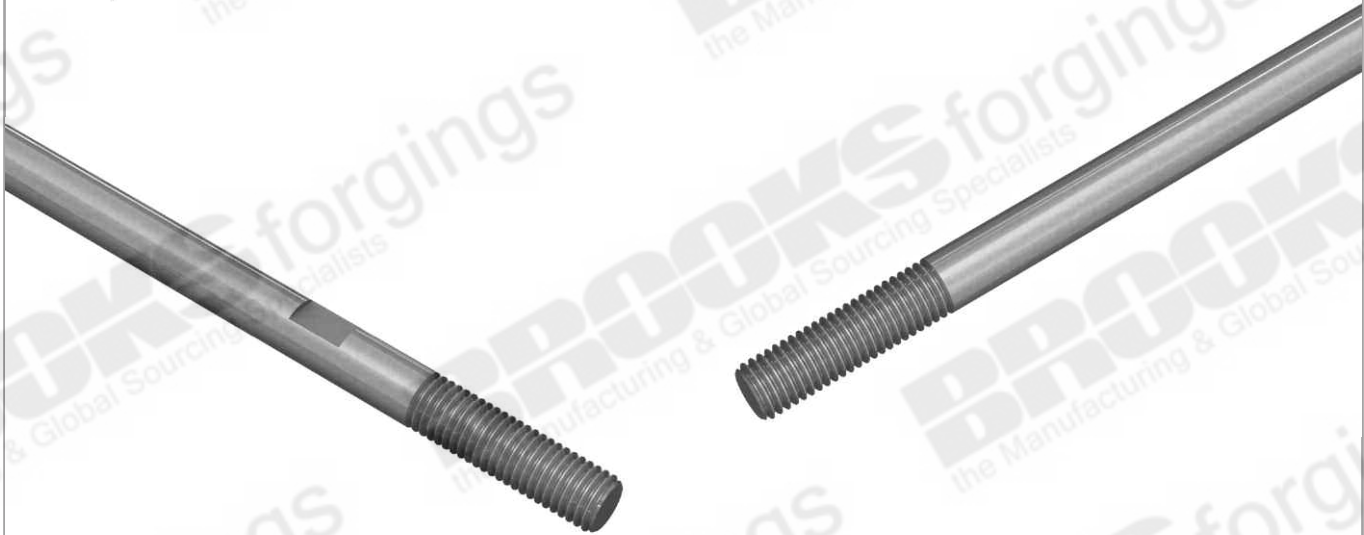
PLAIN & BENT REBAR ALSO AVAILABLE ON REQUEST

REBAR FASTENING PLATES

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TIE BARS



THREADS M8 - M100

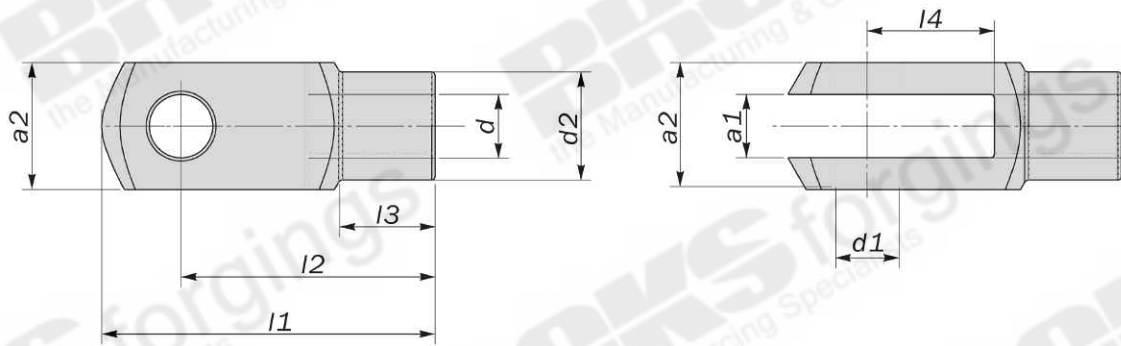
BAR LENGTHS UP TO 6 METRES

MADE TO SUIT CUSTOMERS REQUIREMENTS





BASIC CLEVIS



D	A1	A2	D1	D2	L1	L2	L3	L4
Thread	mm	mm	mm	mm	mm	mm	mm	mm
M8	8	16	8	14	42	32	12	16
M10	10	20	10	18	52	40	15	20
M12	12	24	12	20	62	48	18	24
M16	16	32	16	26	83	64	24	32
M20	20	40	20	34	105	80	30	40
M24	25	50	25	42	132	100	36	50
M30	30	60	30	52	160	120	42	60
M36	35	70	35	60	188	144	54	72
M42	42	85	42	70	232	168	63.5	84

Available in both Right and Left Hand thread.

*Other sizes available to order.



TECHNICAL INFORMATION

M8 - M16: DIN 71 752 / DIN ISO 8140

M18 - M42: Similar to DIN 71 752 / DIN ISO 8140
and according to CETOP standard.

MATERIAL

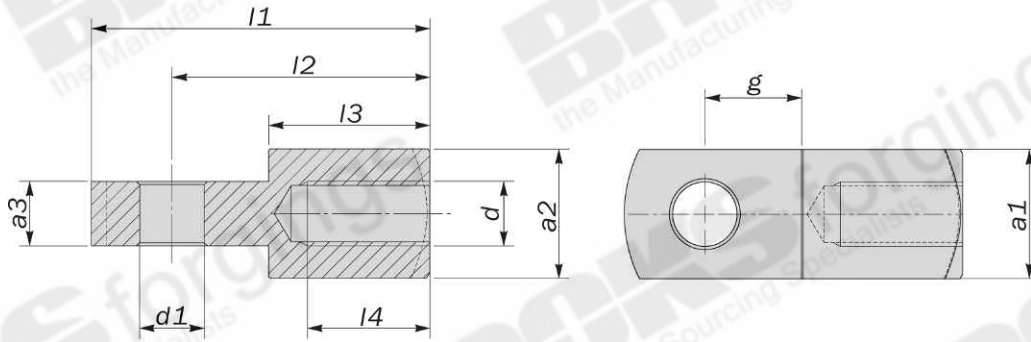
CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



BASIC SPADE CONNECTORS



D	A1	A2	A3	D1	G	L1	L2	L3
Thread	mm	mm	mm	mm	mm	mm	mm	mm
M8	16	16	8	8	12	42	32	20
M10	20	20	10	10	15	52	40	25
M12	24	24	12	12	18	62	48	30
M16	32	32	16	16	24	83	64	40
M20	40	40	20	20	30	105	80	50

Available in both Right and Left Hand thread.

*Other sizes available to order.

MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

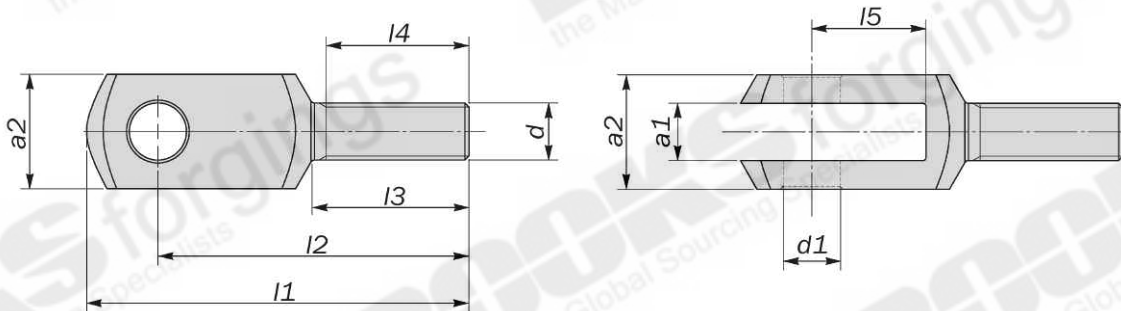
FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**





BASIC CLEVIS - EXTERNAL THREAD



D	A1	A2	D1	L1	L2	L3	L4	L5
Thread	mm	mm	mm	mm	mm	mm	mm	mm
M8	8	16	8	57	47	25	20	36
M10	10	20	10	69	57	30	25	68
M12	12	24	12	82	68	35	30	112
M14	14	27	14	94	78	40	35	171
M16	16	32	16	108	89	45	40	288
M20	20	40	20	134	109	55	50	550

Available in both Right and Left Hand thread.

*Other sizes available to order.

TECHNICAL INFORMATION

Similar to DIN 71 752 / DIN ISO 8140 and according to CETOP standard.

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

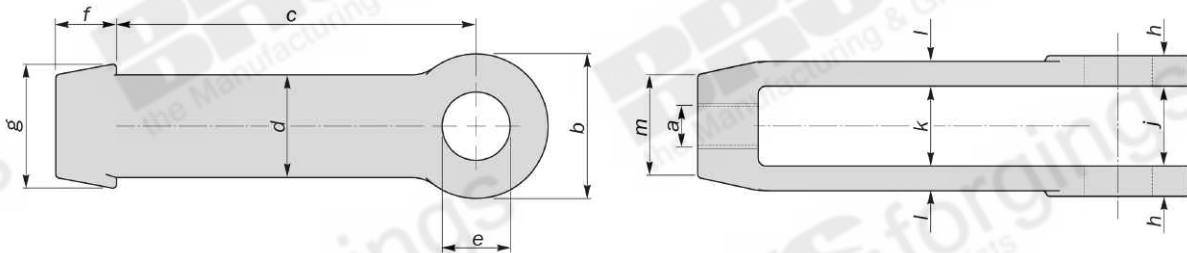
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING





CLEVIS TYPE I - FORGED



CLEVIS TYPE I - FORGED

Size	A	B	C	D	E	F	G	H*	J*	K	L	
reference	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
2	M10	3/8	38	95	27	12	16	33	8	21	21	6.5
2	M12	1/2	38	95	27	14	16	33	8	21	21	6.5
2	M16	5/8	38	95	27	18	16	33	8	21	21	6.5
2.5	M20	3/4	63	103	32	22	28	45	9	31	31	9
2.5	M22	7/8	63	103	32	24	28	45	9	31	31	9
3	M24	1	76	129	38	26	32	56	12	41	41	12
3	M30	1. 1/8	76	129	38	32	32	56	12	41	41	12
3	M33	1. 1/4	76	129	38	36	32	56	12	41	41	12
3.5	M36	1. 1/2	89	152	44	39	41	65	20	48	56	12
4	M42	1. 5/8	102	152	50	45	44	79	22	56	66	12
5	M48	2	127	178	64	51	57	86	28	58	70	16
6	M56	2. 1/4	152	203	76	60	70	118	33	75	89	19
6	M64	2. 1/2	152	203	76	68	70	118	33	75	89	19
6	M72	2. 3/4	152	203	76	76	70	118	33	75	89	19
6	M76	3	152	203	76	76	70	118	33	75	89	19



MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**



ISO 9001



Approved

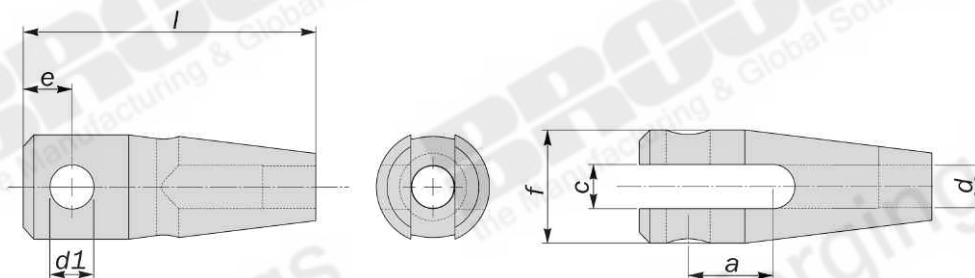


national highway sector schemes

Approved

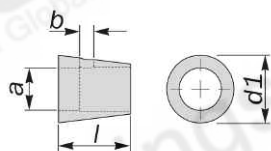
BROOKS forgings
INDUSTRIAL CATALOGUE

CLEVIS TYPE 2 - MACHINED



D	DI	C	A	E	F	L	ADJ
Thread	mm	mm	mm	mm	mm	mm	mm
M10 X 1.50	10	10	20	11.2	25	68.7	20
M12 X 1.75	12	12	24	13.8	32	82.8	24
M16 X 2.00	16	15	32	18.4	40	109.9	32
M20 X 2.50	20	19	40	23.0	50	137.5	40
M24 X 3.00	24	24	48	27.6	60	165.6	48
M27 X 3.00	27	26	54	31.1	70	185.9	54
M30 X 3.50	30	29	60	34.5	75	206.5	60
M33 X 3.50	33	32	66	38.0	80	227.3	66
M36 X 4.00	36	34	72	41.4	90	247.4	72
M39 X 4.00	39	38	78	44.9	100	268.7	78

TAPERED LOCK NUTS



A	B	L	DI
Thread	mm	mm	mm
M10 X 1.50	3.5	17.0	15
M12 X 1.75	3.5	20.4	19
M16 X 2.00	3.5	27.2	25
M20 X 2.50	3.5	34.0	30
M24 X 3.00	4.0	40.8	36
M27 X 3.00	4.0	45.9	42
M30 X 3.50	4.0	51.0	45
M33 X 3.50	5.0	56.1	48
M36 X 4.00	5.0	61.2	54
M39 X 4.00	5.0	66.3	60



MATERIAL
CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

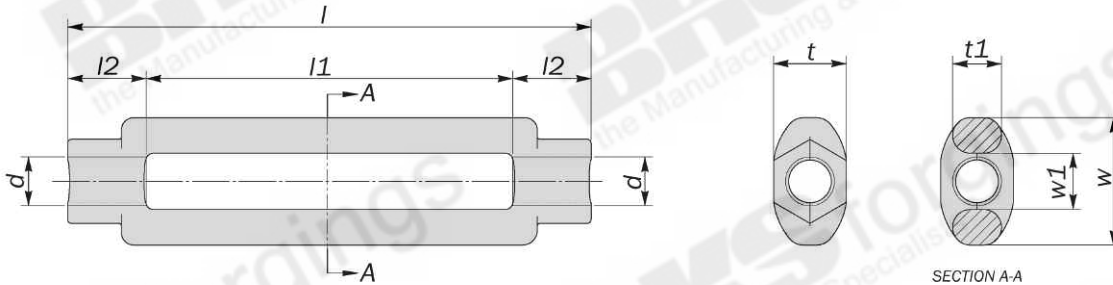
FINISH
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

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HEXAGON TURNBUCKLE - OPEN BODY

- SIMILAR TO DIN 4429



H	L	T1	T	L1	L2	W	W1
Thread	mm	mm	mm	mm	mm	mm	mm
M10	184	10	16.7	150	17	28	12
M12	190	12	18.7	150	20	31	15
M16	202	16	23.7	150	26	41	19
M20	214	20	29.7	150	32	49	23
M24	228	24	35.4	150	39	59	29
M30	256	30	45.4	150	53	67	35
M36*	276	39	59.3	150	63	85	45
M42*	276	39	59.3	150	63	85	45

* PRODUCED FROM 39MM FORGINGS

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



HEXAGON TURNBUCKLE - OPEN BODY



ISO 9001



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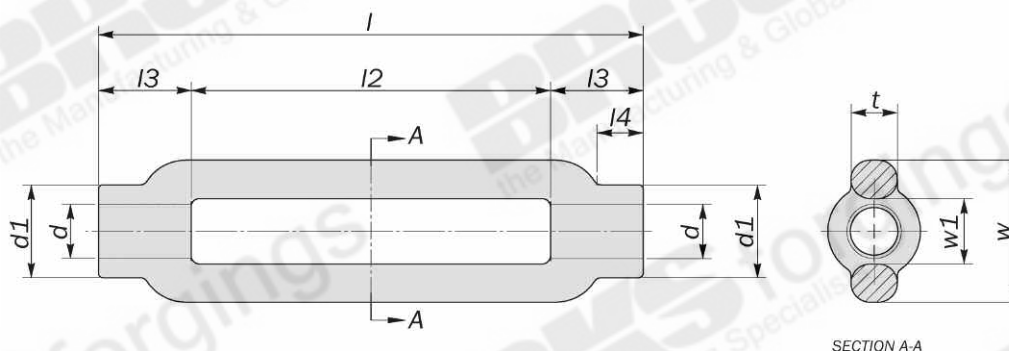
national highway sector schemes

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BROOKS forgings
INDUSTRIAL CATALOGUE

ROUND TURNBUCKLE - OPEN BODY

-TO DIN 1480



D	L	L2	L3	L4	W	WI	T	DI
Thread	mm	mm	mm	mm	mm	mm	mm	mm
M6	110	86	12	6	19	9	6	12
M8	110	80	15	8	23	11	8	15
M10	125	89	18	9	30	14	9	18
M12	125	83	21	11	34	16	11	21
M16	170	116	27	14	42	20	14	27
M20	200	132	34	17	52	24	17	34
M24	255	177	39	20	60	28	20	39
M30	255	165	45	23	74	34	23	45
M36	295	185	55	28	86	40	28	55
M42	330	204	63	32	104	50	32	63
M48	355	199	78	39	135	65	40	80
M56	355	199	78	39	135	65	40	80

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



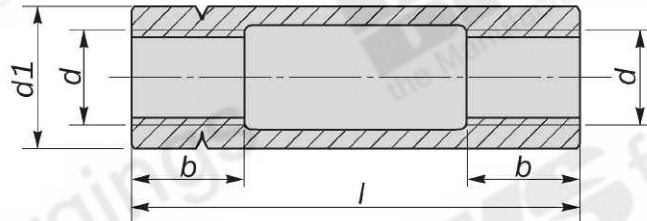
ROUND TURNBUCKLE - OPEN BODY

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HEXAGON TURNBUCKLE - CLOSED BODY

- THREADED LH / RH

- TO DIN 1479



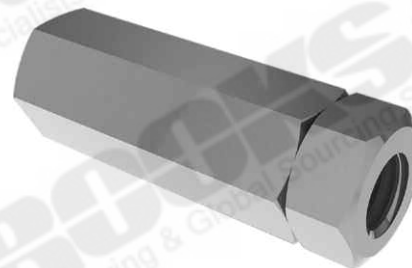
D	B	DI (A/F)	L
Thread	mm	mm	mm
M6	22.5	10	30
M8	25	13	35
M10	33	16	45
M12	40	18	55
M14	55	24	65
M16	55	24	75
M20	24	30	95
M24	29	36	115
M27	32	41	120
M30	36	46	125
M36	40	55	145
M42	44	65	165
M48	48	75	190

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

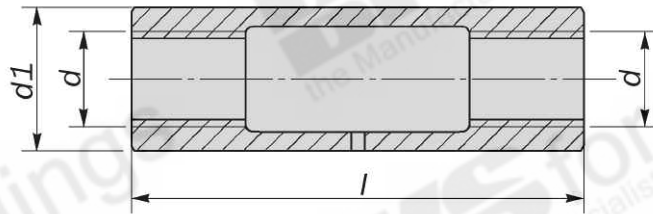
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING





ROUND TURNBUCKLE - CLOSED BODY

-THREADED LH / RH



D	L	D1
Thread	mm	mm
M12	70	18
M16	85	22
M20	144	29
M24	155	35
M30	170	43
M36	180	52
M42	195	60
M48	210	68
M56	230	80
M64	240	91
M76	268	108
M90	290	129
M100	315	143

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



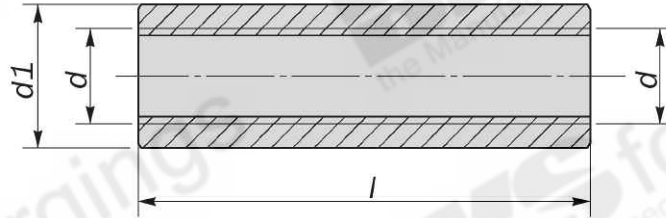
ROUND TURNBUCKLE - CLOSED BODY

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HEXAGON COUPLERS

- THREADED LH OR RH



D	DI (A/F)	L
Thread	mm	mm
M6	10	18
M8	13	24
M10	17	30
M12	19	36
M16	24	48
M20	30	60
M24	36	72
M27	41	81
M30	46	90
M36	55	108
M42	65	150
M48	80	150
M52	80	150
M56	85	150
M64	95	150
M72	SIZES ADVISED AT TIME OF ENQUIRY	200
M76		200

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

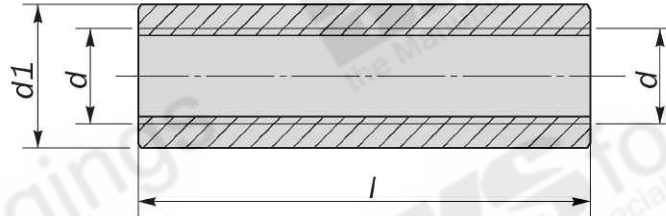
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING





ROUND COUPLERS

- THREADED LH OR RH



D	L	D1
Thread	mm	mm
M12	37	18
M16	45	22
M20	53	29
M24	64	35
M30	75	43
M36	89	52
M42	100	60
M48	115	68
M56	135	80
M64	145	91
M76	165	108
M90	195	129
M100	215	143

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

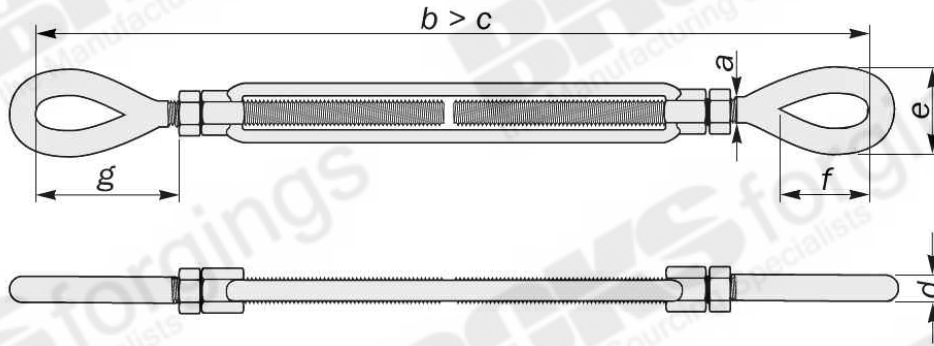
FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING



EYE TO EYE TURNBUCKLES - GALVANISED

- FORMERLY U.S. FEDERAL SPECIFICATION



Thread Size A	Take Up	B min	C max	D mm	E mm	F mm	G mm	SWL Tonnes	Weight Each kgs
	inches								
3/8	6	302	454	9	13	28	65	0.54	0.32
1/2	6	338	490	12	18	36	80	1.00	0.66
1/2	9	414	642	12	18	36	80	1.00	0.76
1/2	12	490	795	12	18	36	80	1.00	0.91
5/8	6	394	546	14	21	43	98	1.59	1.07
5/8	9	470	698	14	21	43	98	1.59	1.31
5/8	12	546	851	14	21	43	98	1.59	1.71
5/8	18	701	1150	14	21	43	98	1.59	1.86
3/4	6	432	584	17	25	53	113	2.36	1.65
3/4	9	508	736	17	25	53	113	2.36	1.95
3/4	12	584	883	17	25	53	113	2.36	2.30
3/4	18	737	1194	17	25	53	113	2.36	2.85
7/8	12	625	854	20	31	59	118	3.27	3.33
7/8	18	778	1121	20	31	59	118	3.27	4.24
1	6	524	676	22	36	74	155	4.54	3.87
1	12	676	981	22	36	74	155	4.54	5.09
1	18	829	1286	22	36	74	155	4.54	6.00
1	24	980	1592	22	36	74	155	4.54	7.52
1. 1/4	12	760	1055	29	45	88	197	6.90	8.12
1. 1/4	18	912	1370	29	45	88	197	6.90	10.40
1. 1/4	24	1064	1665	29	45	88	197	6.90	12.10
1. 1/2	12	823	1129	32	54	105	215	9.71	12.70
1. 1/2	18	975	1434	32	54	105	215	9.71	15.10
1. 1/2	24	1128	1738	32	54	105	215	9.71	17.10
1. 3/4	18	1060	1533	38	60	119	254	12.70	23.10
1. 3/4	24	1213	1838	38	69	119	254	12.70	26.30
2	24	1315	2011	45	69	146	308	16.78	40.70
2. 1/2	24	1486	2098	51	79	165	344	27.22	64.00
2. 3/4	24	1562	2171	57	83	178	381	34.02	88.00

EYE TO EYE TURNBUCKLES



ISO 9001



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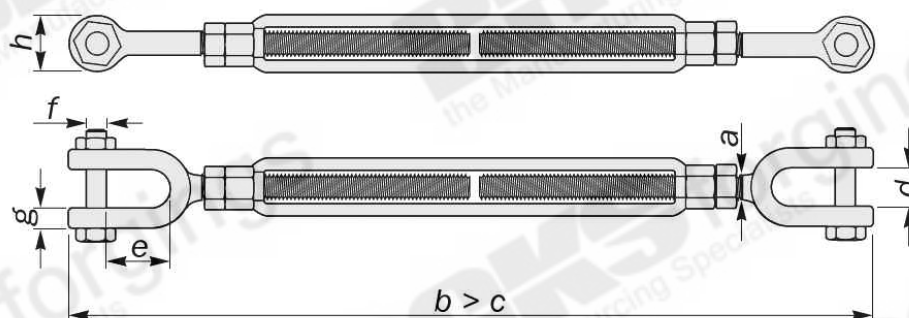
national highway sector schemes

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BROOKS forgings
INDUSTRIAL CATALOGUE

JAW TO JAW TURNBUCKLES - GALVANISED

- FORMERLY U.S. FEDERAL SPECIFICATION



Thread Size A	Take Up	B	C	D	E	F	G	H	SWL	Weight Each
	inches									
3/8	6	302	454	13	22	8	8	21	0.54	0.37
1/2	6	338	490	16	26	9.5	10	25	1.00	0.73
1/2	9	414	642	16	26	9.5	10	25	1.00	0.79
1/2	12	490	795	16	26	9.5	10	25	1.00	0.96
5/8	6	394	546	18	33	13	13	33	1.59	1.37
5/8	9	470	698	18	33	13	13	33	1.59	1.31
5/8	12	546	851	18	33	13	13	33	1.59	1.53
5/8	18	701	1150	18	33	13	13	33	1.59	1.86
3/4	6	432	584	23	38	15.5	16	41	2.36	1.86
3/4	9	508	736	23	38	15.5	16	41	2.36	2.31
3/4	12	584	883	23	38	15.5	16	41	2.36	2.56
3/4	18	737	1194	23	38	15.5	16	41	2.36	3.11
7/8	12	625	854	27	44	19	18	48	3.27	3.71
7/8	18	778	1121	27	44	19	18	48	3.27	4.14
1	6	524	676	30	52	22	20	54	4.54	4.29
1	12	676	981	30	52	22	20	54	4.54	5.07
1	18	829	1286	30	52	22	20	54	4.54	6.62
1	24	980	1592	30	52	22	20	54	4.54	7.85
1. 1/4	12	760	1055	44	73	29	25	67	6.90	9.48
1. 1/4	18	912	1370	44	73	29	25	67	6.90	11.60
1. 1/4	24	1064	1665	44	73	29	25	67	6.90	13.00
1. 1/2	12	823	1129	52	70	35	27	80	9.71	13.60
1. 1/2	18	975	1434	52	70	35	27	80	9.71	14.30
1. 1/2	24	1128	1738	52	70	35	27	80	9.71	18.40
1. 3/4	18	1060	1533	59	85	41	33	90	12.70	25.00
1. 3/4	24	1213	1838	59	85	41	33	90	12.70	28.70
2	24	1315	2011	64	93	51	39	108	16.78	45.40
2. 1/2	24	1486	2098	75	114	57	38	143	27.22	73.00
2. 3/4	24	1562	2171	89	110	70	42	156	34.02	98.00

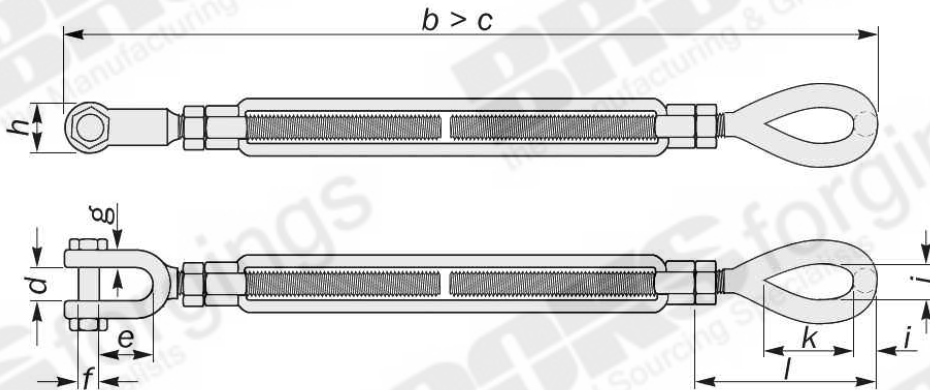
JAW TO JAW TURNBUCKLES

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EYE TO JAW TURNBUCKLES - GALVANISED

- FORMERLY U.S. FEDERAL SPECIFICATION



Thread Size A	Take Up inches	B	C	D	E	F	G	H	I	J	K	L	SWL Tonnes	Weight Each kgs
		min	max	mm	mm	mm	mm	mm	mm	mm	mm	mm		
3/8	6	302	416	13	22	8	8	21	9	13	28	65	0.54	0.34
1/2	6	338	452	16	26	9.5	10	25	12	18	36	80	1.00	0.69
1/2	9	414	585	16	26	9.5	10	25	12	18	36	80	1.00	0.78
1/2	12	490	719	16	26	9.5	10	25	12	18	36	80	1.00	0.93
5/8	6	394	508	18	33	13	13	33	14	21	43	98	1.59	1.07
5/8	9	470	641	18	33	13	13	33	14	21	43	98	1.59	1.39
5/8	12	546	775	18	33	13	13	33	14	21	43	98	1.59	1.71
5/8	18	701	1150	18	33	13	13	33	14	21	43	98	1.59	1.86
3/4	6	432	546	23	38	15.5	16	41	17	25	53	113	2.36	1.76
3/4	9	508	679	23	38	15.5	16	41	17	25	53	113	2.36	1.95
3/4	12	584	813	23	38	15.5	16	41	17	25	53	113	2.36	2.43
3/4	18	737	1080	23	38	15.5	16	41	17	25	53	113	2.36	2.98
7/8	12	625	854	27	44	19	18	48	20	31	59	118	3.27	3.52
7/8	18	778	1121	27	44	19	18	48	20	31	59	118	3.27	4.19
1	6	524	638	30	52	22	20	54	22	36	74	155	4.54	4.05
1	12	676	905	30	52	22	20	54	22	36	74	155	4.54	5.08
1	18	829	1172	30	52	22	20	54	22	36	74	155	4.54	6.03
1	24	980	1437	30	52	22	20	54	22	36	74	155	4.54	7.39
1. 1/4	12	760	989	44	73	29	25	67	29	45	88	197	6.90	8.80
1. 1/4	18	912	1255	44	73	29	25	67	29	45	88	197	6.90	11.00
1. 1/4	24	1064	1521	44	73	29	25	67	29	45	88	197	6.90	12.90
1. 1/2	12	823	1052	52	70	35	27	80	32	54	105	215	9.71	13.10
1. 1/2	18	975	1318	52	70	35	27	80	32	54	105	215	9.71	14.70
1. 1/2	24	1128	1585	52	70	35	27	80	32	54	105	215	9.71	17.80
1. 3/4	18	1060	1403	59	85	41	33	90	38	60	119	254	12.70	22.30
1. 3/4	24	1213	1670	59	85	41	33	90	38	60	119	254	12.70	27.50
2	24	1315	1772	64	93	51	39	108	45	60	146	308	16.78	42.90
2. 1/2	24	1486	1943	75	114	57	38	143	51	79	165	344	27.22	68.00
2. 3/4	24	1562	2019	89	110	70	42	156	57	83	178	381	34.02	91.00

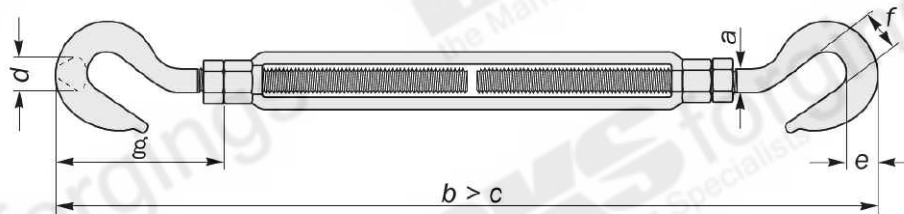
EYE TO JAW TURNBUCKLES

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HOOK TO HOOK TURNBUCKLES - GALVANISED

- FORMERLY U.S. FEDERAL SPECIFICATION



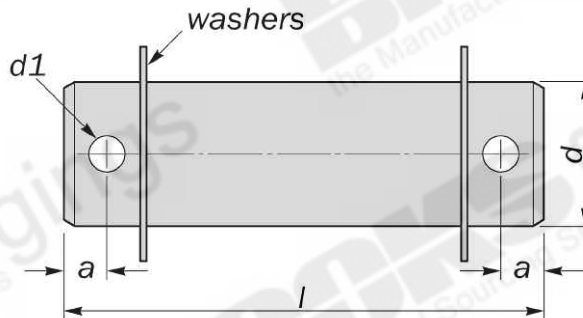
Thread Size A	Take Up inches	B	C	D	E	F	G	SWL Tonnes	Weight Each kgs
		min	max	mm	mm	mm	mm		
3/8	6	302	416	10	15	14	58	0.45	0.32
1/2	6	338	452	13	19	17	72	0.68	0.66
1/2	9	414	585	13	19	17	72	0.68	0.76
1/2	12	490	719	13	19	17	72	0.68	0.91
5/8	6	394	508	16	23	22	90	1.02	1.07
5/8	9	470	641	16	23	22	90	1.02	1.31
5/8	12	546	775	16	23	22	90	1.02	1.71
5/8	18	701	1150	16	23	22	90	1.02	1.86
3/4	6	432	546	20	27	25	98	1.36	1.65
3/4	9	508	679	20	27	25	98	1.36	1.95
3/4	12	584	813	20	27	25	98	1.36	2.30
3/4	18	737	1080	20	27	25	98	1.36	2.85
7/8	12	625	854	23	30	29	126	1.81	3.33
7/8	18	778	1121	23	30	29	126	1.81	4.24
1	6	524	638	23	35	32	144	2.27	3.87
1	12	676	905	25	35	32	144	2.27	5.09
1	18	829	1172	25	35	32	144	2.27	6.00
1	24	980	1437	25	35	32	144	2.27	7.52
1. 1/4	12	760	989	28	37	39	175	3.51	8.12
1. 1/4	18	912	1255	28	37	39	175	3.51	10.40
1. 1/4	24	1064	1521	28	37	39	175	3.51	12.10
1. 1/2	12	823	1052	33	44	47	212	3.4	12.70
1. 1/2	18	975	1318	33	44	47	212	3.4	15.10
1. 1/2	24	1128	1585	33	44	47	212	3.4	17.10

HOOK TO HOOK TURNBUCKLES

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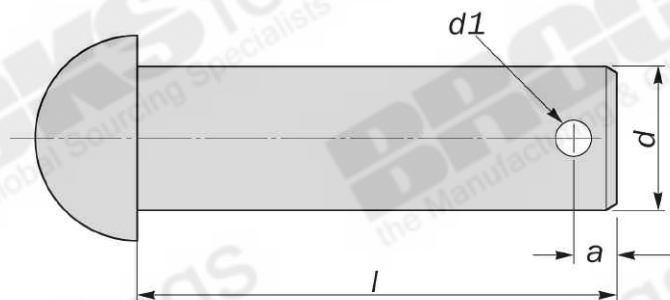
CLEVIS PINS

TYPE A - PIVOT PIN



6MM - 100MM DIA SHANK

TYPE B - DOME HEAD PIN



6MM - 100MM DIA SHANK

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

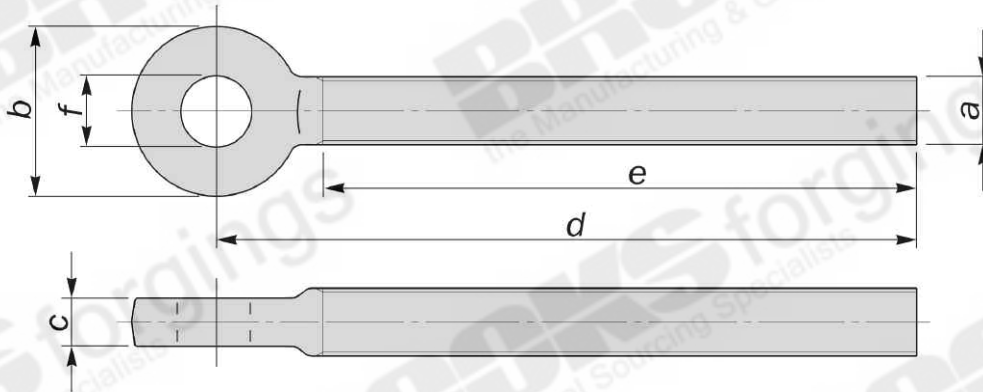
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

**TO SUIT CUSTOMERS
REQUIREMENTS**

**OTHER VARIANTS ON
REQUEST**



EYEBOLTS WITH REDUCED EYE THICKNESS



A		B	C		D		E		F
mm	inches	mm	MIN mm	MAX mm	MIN mm	MAX mm	mm	mm	
M8	5/16	19	5	7	30	800	15	200	To suit customers requirements Dimension "F" is generally drilled out to take corresponding dimension "A" of the same size
M10	3/8	22	6	9	34	900	15	200	
M10	3/8	25	6	9	34	900	15	300	
M12	1/2	25	6	11	40	1000	15	300	
M12	1/2	32	6	11	40	1000	15	450	
M16	5/8	32	7	15	45	1300	20	450	
M16	5/8	38	7	15	45	1300	20	500	
M20	3/4	38	7	19	55	1500	25	500	
M20	3/4	42	7	19	55	1500	25	500	
M20	3/4	50	7	19	60	1500	25	500	
M22	7/8	50	10	21	70	1500	30	500	
M24	1	52	12	22	75	1500	30	650	
M24	-	62	12	22	80	1500	35	650	
M27	-	60	13	25	80	1500	35	800	
M30	1. 1/8	60	13	28	80	1500	38	1000	
M33	1. 1/4	76	14	32	85	1500	40	1000	
M36	1. 3/8	89	16	35	95	2000	40	1500	
M39	1. 1/2	89	18	38	100	2000	45	1500	
M42	1. 5/8	95	20	40	110	2000	50	1500	

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

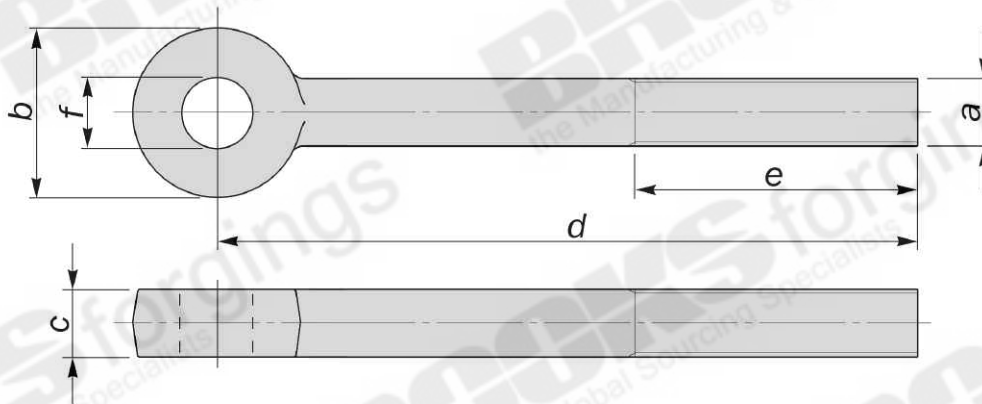
NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

EYEBOLTS WITH REDUCED EYE THICKNESS

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PALM EYEBOLTS - STRAIGHT SIDES



PALM EYEBOLTS - STRAIGHT SIDES

A		B	C	D		E		F
mm	inches	mm	mm	MIN mm	MAX mm	MIN mm	MAX mm	mm
M8	5/16	16	8	30	3000	15	1500	8
M10	3/8	25	10	35	3000	15	1500	10
M12	1/2	26	13	38	3000	18	1500	13
M12	---	34	12	45	3000	18	1500	12
M16	5/8	32	16	45	5500	20	2000	16
M16	5/8	38	16	45	5500	20	2000	16
M20	3/4	42	20	55	5500	25	2000	20
M20	3/4	50	20	60	5500	25	2000	20
M24	1	51	26	65	5500	30	2000	26
M24	---	51	24	65	5500	30	2000	24
M30	1. 1/8	60	30	70	5500	35	2000	30
M33	1. 1/4	70	33	90	5500	40	2000	33
M39	1. 1/2	80	39	95	5500	45	2000	39
M56	2. 1/4	115	56	120	1000	50	800	56
M64	2. 1/2	130	64	140	1000	60	800	64
M72	2. 3/4	150	72	165	1000	75	800	72
M76	3	150	76	170	1000	85	800	76

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS



ISO 9001



Approved

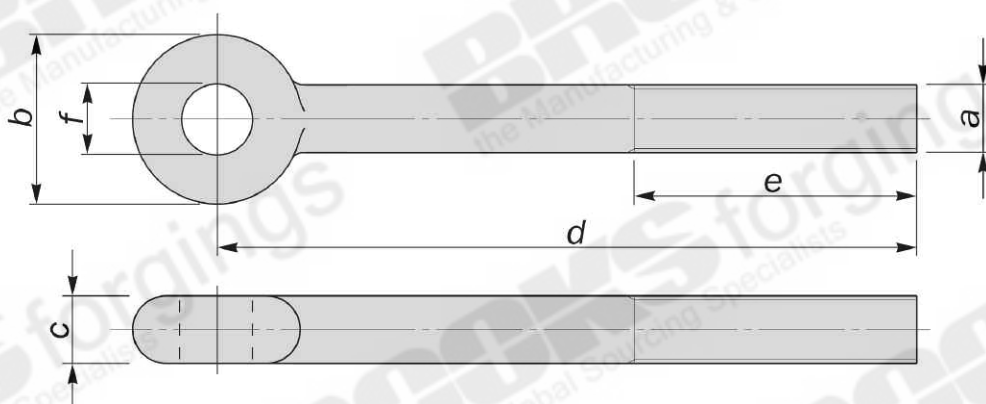


national highway sector schemes

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BROOKS forgings
INDUSTRIAL CATALOGUE

SHACKLE EYEBOLTS - CURVED SIDES



A		B	C	D		E		F
mm	inches	mm	MIN mm	MIN mm	MAX mm	MIN mm	MAX mm	
M6	1/4	16	6	30	3000	15	1500	To suit customers requirements Dimension "F" is generally drilled out to take corresponding dimension "A" of the same size
M8	5/16	19	8	30	3000	15	1500	
M10	3/8	19	10	35	3000	15	1500	
M10	3/8	22	10	35	3000	15	1500	
M12	1/2	32	13	40	3000	18	1500	
M16	5/8	40	16	45	5500	20	2000	
M20	3/4	38	20	50	5500	25	2000	
M22	7/8	52	22	60	5500	25	2000	
M24	1	56	26	65	5500	30	2000	
M27	1.18	64	28	68	5500	30	2000	
---	1.1/4	60	32	70	5500	35	2000	
M36	1.1/2	89	38	100	5500	45	2000	
M42	1.5/8	95	42	115	5500	48	2000	
M45	1.3/4	102	45	120	5500	50	2000	
M48	2	115	51	135	5500	60	2000	

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

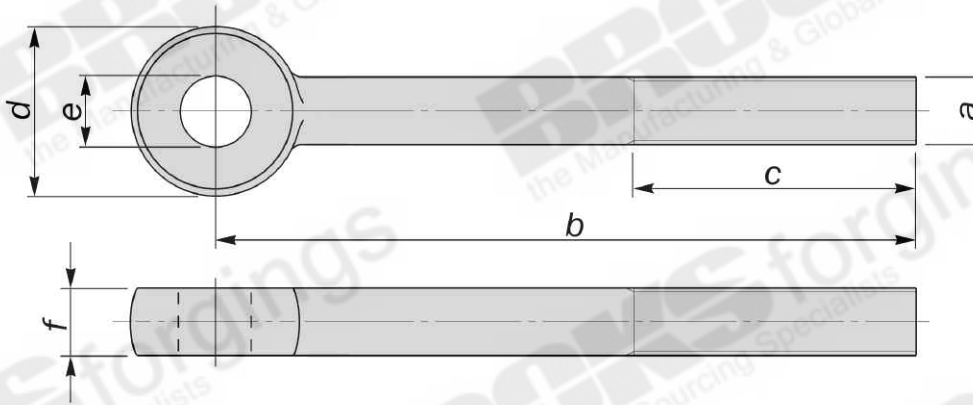
NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

SHACKLE EYEBOLTS - CURVED SIDES

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DIN 444 EYEBOLTS

- TO DIN 444 : 1983 TYPE A



A	B		C	D		E	F	
	MIN mm	MAX mm		MIN mm	MAX mm		MIN mm	MAX mm
M6	35	90	18	12.9	14	6	8.52	9
M8	40	125	22	16.9	18	8	10.30	11
M8	126	140	28	16.9	18	8	10.30	11
M10	45	125	26	18.7	20	10	13.30	14
M10	126	150	32	18.7	20	10	13.30	14
M12	55	125	30	23.7	25	12	16.30	17
M12	126	200	36	23.7	25	12	16.30	17
M12	201	260	49	23.7	25	12	16.30	17
M16	70	125	38	30.4	32	16	18.16	19
M16	126	200	44	30.4	32	16	18.16	19
M16	201	260	57	30.4	32	16	18.16	19
M20	100	125	46	38.4	40	18	23.16	24
M20	126	200	52	38.4	40	18	23.16	24
M20	201	260	65	38.4	40	18	23.16	24
M24	100	125	54	43.4	45	22	27.16	28
M24	126	200	60	43.4	45	22	27.16	28
M24	201	260	73	43.4	45	22	27.16	28
M30	150	200	72	53.1	55	28	33.00	34
M30	201	300	85	53.1	55	28	33.00	34
M36	160	200	84	63.1	65	32	40.00	41
M36	201	300	97	63.1	65	32	40.00	41
M39	160	200	90	68.1	70	35	45.00	46
M39	201	300	103	68.1	70	35	45.00	46

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS



ISO 9001



Approved

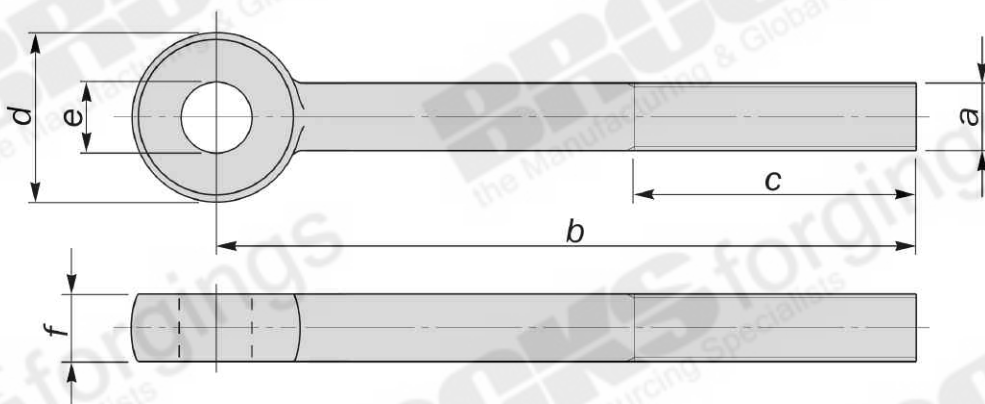


national highway sector schemes

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DIN 444 EYEBOLTS

-TO DIN 444 : 1983 TYPE B & C



A	B		C	D		E	F	
mm	MIN mm	MAX mm	mm	MIN mm	MAX mm	mm	MIN mm	MAX mm
M6	35	90	18	13.57	14	6	6.85	7
M8	40	125	22	17.57	18	8	8.85	9
M8	126	140	28	17.57	18	8	8.85	9
M10	45	125	26	19.48	20	10	11.82	12
M10	126	150	32	19.48	20	10	11.82	12
M12	55	125	30	24.48	25	12	13.82	14
M12	126	200	36	24.48	25	12	13.82	14
M12	201	260	49	24.48	25	12	13.82	14
M16	70	125	38	31.38	32	16	16.82	17
M16	126	200	44	31.38	32	16	16.82	17
M16	201	260	57	31.38	32	16	16.82	17
M20	100	125	46	39.38	40	18	21.79	22
M20	126	200	52	39.38	40	18	21.79	22
M20	201	260	65	39.38	40	18	21.79	22
M24	100	125	54	44.38	45	22	24.79	25
M24	126	200	60	44.38	45	22	24.79	25
M24	201	260	73	44.38	45	22	24.79	25
M30	150	200	72	54.26	55	28	29.79	30
M30	201	300	85	54.26	55	28	29.79	30
M36	160	200	84	64.26	65	32	37.75	38
M36	201	300	97	64.26	65	32	37.75	38
M39	160	200	90	69.26	70	35	40.75	41
M39	201	300	103	69.26	70	35	40.75	41

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

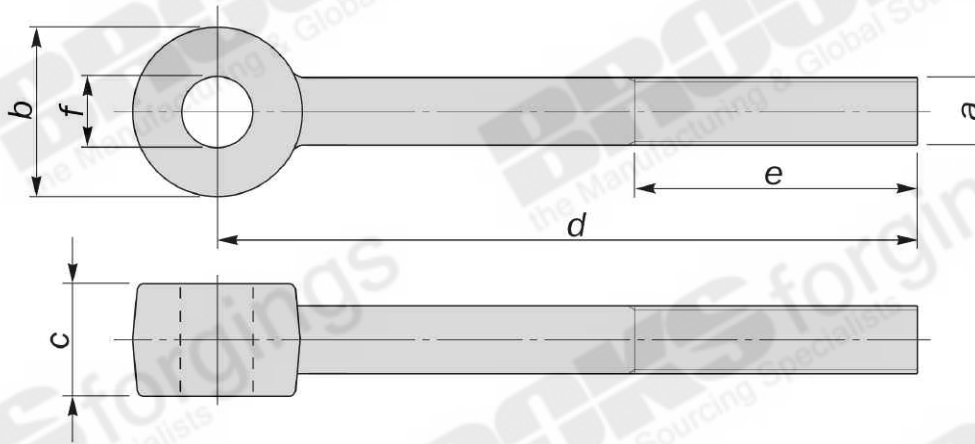
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

DIN 444 EYEBOLTS

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SWIVEL EYEBOLTS - INCREASED EYE THICKNESS



THREADS M6 - M12 (1/4" - 1/2")

A		B	C	D		E		F
mm	inches	mm	MIN mm	MIN mm	MAX mm	MIN mm	MAX mm	
M6	1/4	19	8	30	160	15	140	To suit customers requirements Dimension "F" is generally drilled out to take corresponding dimension "A" of the same size
M6	1/4	25	10	35	160	15	140	
M6	1/4	25	13	35	160	15	140	
M8	5/16	25	10	35	160	15	140	
M8	5/16	25	13	35	160	15	140	
M8	5/16	38	16	40	165	15	135	
M8	5/16	42	20	45	170	15	140	
M8	5/16	51	25	50	160	15	140	
M10	3/8	25	13	35	160	15	140	
M10	3/8	32	13	40	165	15	140	
M10	3/8	38	16	45	165	15	140	
M10	3/8	42	20	45	170	15	140	
M10	3/8	51	22	50	175	15	140	
M10	3/8	51	25	50	175	15	140	
M10	3/8	60	30	55	180	15	140	
M12	1/2	25	14	40	210	20	190	
M12	1/2	38	16	50	220	20	190	
M12	1/2	42	20	55	220	20	190	
M12	1/2	51	22	55	225	20	190	
M12	1/2	51	25	55	225	20	190	
M12	1/2	62	24	60	230	20	190	
M12	1/2	60	30	60	230	20	190	

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

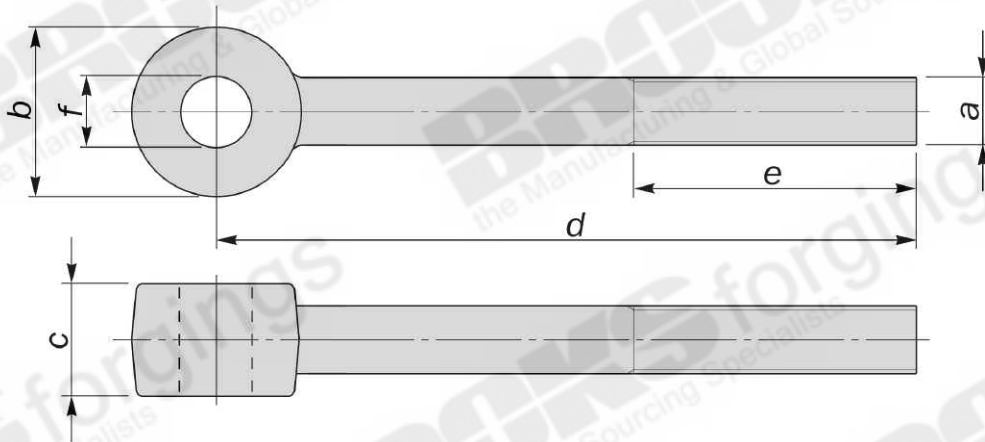
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

SWIVEL EYEBOLTS - INCREASED EYE THICKNESS



SWIVEL EYEBOLTS - INCREASED EYE THICKNESS



THREADS M16 - M36 (5/8" - 1.3/8")

A		B	C	D		E		F
mm	inches	mm	MIN mm	MIN mm	MAX mm	MIN mm	MAX mm	
M16	5/8	35	17	45	1500	20	1400	To suit customers requirements Dimension "F" is generally drilled out to take corresponding dimension "A" of the same size
M16	5/8	38	19	50	270	20	240	
M16	5/8	42	20	50	270	20	240	
M16	5/8	51	25	55	275	20	240	
M16	5/8	62	24	60	280	20	240	
M16	5/8	60	30	60	280	20	240	
M16	5/8	60	32	60	280	20	240	
M20	3/4	45	25	52	1500	25	1400	
M20	3/4	51	25	55	275	25	240	
M20	3/4	62	24	60	280	25	240	
M20	3/4	60	30	60	280	25	240	
M20	3/4	60	32	60	280	25	240	
M24	---	51	28.5	60	1500	25	1400	
M24	1	60	30	65	280	25	240	
M24	1	60	32	70	280	25	240	
M30	1. 1/8	60	32	70	280	30	240	
M30	1. 1/8	60	38	70	280	30	240	
M33	1. 1/4	60	38	75	280	35	240	
M36	1. 3/8	60	38	80	1500	40	1400	

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

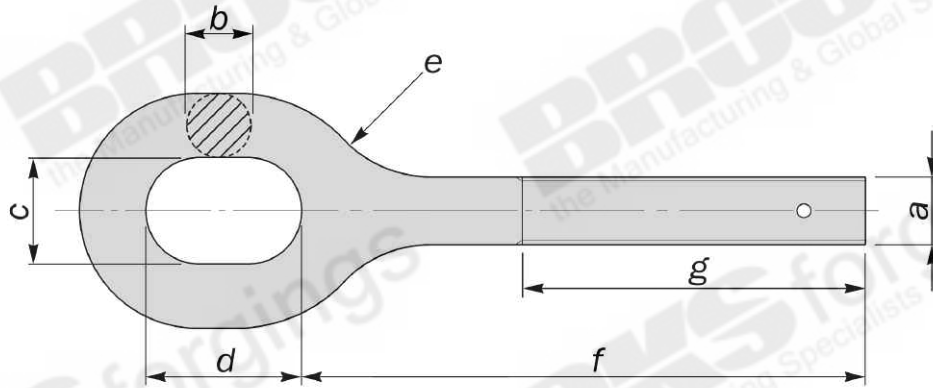
SWIVEL EYEBOLTS - INCREASED EYE THICKNESS

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LIFT SUSPENSION EYEBOLTS - OVAL

- TO BS 529 : 1944 PART 2



A		WIRE ROPE CIRC	SWL		PROOF LOAD		B	C	D	E	F	G	WEIGHT EACH
inches	mm	inches	cwt	kgs	cwt	kgs	inches	inches	inches	inches	inches	inches	kgs
3/8	M10	1	4	203	8	406	3/8	5/8	7/8	5/8	6 12	4. 1/2 9	0.16 0.25
1/2	M12	1. 1/4	8	406	16	812	1/2	3/4	1. 1/8	3/4	12 18 24	9 13. 1/2 18	0.43 0.59 0.76
5/8	M16	1. 1/2 - 1. 3/4	13	660	26	1321	5/8	1	1. 5/8	1	18 24 30	13. 1/2 18 22. 1/2	0.91 1.14 1.36
3/4	M20	2	20	1016	40	2032	3/4	1. 1/4	1. 3/4	1. 1/4	18 24 30	13. 1/2 18 22. 1/2	1.42 1.76 2.10
7/8	M22	2. 1/4 - 2. 1/2	28	1422	56	2844	7/8	1. 1/2	2. 1/4	1. 1/2	18 24 30	13. 1/2 18 22. 1/2	2.04 2.50 2.95
1	M24	2. 3/4	37	1880	74	3759	1	1. 5/8	2. 1/2	1. 5/8	18 24 30	13. 1/2 18 22. 1/2	2.84 3.40 3.97
1. 1/8	M27	3	47	2388	94	4775	1. 1/8	1. 3/4	2. 3/4	1. 3/4	18 24 30	13. 1/2 18 22. 1/2	3.86 4.65 5.45

MATERIAL

BS970 080A27 (EN5A)

FINISH

**SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING**

**NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS**

LIFT SUSPENSION EYEBOLTS - OVAL



ISO 9001



Approved

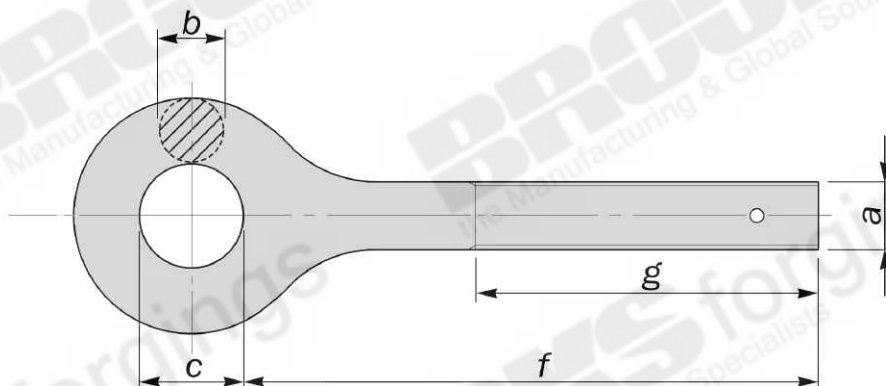


national highway sector schemes

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LIFT SUSPENSION EYEBOLTS - ROUND

-TO BS 5655 : 1983 PART 8



A	WIRE ROPE DIA	SWL	PROOF FORCE	MINIMUM BREAKING FORCE	B	C	F	G	WEIGHT EACH
mm	mm	tonnes	kn	kn	mm	mm	mm	mm	kgs
M10	6 - 6.5	0.20	4.12	20.60	10	15	150 300	115 230	0.13 0.22
M12	8	0.31	6.23	31.15	12	15	150 300	115 230	0.18 0.31
M16	10	0.49	9.73	48.65	15	21	300 450 600	230 345 460	0.64 0.88 1.11
M16	11	0.60	11.78	58.90	17	21	450 600 750	230 345 460	0.64 0.88 1.11
M20	13	0.83	16.45	82.28	20	24	450 600 750	345 460 575	1.45 1.82 2.15
M24	16	1.27	25.00	125.00	24	27	450 600 750	345 460 575	2.09 2.65 3.18
M30	19	1.79	35.17	175.85	29	34	450 600 750	345 460 575	3.49 4.32 5.15
M30	22	2.40	47.17	235.85	33	37	450 600 750	345 460 575	3.55 4.38 5.21

MATERIAL

BS970 080A27 (EN5A)

FINISH

**SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING**

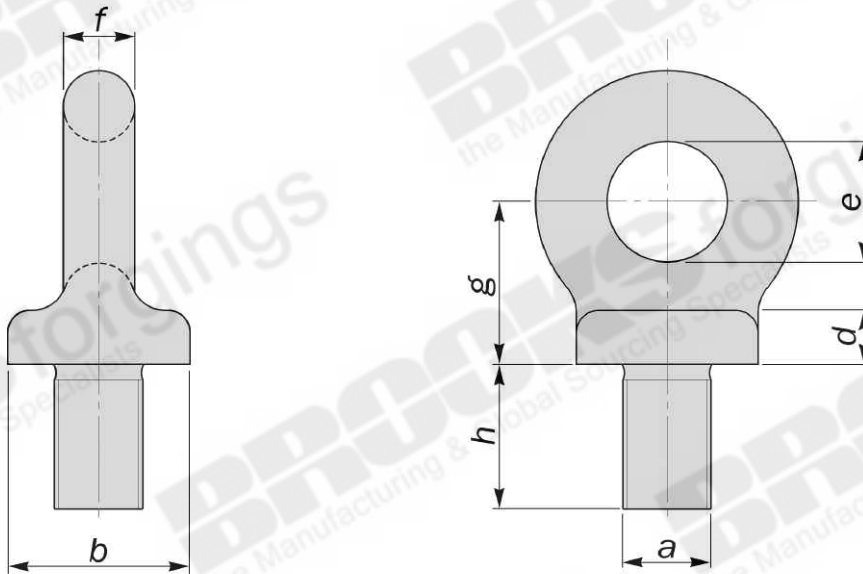
**NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS**

LIFT SUSPENSION EYEBOLTS - ROUND

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COLLARED EYEBOLTS - IMPERIAL

- TO BS 529 : 1944 PART I



A	B	D	E	F	G	H	SWL		Weight Each
							TONNES	CWT	kgs
3/8	21	7	14	9	19	17	0	5	0.1
1/2	28	10	19	11	25	22	0	10	0.1
5/8	36	12	24	14	32	28	0	18	0.3
3/4	43	14	28	17	38	33	1	8	0.5
7/8	50	17	33	20	44	39	2	0	0.6
1	57	19	38	22	51	44	2	15	1.1
1. 1/8	64	21	42	25	57	50	3	10	1.6
1. 1/4	71	24	48	28	64	55	4	10	2.1
1. 3/8	85	28	57	33	76	67	5	10	3.6
1. 1/2	85	28	57	33	76	67	6	10	3.6
1. 3/4	101	33	67	39	89	77	9	0	5.6
2	115	38	76	44	102	89	12	0	9.1
2. 1/4	128	42	85	50	115	101	15	0	15.0
2. 1/2	143	48	95	55	127	111	20	0	17.7
3	172	57	115	67	152	133	30	0	30.4

MATERIAL

**BS970 080A27 (EN5A)
STAINLESS STEELS
ALLOY STEELS
B7**

FINISH

**SELF COLOUR
GALVANISED
ELECTROPLATED
CHEMICAL BLACK
SHERARDISED**

**SWL IS SHOWN FOR
VERTICAL LIFT**

**LONGER SHANK AVAILABLE
UPON REQUEST**

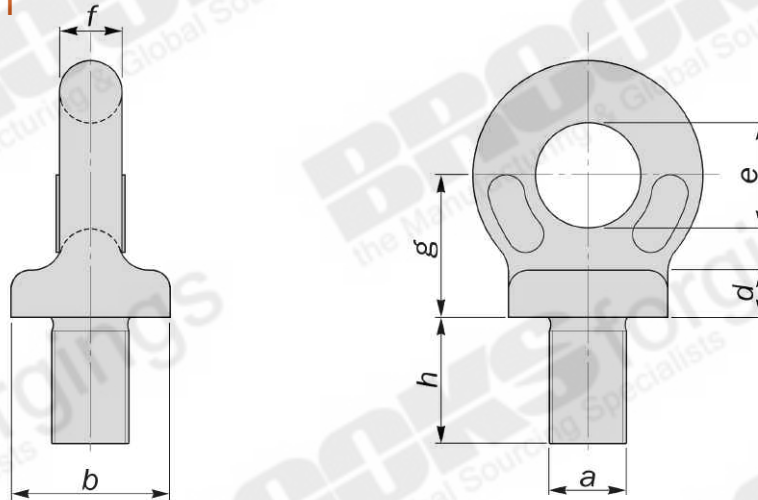
COLLARED EYEBOLTS - IMPERIAL

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COLLARED EYEBOLTS - METRIC

-TO BS 4278 TABLE I



A	B	D	E	F	G	H	SWL 1968	SWL 1984	Weight Each
mm	mm	mm	mm	mm	mm	mm	tonnes	tonnes	kgs
M8	22	7	15	9	20	18	0.15	---	0.06
M10	22	7	15	9	20	18	0.25	---	0.07
M12	22	7	15	9	20	18	0.32	0.40	0.07
M14	29	10	20	12	26	23	0.50	---	0.15
M16	29	10	20	12	26	23	0.63	0.80	0.16
M18	36	12	24	14	32	28	1.00	---	0.28
M20	40	14	27	16	36	32	1.25	1.60	0.44
M22	45	15	30	18	40	35	1.60	---	0.56
M24	52	17	35	21	46	40	2.00	2.50	0.84
M27	58	20	39	23	52	46	2.50	---	1.14
M30	65	22	44	26	58	51	3.20	4.00	1.66
M33	72	24	48	29	64	56	4.00	---	2.24
M36	81	27	54	32	72	63	5.00	6.30	3.17
M39	90	30	60	36	80	70	6.30	---	3.92
M42	90	30	60	36	80	70	7.00	8.00	3.92
M45	101	34	68	40	90	79	8.00	---	6.00
M48	101	34	68	40	90	79	9.00	10.00	6.00
M52	115	38	76	46	102	89	10.00	12.50	9.00
M56	128	43	86	51	114	100	12.50	16.00	13.00
M64	144	48	96	58	128	112	16.00	20.00	17.50
M70	172	54	108	65	144	126	20.00	---	31.00
M72	172	54	108	65	144	126	22.00	25.00	31.00
M76	172	54	108	65	144	126	25.00	---	31.00

MATERIAL

BS970 080A27 (EN5A)
STAINLESS STEELS
ALLOY STEELS
B7

FINISH

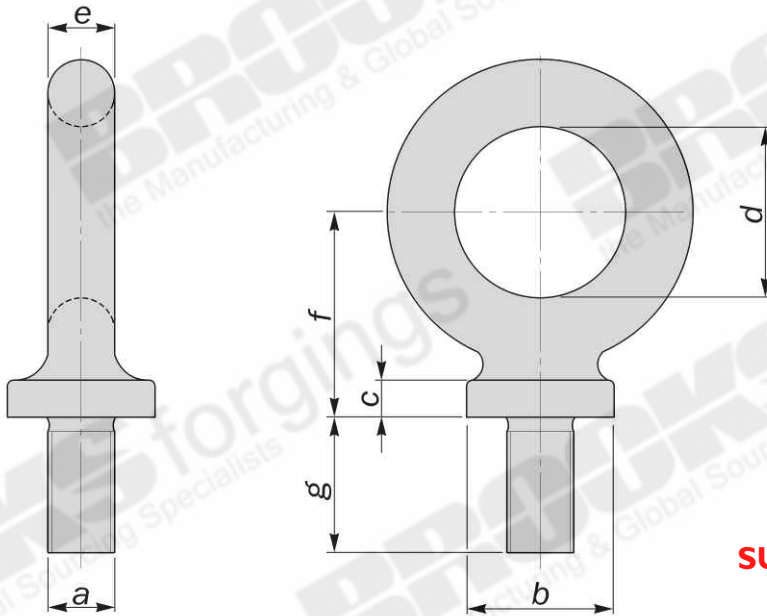
SELF COLOUR
GALVANISED
ELECTROPLATED
CHEMICAL BLACK
SHERARDISED

**SWL IS SHOWN FOR
VERTICAL LIFT**

**LONGER SHANK AVAILABLE
UPON REQUEST**



DYNAMO EYEBOLTS - COMMERCIAL PATTERN



MATERIAL

- BS970 080A27 (EN5A)**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7**

FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**

SUITABLE FOR VERTICAL LIFTS ONLY

A	B	C	D	E	F	G	G	SWL	Weight Each	
Metric Imperial	DIA		DIA	DIA		STD Shank	Long Shank	Vertical	STD	LONG
inches	mm	mm	mm	mm	mm	mm	mm	kg/CWT	kg	kg
M6	19	6	22	10	27	19	101	60	0.08	0.10
1/4	3/4	1/4	7/8	3/8	1. 1/16	3/4	4	2	0.08	0.10
M8	19	6	22	10	27	19	101	95	0.08	0.10
5/16	3/4	1/4	7/8	3/8	1. 1/16	3/4	4	3	0.08	0.10
M10	19	6	22	10	27	19	101	160	0.08	0.10
3/8	3/4	1/4	7/8	3/8	1. 1/16	3/4	4	5	0.08	0.10
M12	25	8	28	11	35	26	101	320	0.14	0.30
1/2	1	5/16	1. 1/8	7/16	1. 3/8	1	4	10	0.14	0.30
M16	28	10	32	13	41	28	115	630	0.24	0.45
5/8	1. 1/8	3/8	1. 1/4	1/2	1. 5/8	1. 1/8	4. 1/2	16	0.24	0.45
M20	36	13	40	17	54	32	127	1250	0.40	0.70
3/4	1. 3/8	1/2	1. 5/8	11/16	2. 1/8	1. 1/4	5	24	0.40	0.70
M22	38	13	44	17	57	41	127	1600	0.62	1.00
7/8	1. 1/2	1/2	1. 3/4	11/16	2. 1/4	1. 5/8	5	32	0.62	1.00
M24	41	13	51	21	64	45	127	2000	0.80	1.10
1	1. 5/8	1/2	2	13/16	2. 1/2	1. 3/4	5	44	0.80	1.10
M27	54	16	60	26	73	51	152	2500	1.76	2.20
1. 1/8	2. 1/8	5/8	2. 3/8	1	2. 7/8	2	6	56	1.76	2.20
M30	54	16	60	26	73	51	152	3200	1.70	2.20
1. 1/4	2. 1/8	5/8	2. 3/8	1	2. 7/8	2	6	70	1.70	2.20
M33	57	18	76	28	89	57	152	4000	2.60	3.20
1. 3/8	2. 1/4	11/16	3	1. 1/8	3. 1/2	2. 1/4	6	85	2.60	3.20
M36	57	18	76	28	89	57	152	5000	2.65	3.50
1. 1/2	2. 1/4	11/16	3	1. 1/8	3. 1/2	2. 1/4	6	100	2.65	3.50

DYNAMO EYEBOLTS - COMMERCIAL PATTERN

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ISO 9001



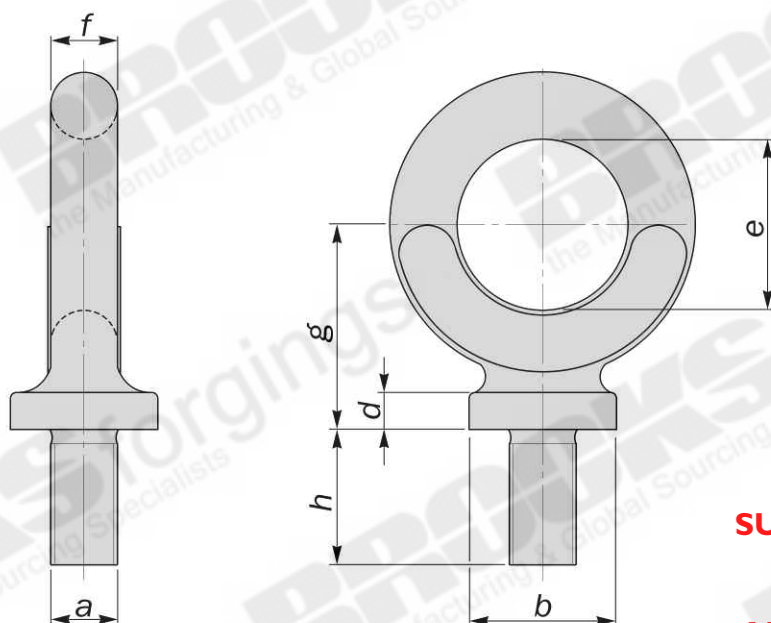
Approved



national highway sector schemes

Approved

DYNAMO EYEBOLTS



MATERIAL

BS970 080A27 (EN5A)

STAINLESS STEELS

ALLOY STEELS

B7

FINISH

SELF COLOUR

GALVANISED

ELECTROPLATED

SHERARDISED

PTFE COATING

**SUITABLE FOR VERTICAL
LIFTS ONLY**

**ANGLE LIFTS MUST USE
BS4278 TABLE I**

TABLE 3

A	B	D	E	F	G	H	SWL	Weight Each
mm	mm	mm	mm	mm	mm	mm	tonnes	kgs
M12	17	5	22	9	27	18	0.32	0.08
M16	23	6	29	11	34	23	0.63	0.14
M20	32	9	40	15	47	32	1.25	0.40
M24	40	12	51	19	60	40	2.00	0.78
M30	51	14	64	24	76	51	3.20	1.78
M36	63	18	79	30	95	63	5.00	2.44
M42	70	20	88	33	105	70	6.30	4.10
M48	79	22	99	37	118	79	8.00	7.70
M52	89	26	112	42	134	89	10.00	10.00

TABLE 6

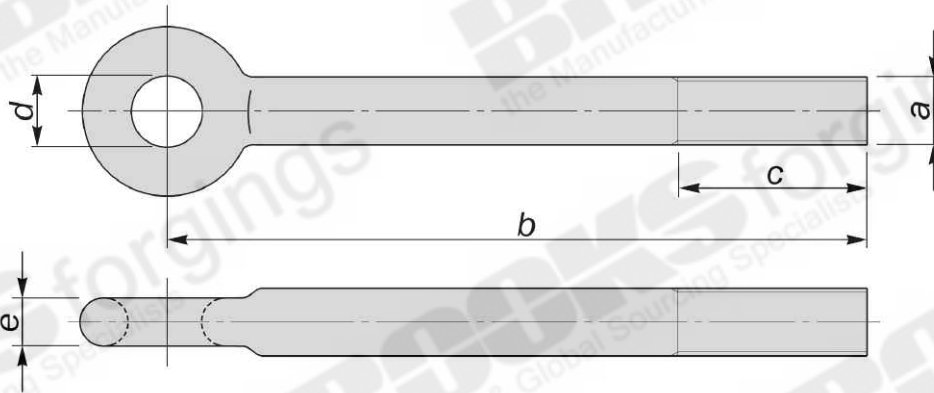
A	B	D	E	F	G	H	SWL	Weight Each
inches	mm	mm	mm	mm	mm	mm	tonnes	kgs
3/8	17	5	22	9	27	18	0.25	0.08
1/2	23	6	29	11	34	23	0.50	0.08
5/8	28	8	35	14	42	28	0.90	0.14
3/4	32	9	40	15	47	32	1.25	0.40
7/8	35	10	44	17	53	35	1.60	0.60
1.	40	12	51	19	60	40	2.00	0.78
1. 1/4	51	14	64	24	76	51	3.20	1.90
1. 1/2	63	18	79	30	95	63	5.00	2.44
1. 3/4	79	22	99	37	118	79	8.00	7.70
2	89	26	112	42	134	89	10.00	10.00

DYNAMO EYEBOLTS

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SLING ROD EYEBOLTS - INTEGRAL FORGED EYE

- TO BS 3974 : 1974 PART 1



A	B*	C*	D	E	SWL	Weight Each
mm	mm	mm	mm	mm	kgs	kgs
M8	300	200	14	6	230	0.13
M10	300	200	16	7	360	0.21
M12	300	200	18	9	530	0.32
M16	300	200	22	12	1010	0.55
M20	300	200	26	14	1580	0.89
M24	300	200	30	17	2280	1.25
M30	300	200	36	21	3650	1.93
M36	300	200	42	26	5340	2.90
M42	300	200	48	30	7400	4.05

* DENOTES STANDARD SIZES, SHORTER LENGTHS ALSO AVAILABLE. LONGER LENGTHS OF SHANK AVAILABLE UP TO 3000MM. FORGED IN ONE PIECE THEREFORE REMOVING THE NEED FOR TIE BARS AND TURNBUCKLES.

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

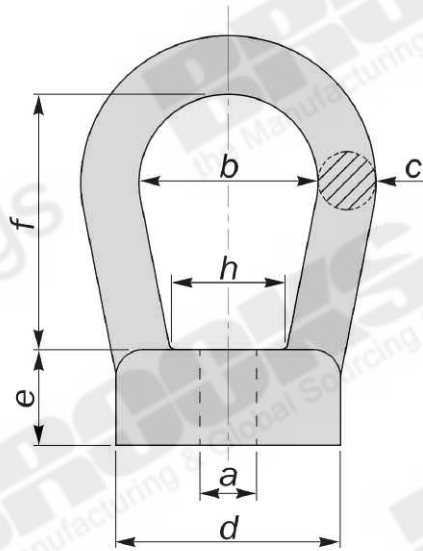
NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

SLING ROD EYEBOLTS - INTEGRAL FORGED EYE



BOW NUTS

-TO BS 3974 : 1974 PART I



A		B	C	D	E	F	H	SWL	Weight Each
mm	inches	mm	mm	mm	mm	mm	mm	kgs	kgs
M8	1/4	25	10	32	16	41	18	230	0.2
M10	3/8	25	10	32	16	41	18	360	0.2
M12	1/2	30	12	38	18	43	20	530	0.3
M16	5/8	30	12	38	18	43	20	1010	0.3
M18	3/4	40	14	45	25	63	25	1290	0.6
M20	---	40	14	45	25	63	25	1580	0.6
M22	7/8	50	17	50	28	79	30	1930	0.6
M24	1	50	17	50	28	79	30	2280	0.9
M30	1. 1/8	75	26	70	38	82	46	3650	2.4
M33	1. 1/4	75	26	70	38	82	46	4490	2.4
M36	1. 1/2	75	26	70	38	82	46	5340	2.4
M42	1. 3/4	100	30	80	45	105	59	7400	4.8

MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

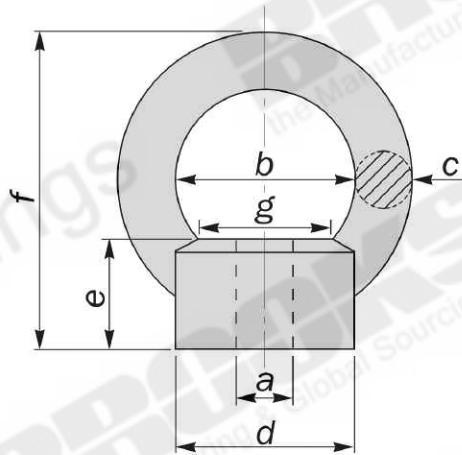
FINISH

- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**

BOW NUTS

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EYE NUTS



A		B	C	D	E	F	H	SWL	Weight Each
mm	inches	mm	mm	mm	mm	mm	mm	kgs	kgs
M6	1/4	25	9	22	14	47	16	60	0.1
M8	5/16	25	9	22	14	47	16	95	0.1
M10	3/8	25	9	22	14	47	16	160	0.1
M12	1/2	44	13	29	22	78	23	320	0.3
M16	5/8	44	13	29	22	78	23	630	0.3
M18	---	47	16	39	26	84	31	1000	0.4
M20	3/4	47	16	39	26	84	31	1250	0.4
M22	7/8	47	16	39	26	84	31	1600	0.4
M24	1	52	21	44	38	105	36	2000	0.8

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

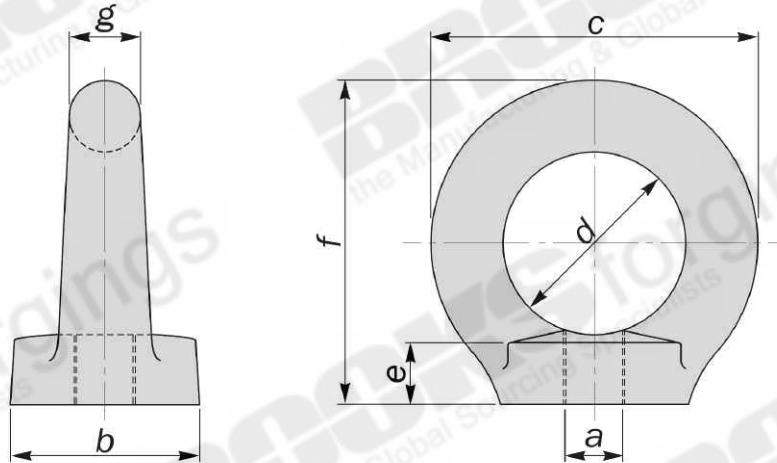
EYE NUTS

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DIN 582 EYENUTS

-TO DIN 582



A	B	C	D	E	F	G	SWL	Weight Each
mm	mm	mm	mm	mm	mm	mm	kgs	kgs
M6	20	36	20	8.5	36	8	70	0.05
M8	20	36	20	8.5	36	8	140	0.05
M10	25	45	25	10	45	10	230	0.09
M12	30	54	30	11	53	12	340	0.15
M14	35	63	35	13	62	14	490	0.24
M16	35	63	35	13	62	14	700	0.24
M20	40	72	40	16	71	16	1200	0.36
M22	45	81	45	18	81	18	1500	0.58
M24	50	90	50	20	90	20	1800	0.72
M27	50	90	50	20	90	20	2500	0.72
M30	65	108	60	25	109	24	3200	1.32
M33	65	108	60	25	109	24	4300	1.32
M36	75	126	70	30	128	28	4600	2.08
M39	75	126	70	30	128	28	6100	2.08
M42	85	144	80	35	147	32	6300	3.11
M45	85	144	80	35	147	32	8000	3.04
M48	100	166	90	40	168	38	8600	5.02
M52	100	166	90	40	168	38	9900	5.02
M56	110	184	100	45	187	42	11500	6.69
M64	120	206	110	50	208	48	16000	9.30

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

SWL SHOWN FOR VERTICAL LIFT

ITEMS SUPPLIED UNTESTED UNLESS REQUESTED

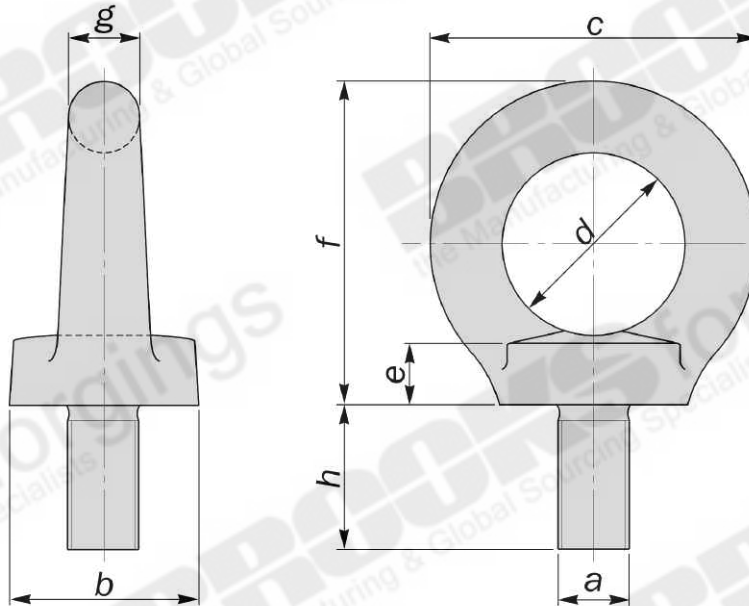
DIN 582 EYENUTS

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DIN 580 EYEBOLTS

- TO DIN 580



DIN 580 EYEBOLTS

A	B	C	D	E	F	G	H	SWL	Weight Each
mm	mm	mm	mm	mm	mm	mm	mm	kgs	kgs
M6	17	28	16	6	31	6	13	70	0.06
M8	20	36	20	6	36	8	15	140	0.08
M10	25	45	25	8	45	10	18	230	0.11
M12	30	54	30	10	53	12	22	340	0.18
M14	35	63	35	12	62	14	28	490	0.29
M16	35	63	35	12	62	14	28	700	0.29
M20	40	72	40	14	71	16	30	1200	0.45
M22	45	81	45	16	80	18	35	1500	0.67
M24	50	90	50	16	90	20	38	1800	0.87
M27	50	90	50	18	90	20	38	2500	0.88
M30	65	108	60	18	109	24	45	3200	1.66
M33	65	108	60	22	109	24	45	4300	1.72
M36	75	126	70	22	128	28	55	4600	2.65
M39	75	126	70	26	128	28	55	6100	2.80
M42	85	144	80	30	147	32	65	7000	4.03
M45	85	144	80	30	147	32	65	8000	4.25
M48	100	166	90	35	168	36	70	8600	6.38
M52	100	166	90	35	168	36	70	9900	6.66
M56	110	184	100	38	187	42	80	11500	8.80
M64	120	206	110	42	208	48	90	16000	12.40

MATERIAL
CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

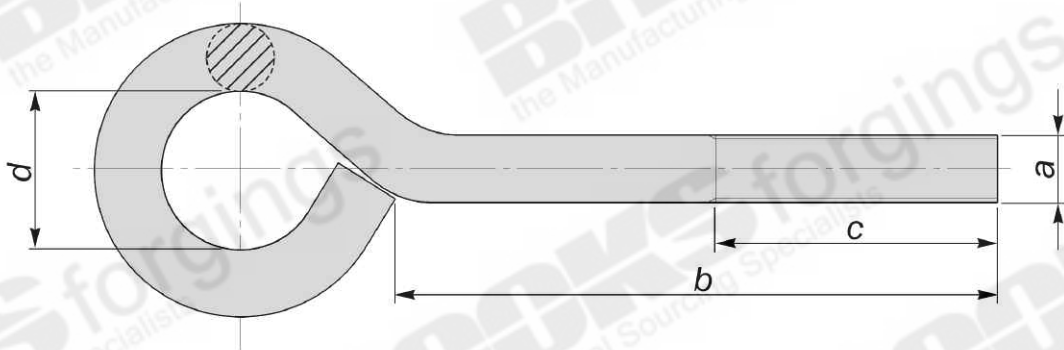
FINISH
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

SWL SHOWN FOR VERTICAL LIFT
ITEMS SUPPLIED UNTESTED UNLESS REQUESTED



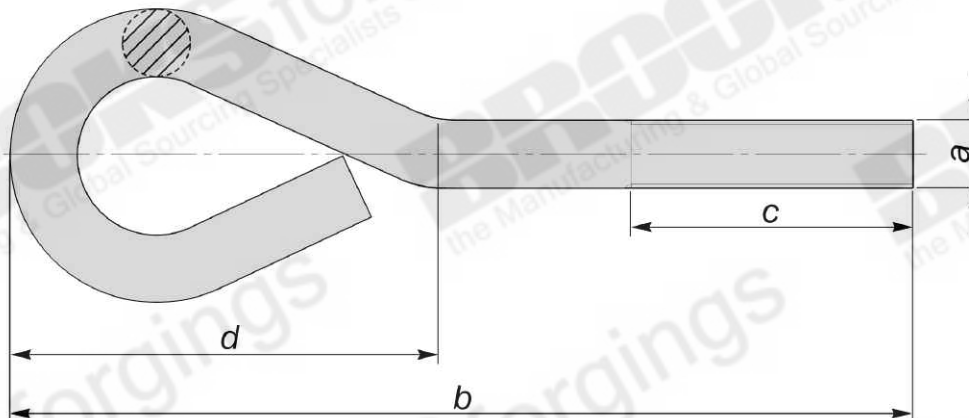
CURLED EYEBOLTS

ROUND TYPE



THREADS M6 - M100 (1/4" - 4")

PEAR TYPE



THREADS M6 - M100 (1/4" - 4")

MATERIAL

CARBON STEELS
STAINLESS STEELS
ALLOY STEELS
B7, 4.6, 5.6, 8.8

FINISH

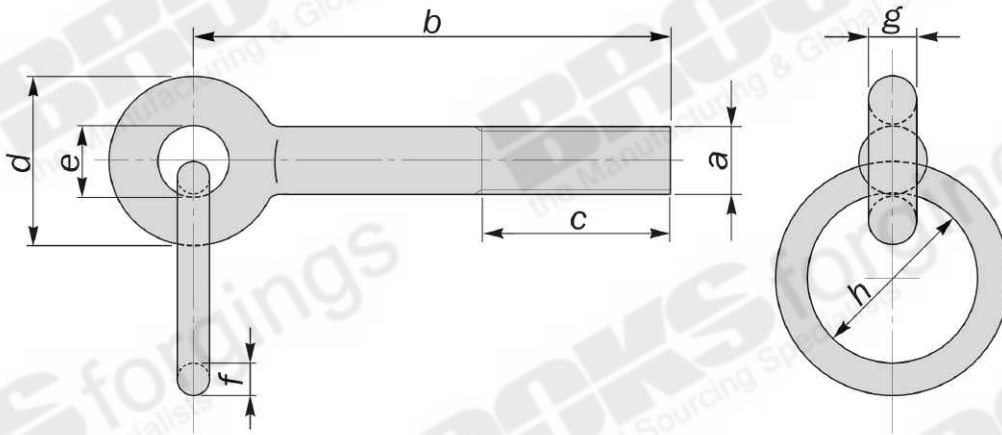
SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
PTFE COATING

ALSO AVAILABLE WELDED
SHANK LENGTH 5000 MAX
DIMENSIONS TO SUIT
CUSTOMERS

CURLED EYEBOLTS

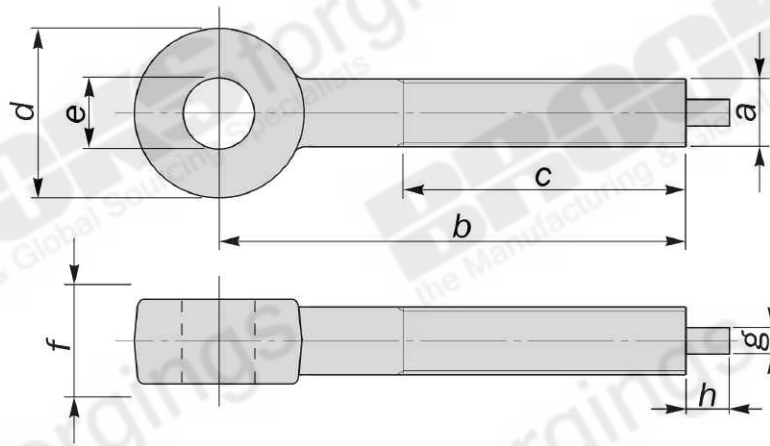
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RING EYEBOLTS



THREADS M6 - M100 (1/4" - 4")

NIB END EYEBOLTS



THREADS M6 - M100 (1/4" - 4")

MATERIAL

- CARBON STEELS**
- STAINLESS STEELS**
- ALLOY STEELS**
- B7, 4.6, 5.6, 8.8**

FINISH

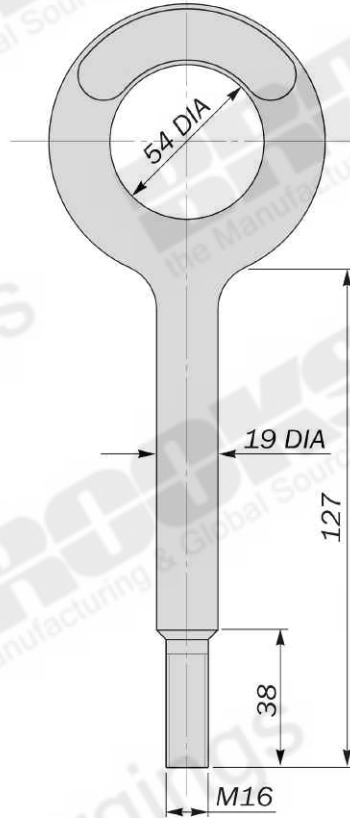
- SELF COLOUR**
- GALVANISED**
- ELECTROPLATED**
- SHERARDISED**
- PTFE COATING**

**NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS**

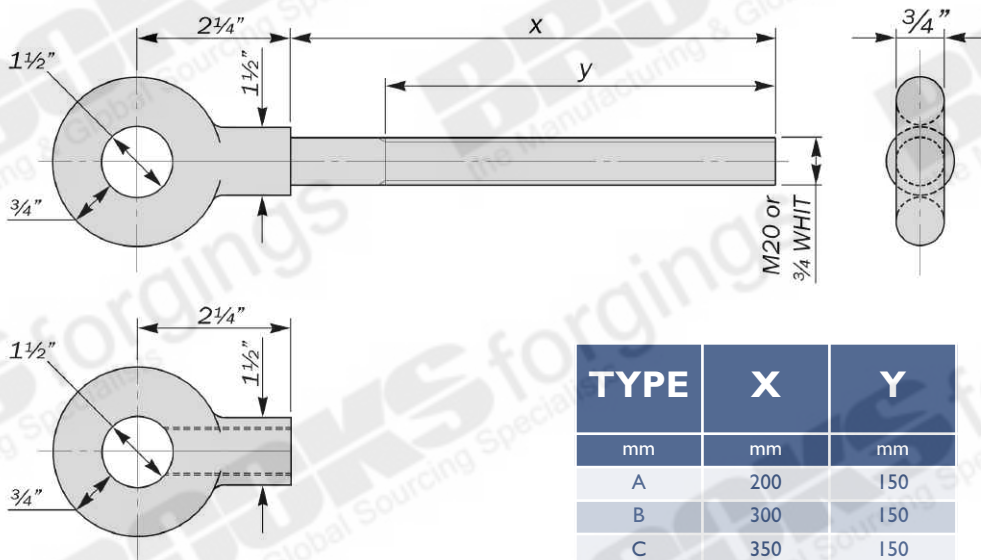
RING EYEBOLTS | NIB END EYEBOLTS



SCAFFOLD RESTRAINT EYEBOLTS



EYEBOLTS & EYENUTS TO BS 1320



TYPE	X	Y
mm	mm	mm
A	200	150
B	300	150
C	350	150

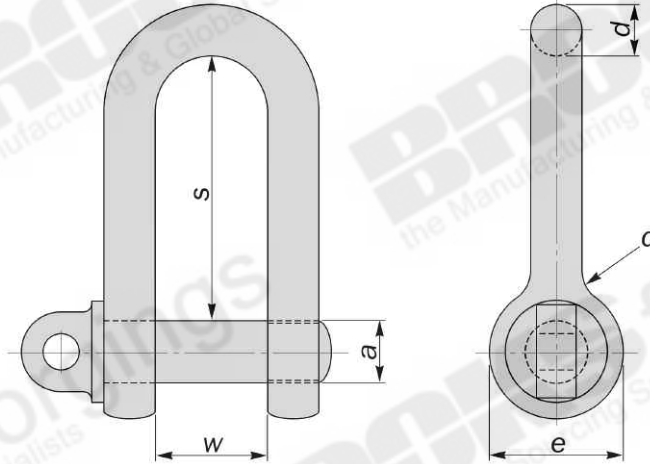
MATERIAL
CARBON STEELS
STAINLESS STEELS

FINISH
GALVANISED
ELECTRO POLISHED
PLASTIC COATING

**NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS**

D SHACKLES - SMALL

- TO BS 3032 : 1958 TABLE I



SWL		A	D	W	S	E	Weight Each
Tons	cwt	inches	inches	inches	inches	inches	kgs
---	6	1/4	3/8	3/8	7/8	3/4	0.1
---	12	3/8	1/2	5/8	1. 3/8	1	0.1
1	0	1/2	5/8	7/8	1. 7/8	1. 1/4	0.3
1	15	5/8	3/4	1	2. 1/4	1. 1/2	0.6
2	10	3/4	7/8	1. 1/4	2. 3/4	1. 3/4	1.0
3	10	7/8	1	1. 3/8	3. 1/4	2	1.5
4	10	1	1. 1/8	1. 1/2	3. 5/8	2. 1/4	2.3
5	10	1. 1/8	1. 1/4	1. 3/4	4. 1/8	2. 1/2	3.3
7	0	1. 1/4	1. 3/8	1. 7/8	4. 1/2	2. 3/4	4.5
8	0	1. 3/8	1. 1/2	2. 1/8	5	3. 1/4	6.0
10	15	1. 1/2	1. 3/4	2. 3/8	5. 1/2	3. 1/2	8.6
13	0	1. 5/8	1. 7/8	2. 1/2	5. 7/8	3. 3/4	9.5
14	15	1. 3/4	2	2. 3/4	6. 3/8	4	12.5
16	15	1. 7/8	2. 1/8	2. 7/8	6. 3/4	4. 1/4	15.3
19	0	2	2. 1/4	3	7. 1/4	4. 1/2	18.4
20	0	2. 1/8	2. 3/8	3. 1/4	7. 3/4	4. 3/4	22.3
25	0	2. 3/8	2. 3/4	3. 5/8	8. 5/8	5. 1/2	30.9
30	0	2. 1/2	2. 7/8	3. 7/8	9	5. 3/4	35.9
35	0	2. 3/4	3. 1/8	4. 1/4	10	6. 1/4	48.1
40	0	2. 7/8	3. 1/4	4. 3/8	10. 3/8	6. 1/2	54.9
50	0	3. 1/4	3. 3/4	5	10. 3/4	7. 1/2	79.0
65	0	3. 5/8	4. 1/4	5. 1/2	13. 1/8	8. 1/2	109.9
80	0	4	4. 5/8	6. 1/8	14. 1/2	9. 1/4	147.6

MATERIAL

BS 970 150M19 (EN14A)
STAINLESS STEELS
B7

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
CHEMICAL BLACK

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

D SHACKLES - SMALL

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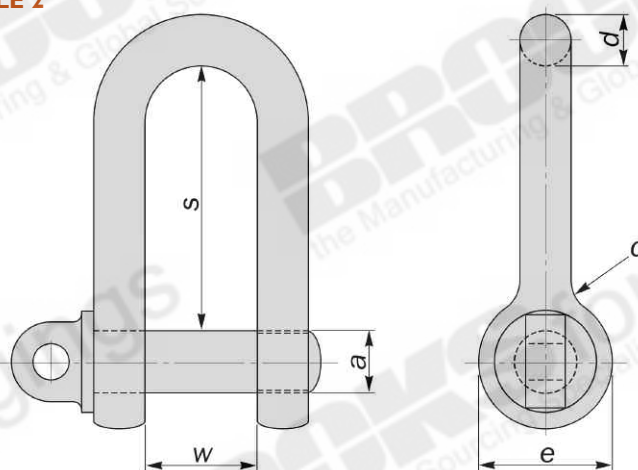


national highway sector schemes

Approved

D SHACKLES - LARGE

-TO BS 3032 : 1958 TABLE 2



SWL		A	D	W	S	E	Weight Each
Tons	cwt	inches	inches	inches	inches	inches	kgs
---	5	1/4	3/8	1/2	1	3/4	0.1
---	10	3/8	1/2	3/4	1. 1/2	1	0.1
---	15	1/2	5/8	1. 1/8	2. 1/8	1. 1/4	0.3
1	10	5/8	3/4	1. 1/4	2. 1/2	1. 1/2	0.6
2	0	3/4	7/8	1. 1/2	2. 7/8	1. 3/4	0.9
3	0	7/8	1	1. 3/4	3. 1/4	2	1.6
3	15	1	1. 1/8	2	3. 3/4	2. 1/4	2.3
5	0	1. 1/8	1. 1/4	2. 1/8	4. 1/8	2. 1/2	3.3
6	0	1. 1/4	1. 3/8	2. 3/8	4. 1/2	2. 3/4	4.5
7	0	1. 3/8	1. 1/2	2. 5/8	5	3	6.1
9	10	1. 1/2	1. 3/4	2. 3/4	5. 3/8	3. 1/4	8.7
11	5	1. 5/8	1. 7/8	3	5. 3/4	3. 1/2	10.0
13	0	1. 3/4	2	3. 1/4	6. 1/8	3. 3/4	12.5
14	5	1. 7/8	2. 1/8	3. 5/8	7	4. 1/4	15.3
16	5	2	2. 1/4	3. 7/8	7. 3/8	4. 1/2	18.5
18	0	2. 1/8	2. 3/8	4. 1/8	7. 3/4	4. 3/4	20.0
20	0	2. 1/4	2. 1/2	4. 1/4	8. 1/4	5	22.2
25	0	2. 1/2	2. 7/8	4. 3/4	9. 1/4	5. 3/4	35.8
30	0	2. 3/4	3. 1/8	5. 1/4	10. 1/4	6. 1/4	39.0
35	0	3	3. 3/8	5. 3/4	11	6. 3/4	62.7
40	0	3. 1/8	3. 1/2	5. 7/8	11. 1/2	7	70.8
50	0	3. 1/2	4	6. 3/4	13	8	99.4
65	0	4	4. 1/2	7. 1/2	14. 3/4	9	148.5
80	0	4. 1/2	5	8. 5/8	16. 1/2	10	211.6

MATERIAL

BS 970 150M19 (EN14A)
STAINLESS STEELS
B7

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
CHEMICAL BLACK

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

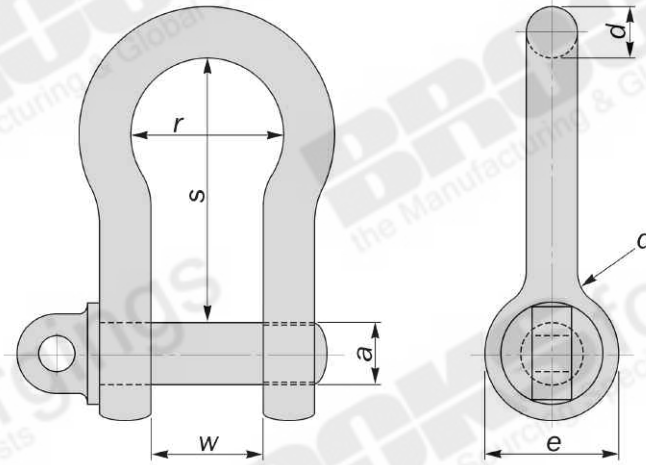
D SHACKLES - LARGE

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BOW SHACKLES - LARGE

- TO BS 3032 : 1958 TABLE 3



SWL		A	D	W	R	S	E	Weight Each
Tons	cwt	inches	inches	inches	inches	inches	inches	kgs
---	3	1/4	3/8	1/2	3/4	1. 1/8	3/4	0.1
---	9	3/8	1/2	5/8	1	1. 5/8	1	0.1
---	15	1/2	5/8	7/8	1. 1/4	2. 1/8	1. 1/4	0.3
1	5	5/8	3/4	1. 1/8	1. 5/8	2. 3/4	1. 1/2	0.6
2	0	3/4	7/8	1. 3/8	2	3. 3/8	1. 3/4	1.0
2	15	7/8	1	1. 5/8	2. 1/4	3. 7/8	2	1.6
3	15	1	1. 1/8	1. 3/4	2. 1/2	4. 1/4	2. 1/4	2.4
4	15	1. 1/8	1. 1/4	2	2. 7/8	4. 7/8	2. 1/2	3.4
5	15	1. 1/4	1. 3/8	2. 1/4	3. 1/4	5. 3/8	2. 3/4	4.8
7	5	1. 3/8	1. 1/2	2. 1/2	3. 1/2	6	3	6.2
8	10	1. 1/2	1. 3/4	2. 3/4	3. 7/8	6. 5/8	3. 1/2	9.1
9	10	1. 5/8	1. 7/8	3	4. 3/8	7. 3/8	3. 3/4	10.4
11	10	1. 3/4	2	3. 3/8	4. 3/4	8. 1/8	4	13.1
13	0	1. 7/8	2. 1/8	3. 5/8	5. 1/8	8. 3/4	4. 1/4	15.9
15	0	2	2. 1/4	3. 7/8	5. 1/2	9. 3/8	4. 1/2	19.5
18	10	2. 1/4	2. 1/2	4. 1/8	6	10. 1/8	5	27.7
20	0	2. 3/8	2. 5/8	4. 3/8	6. 3/8	10. 3/4	5. 1/4	32.7
25	0	2. 5/8	2. 7/8	4. 3/4	7	11. 7/8	5. 3/4	44.0
30	0	2. 7/8	3. 1/8	5. 1/4	7. 3/4	13	6. 1/4	57.7
35	0	3. 1/8	3. 3/8	5. 3/4	8. 3/8	14. 1/8	6. 3/4	74.0
40	0	3. 3/8	3. 5/8	6. 1/4	9	15. 1/4	7. 1/4	93.1
50	0	3. 3/4	4	6. 3/4	10	16. 7/8	8	128.0
65	0	4. 1/4	4. 5/8	7. 3/4	11. 1/4	19	9. 1/4	186.1
80	0	4. 5/8	5	8. 1/2	12. 1/8	21	10	239.7

MATERIAL

BS 970 150M19 (EN14A)
STAINLESS STEELS
B7

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
CHEMICAL BLACK

NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

D SHACKLES - SMALL

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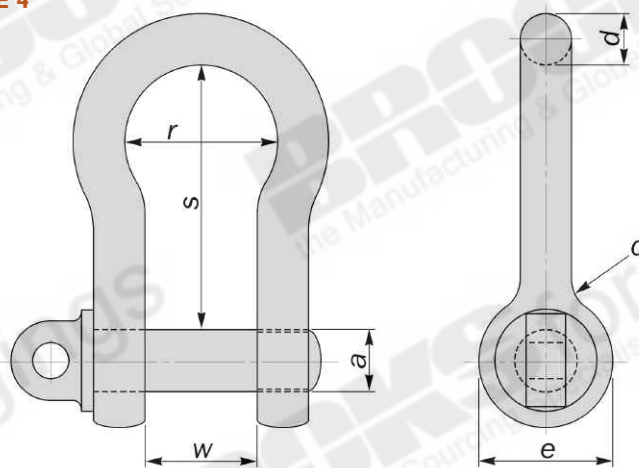


national highway sector schemes

Approved

BOW SHACKLES - SMALL

-TO BS 3032 : 1958 TABLE 4



SWL		A	D	W	R	S	E	Weight Each
Tons	cwt	inches	inches	inches	inches	inches	inches	kgs
---	4	1/4	3/8	1/2	5/8	1	3/4	0.1
---	10	3/8	1/2	5/8	7/8	1. 1/2	1	0.1
1	0	1/2	5/8	7/8	1. 1/8	2	1. 1/4	0.3
1	10	5/8	3/4	1. 1/8	1. 1/2	2. 1/2	1. 1/2	0.7
2	0	3/4	7/8	1. 3/8	1. 3/4	3	1. 3/4	1.0
3	0	7/8	1	1. 1/2	2	3. 1/2	2	1.6
4	0	1	1. 1/8	1. 3/4	2. 3/8	4	2. 1/4	2.4
5	0	1. 1/8	1. 1/4	2	2. 5/8	4. 1/2	2. 1/2	3.3
6	5	1. 1/4	1. 3/8	2. 1/4	3	5	2. 3/4	4.6
7	10	1. 3/8	1. 1/2	2. 3/8	3. 1/4	5. 1/2	3	6.3
9	5	1. 1/2	1. 3/4	2. 5/8	3. 1/2	6	3. 1/2	8.8
10	10	1. 5/8	1. 7/8	2. 7/8	3. 7/8	6. 1/2	3. 3/4	10.1
12	10	1. 3/4	2	3. 1/8	4. 1/8	7	4	13.0
14	5	1. 7/8	2. 1/8	3. 3/8	4. 1/2	7. 1/2	4. 1/4	15.4
16	10	2	2. 1/4	3. 5/8	4. 3/4	8	4. 1/2	18.8
18	10	2. 1/8	2. 3/8	3. 3/4	5	8. 1/2	4. 3/4	22.7
20	0	2. 1/4	2. 1/2	4. 1/8	5. 3/8	9	5	26.8
25	0	2. 1/2	2. 3/4	4. 1/2	6	10	5. 1/2	36.7
30	0	2. 3/4	3. 1/8	5	6. 5/8	11	6. 1/4	49.0
35	0	3	3. 3/8	5. 3/8	7. 1/4	12	6. 3/4	63.6
40	0	3. 1/8	3. 1/2	5. 5/8	7. 1/2	12. 1/2	7	71.7
50	0	3. 1/2	3. 7/8	6. 1/4	8. 3/8	14	8	101.2
65	0	4	4. 1/2	7. 1/4	9. 5/8	16	9	150.7
80	0	4. 1/2	5	8. 1/8	10. 3/4	18	10	214.7

MATERIAL

BS 970 150M19 (EN14A)
STAINLESS STEELS
B7

FINISH

SELF COLOUR
GALVANISED
ELECTROPLATED
SHERARDISED
CHEMICAL BLACK

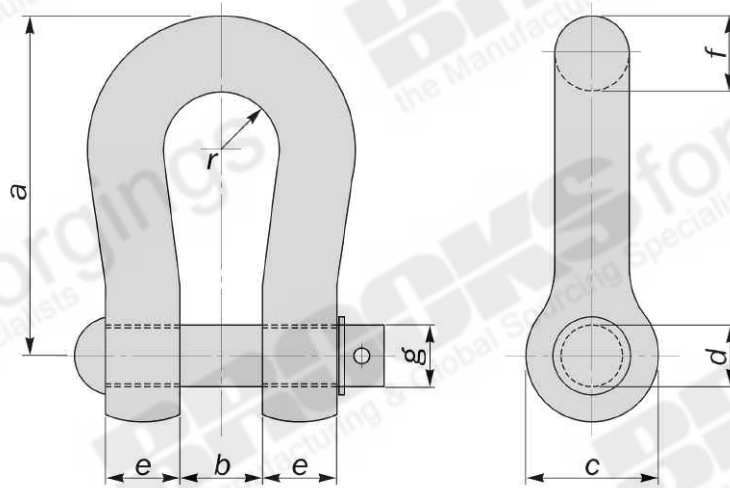
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AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS

D SHACKLES - LARGE

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SHACKLES FOR OVERHEAD POWER LINES

- TO BS 3288 : 1990 PART 2



REF NUMBER	MIN FAILING LOAD	A	B	C	D	E	F	R	G DIA	PIN LENGTH	BOLT LENGTH
	kn	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
15/29	70	86	19	35	18	9.5	16	16	M16	60	70
28/29	125	95	21	54	22	13	19	19	M20	65	85
42/29	190	105	27	51	24	22	22	17	M22	95	115
42/103	190	105	28	51	27	22	22	17	SAG ADJUSTER PIN		
67/103	300	115	27	60	29	25	25	20	M27	105	120
15/129	70	109	22	44	18	19	19	19	M16	90	90
42/129	190	124	28	57	32	22	22	17	M30	100	120
28/108	125	104	38	45	24	20	20	19	M22	105	125

AVAILABLE WITH PIN OR HEXAGON BOLT

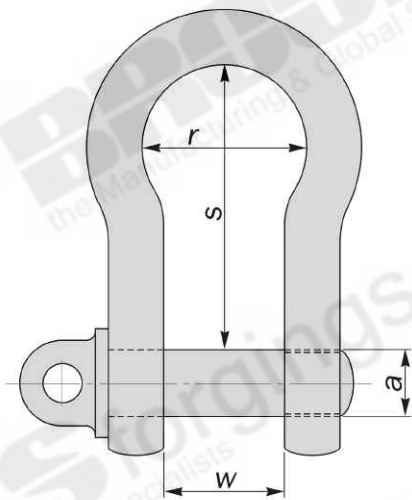
MATERIAL
CARBON STEELS

FINISH
GALVANISED

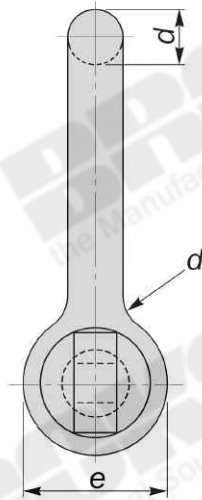
NON STANDARDS
AVAILABLE TO SUIT
CUSTOMERS REQUIREMENTS



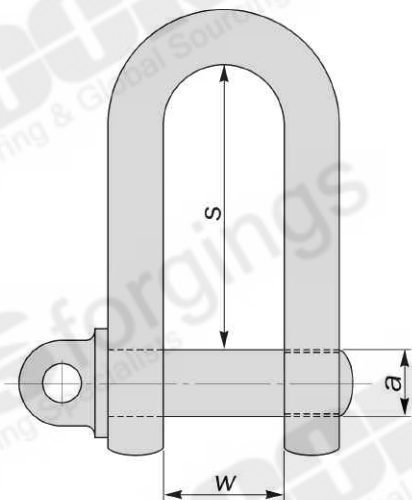
SPECIAL SHACKLES



BOW TYPE
TO BS 3032 : 1958



TO BS 6994 : 1988



DEE TYPE
TO BS 3288 : 1990

TO U.S. FEDERAL SPECIFICATION RR-C-271B

ANCHOR SHACKLES

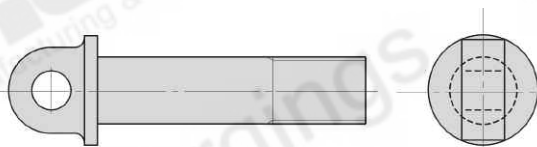
GRAB SHACKLES

MOORING SHACKLES

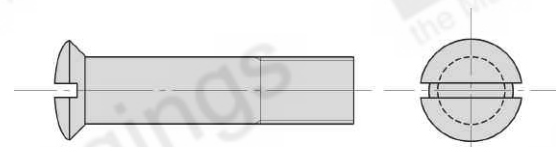
CHAIN SHACKLES

KENTER SHACKLES

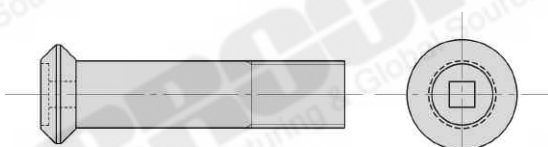
ALTERNATIVE SHACKLE PINS



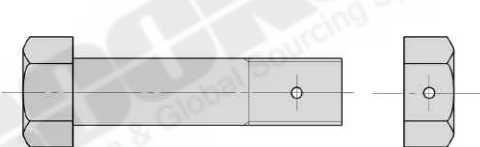
TYPE A



TYPE C

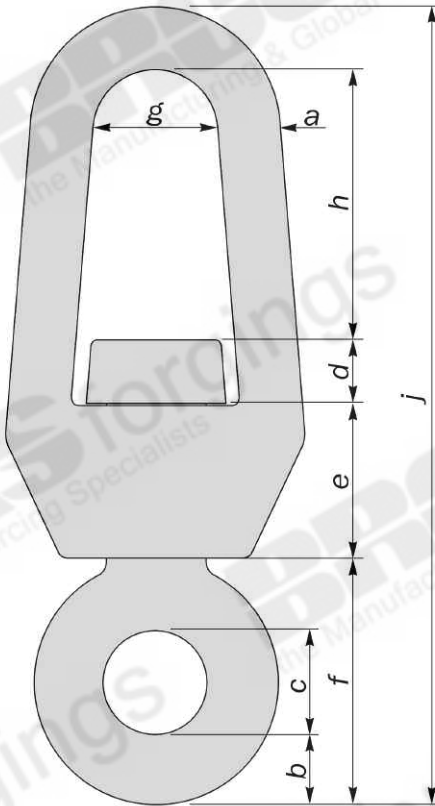


TYPE D



TYPE E

SWIVELS



PLAIN BEARING AND BALL BEARING SWIVELS

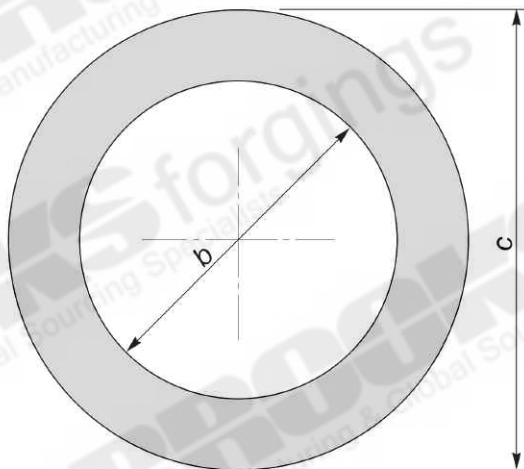
FOR USE WITH CHAIN AND WIRE ROPE

SWL FROM 50 KG TO 30,000 KG

AVAILABLE TO SUIT CUSTOMERS REQUIREMENTS

SWIVELS | ROLLED RINGS

RINGS - ROLLED & FLASH BUTT WELDED



**MATERIAL DIAMETERS
6MM TO 100MM**

**INTERNAL DIAMETERS
38MM TO 500MM**

**HOT ROLLED &
FLASH BUTT WELDED**

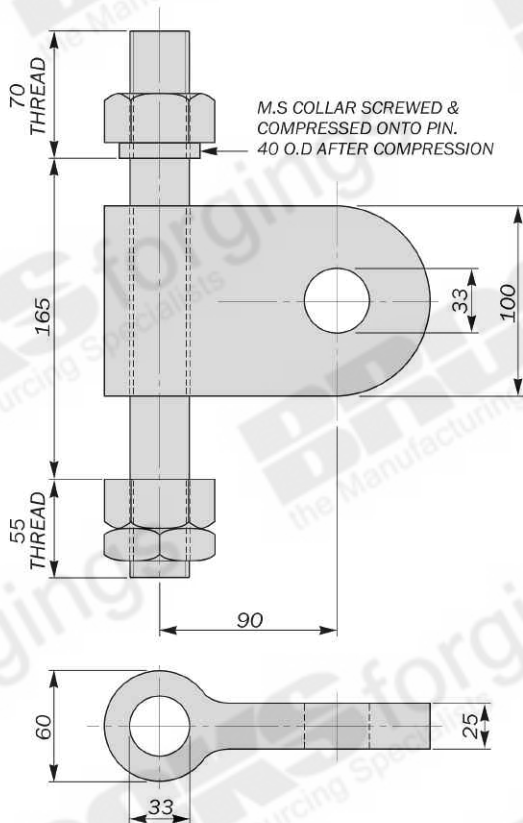
AVAILABLE TO SUIT CUSTOMERS REQUIREMENTS



OVERHEAD POWER LINE FITTINGS

-TO BS 3288 : 1990 PART 2

SUSPENSION SWIVELS



**SUSPENSION SWIVELS FOR
CONDUCTOR CROSSARM AND
EARTHWIRE PEAKS 400 KN LOAD**

**ALSO AVAILABLE WITH HEXAGON
BOLTS AND PLAIN PIN**

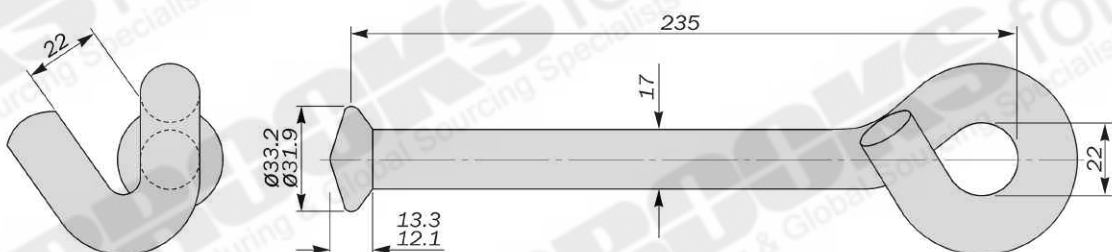
**SMALLER SWIVEL (125 KN) ALSO
AVAILABLE**

GALVANISED FINISH

**CAN BE SUPPLIED WITH HOLE
DIAMETERS TO SUIT CUSTOMER**

-TO BS 3288 : 1990 PART 2

BALL ENDED HOOKS

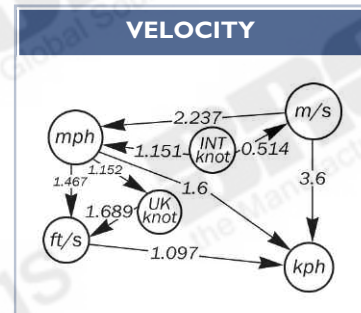
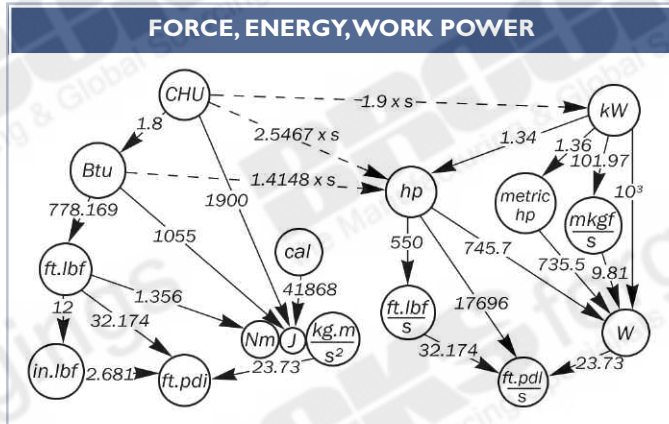
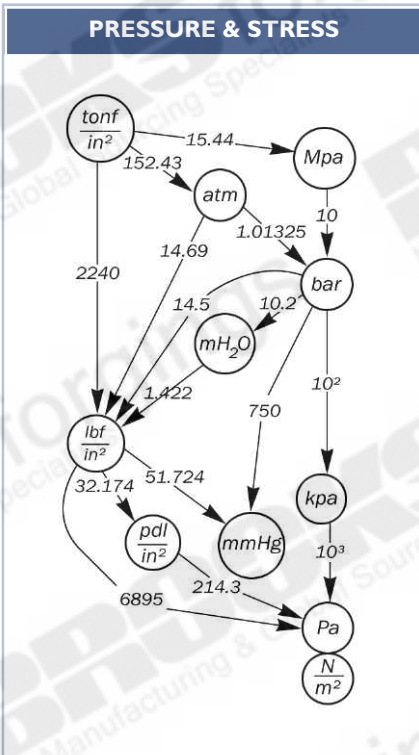
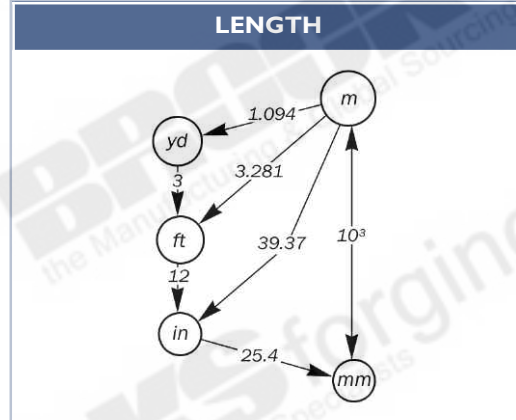
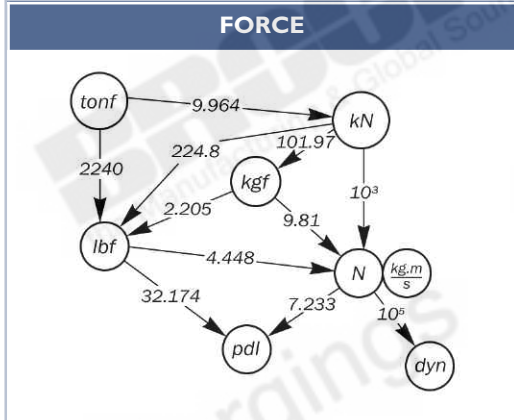


OVERHEAD POWER LINE FITTINGS

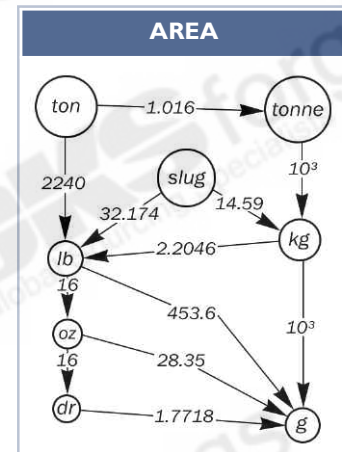
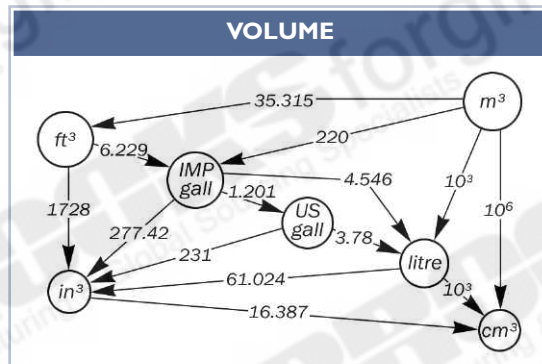
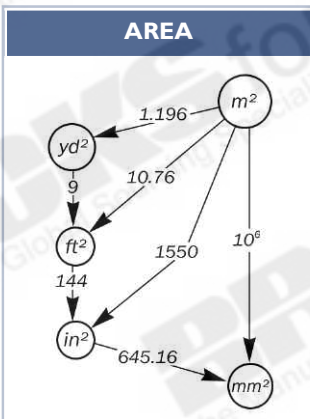
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CONVERSION FACTORS



HOW TO USE:
 MULTIPLY BY FACTOR IN
 DIRECTION OF ARROW. DIVIDE
 BY FACTOR OPPOSING
 DIRECTION OF ARROW



CONVERSION FACTORS

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national highway sector schemes

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LIFTING GEAR REGULATIONS

	ITEM OF GEAR	DOCK REGULATIONS 1934	FACTORIES ACT 1961	CONSTRUCTION (LIFTING OPERATIONS) REGULATIONS 1961
HEAT TREATMENT	All wrought iron, chains, rings, hooks, shackles and swivels (unless exempted)	1/2" and under - every 6 months.	1/2" and under - every 6 months.	1/2" and under - every 6 months.
		Over 1/2" - every 12 months.	Over 1/2" - every 14 months.	Over 1/2" - every 14 months
		When used on hand operated machinery, periods may be doubled.	If used for molten metal, every 6 months.	Applicable to plate clamps and eye bolts if wrought iron.
TESTING	Blocks, chains, rings, hooks, shackles and swivels.	Before taking into use and after repair.	Before taking into use and after repair.	Before taking into use and after repair. In case of pulley blocks, applies only when raising or lowering loads of 1 ton or more. Also applies to plate clamps and eye bolts.
	Wire ropes.	Breaking-load test on sample of rope recorded on Form 87.	Breaking-load test on sample of rope recorded on Form 87.	Breaking-load test on sample of rope recorded on Form 87. Slings to be tested before taking into use and certificates issued.
EXAMINING	Blocks	After proof loading and every 12 months. Also before use or in preceding 3 months.	After proof loading and every 14 months.	After proof loading and every 14 months. Inspect in position every week.
	All chains, rings, hooks, shackles and swivels.	After proof loading and every 12 months. Also before use or in preceding 3 months.	After proof loading and every 6 months.	After proof loading and every 6 months. When not in regular use, examine only when necessary. Also applies to plate clamps and eye bolts.
	Wire ropes	Inspect every 3 months. After broken wires appear, inspect every month.	Every 6 months.	On cranes, inspect in position every week. Slings, after proof loading and every 6 months. When not in use, examine only when necessary.
	Fibre rope slings	---	Every 6 months.	Every 6 months.
Form No. 86	Test Certificate. For pulley blocks.			
Form No. 87	Function. Wire rope. Covers all wire rope and wire rope slings except those spliced mechanically for which a Form 97, with the proof test, should be obtained in addition.			
Form No. 97	Test Certificate. For (a) all new equipment before being taken into use, and (b) equipment that has had to be retested after repairs (except pulley blocks).			
Form No. 1946	Heat treatment. For (a) the annealing of wrought iron equipment, and (b) the heat treatment of steel gear with which the temperature is noted.			
Form No. 1952	Examination. Covers lifting equipment that has been thoroughly examined but not retested. The re-tested is required after repair.			



MECHANICAL PROPERTIES OF STEEL BOLTS & SCREWS

MECHANICAL PROPERTY			STRENGTH GRADE DESIGNATION									
			4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9
Tensile strength Rm	min	kgf/mm ²	40	50	60	80	100	120	140			
		N/mm ²	392	490	588	785	981	1177	1373			
	max (see note 1)	max. kgf/mm ²	55	70	80	100	120	140	160			
		N/mm ²	539	686	785	981	1177	1373	1569			
Brinell Hardness	min	HB	110	140	170	225	280	330	390			
	max (see note 1)	HB	170	215	245	300	365	425	---			
Rockwell Hardness	min	HRB	62	77	88	---	---	---	---			
		HRC	---	---	---	18	27	34	40			
	max (see note 1)	HRB	88	97	102	---	---	---	---			
		HRC	---	---	---	31	38	44	49			
Vickers Hardness HV30	min		110	140	170	225	280	330	400			
	max (see note 1)		170	215	245	300	370	440	510			
Yield Stress R ₀	min	kgf/mm ²	24	32	30	40	36	48	---	---	---	
		N/mm ²	235	314	294	392	353	471	---	---	---	
Stress at permanent set limit R	max	kgf/mm ²	---	---	---	---	---	---	64	90	108	
		N/mm ²	---	---	---	---	---	---	628	883	1059	
Stress under load S (see note 2)		Sp/R ₀	0.94	0.91	0.94	0.91	0.94	0.91	0.91	0.88	0.88	
		kgf/mm ²	22.6	29.1	28.2	36.4	33.9	43.7	58.2	79.2	95.0	
		N/mm ²	222	286	276	357	333	429	571	777	932	
Elongation A after fracture		Min percent	25	14	20	10	16	8	12	9	8	
Strength under wedge loading			The values for full size bolts equals the minimum values for tensile strength shown above (see note 3)									
Charpy Impact Strength	min	kgfm/cm ²							6	4	3	
		Ft lbf							22	14	11	
Head Soundness			No fracture (see note 4)									
Decarburization at roof of thread			Depth not more than 1/10 of H									
Non-decarburized zone			Depth not less than 2/3 of H									

NOTE 1: Only for full size bolts.

NOTE 2: The allowed permanent extension is 12.5 micrometres.

NOTE 3: The fracture should not take place immediately under the head of the bolt.

NOTE 4: Where screws are threaded up to the head this property will be regarded as established even if a crack should appear in the first thread provided that the head does not snap off.

Steel bolts and screws shall meet the requirement for mechanical properties given in the table above.

The choice of testing programme A or B as shown in table over is at the option of the supplier unless specially agreed between the purchaser and the supplier. The mechanical properties of bolts to be decisive for acceptance are shown in the table above.

They have been arranged in five groups marked I to V according to the manner in which they are related to one another.

If in doubt please contact Brooks Forgings Ltd.



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ACCEPTANCE TESTS FOR STEEL BOLTS & SCREWS

TEST PROGRAMME A													
For machined test pieces and bolts with a shank area less than the stress area for strength grades													
Test Group	Mechanical Property	Ref.	Test Method	4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9
I	Tensile Strength Rm	D.2	Tensile Test	●	●	●	●	●	●	●	●	●	●
	Tensile Strength Rm	D.2	Tensile Test										
	Brinell Hardness HB	D.3	Brinell Hardness Test	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
	Rockwell Hardness HR	D.4	Rockwell Hardness Test	○	○	○	○	○	○	○	○	○	○
	Vickers Hardness HV	D.5	Vickers Hardness Test	○	○	○	○	○	○	○	○	○	○
II	Yield Point Stress Re	D.2	Tensile Test	●	●	●	●	●	●				
	Stress at permanent set limit R 0.2	D.2	Tensile Test							●	●	●	●
	Stress under proof load	D.6	Proof Load Test										
III	Percentage elongation after fracture A	D.2	Tensile Test	●	●	●	●	●	●	●	●	●	●
	Strength Under Wedge	D.7	Wedge Loading Test										
IV	Impact Strength	D.8	Impact Test							●	●	●	●
	Head Soundness	D.9	Head Soundness Test	●	●	●	●	●	●	⊖	⊖	⊖	⊖
V	Decarburization	D.10	Decarburization Test							●	●	●	●

TEST PROGRAMME B													
For full size bolts for strength grades													
Test Group	Mechanical Property	Ref.	Test Method	4.6	4.8	5.6	5.8	6.6	6.8	8.8	10.9	12.9	14.9
I	Tensile Strength Rm	D.2	Tensile Test										
	Tensile Strength Rm	D.2	Tensile Test	●	●	●	●	●	●	●	●	●	●
	Brinell Hardness HB	D.3	Brinell Hardness Test	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖	⊖
	Rockwell Hardness HR	D.4	Rockwell Hardness Test	○	○	○	○	○	○	○	○	○	○
	Vickers Hardness HV	D.5	Vickers Hardness Test	○	○	○	○	○	○	○	○	○	○
II	Yield Point Stress Re	D.2	Tensile Test										
	Stress at permanent set limit R 0.2	D.2	Tensile Test										
	Stress under proof load	D.6	Proof Load Test	●	●	●	●	●	●	●	●	●	●
III	Percentage elongation after fracture A	D.2	Tensile Test										
	Strength Under Wedge	D.7	Wedge Loading Test	●	●	●	●	●	●	●	●	●	●
IV	Impact Strength	D.8	Impact Test										
	Head Soundness	D.9	Head Soundness Test	○	○	○	○	○	○	○	○	○	○
V	Decarburization	D.10	Decarburization Test							●	●	●	●

In each group the test marked '●' is decisive for acceptance (see table). If the purchaser wishes to simplify the acceptance test, the above mentioned tests may be replaced by those marked '⊖'. In cases of doubt, however, the first mentioned test are decisive unless it is not possible to carry them out for dimensional reasons (e.g if the bolts are too short or too big). In these cases the test marked '⊖' will be decisive.

Subject to special agreement tests marked '○' may be included in addition, or they may replace the tests marked '●'.

The tests shall be carried out in accordance with the requirements of the relevant British Standard.



THREAD COMPARISONS

METRIC COARSE THREAD TO BS3643				IMPERIAL THREADS THREADS PER INCH			
PITCH	MM	INCHES	BSW	UNC	BSF	UNF	
1.00	M6						
	6.4	1/4	20	20	26	28	
1.25	M8	7.9	5/16	18	18	22	
		9.5	3/8	16	16	20	
1.50	M10						
		11.1	7/16	14	14	18	
1.75	M12						
		12.7	1/2	12	13	16	
2.00	M14						
		14.2	9/16	12	12	16	
2.00	M16	15.8	5/8	11	11	14	
		19.0	3/4	10	10	12	
2.50	M20						
2.50	M22						
3.00	M24	22.2	7/8	9	9	11	
		25.4	1	8	8	10	
3.00	M27						
		28.5	1. 1/8	7	7	9	
3.50	M30						
		31.7	1. 1/4	7	7	9	
4.00	M36	34.9	1. 3/8	6	6	8	
		38.1	1. 1/2	6	6	8	
4.00	M39						
		41.2	1. 5/8	5	---	8	
4.50	M42						
		44.4	1. 3/4	5	5	7	
4.50	M45						
5.00	M48						
5.00	M52	50.8	2	4. 1/2	4. 1/2	7	
		53.9	2. 1/8	4. 1/2	---	---	
5.50	M56						
		57.1	2. 1/4	4	4. 1/2	6	
6.00	M64	60.3	2. 3/8	4	---	---	
		63.5	2. 1/2	4	4	6	
6.00	M72						
		69.8	2. 3/4	3. 1/2	4	6	
6.00	M80	76.2	3	3. 1/2	4	5	
		82.5	3. 1/4	3. 1/4	4	5	
6.00	M90	88.9	3. 1/2	3. 1/4	4	4. 1/2	
		95.2	3. 3/4	3	4	4. 1/2	
6.00	M100						
		101.6	4	3	4	4. 1/2	

VALUES AND EQUIVALENT ARE APPROXIMATE

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THREAD COMPARISONS



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WEIGHT CHARTS FOR STEEL BAR

ROUND BAR



DIA OF BAR MM	KGS PER METER
6	0.22
8	0.40
9	0.50
10	0.62
11	0.75
12	0.89
13	1.04
14	1.21
15	1.39
16	1.58
18	2.00
19	2.23
20	2.47
22	2.98
24	3.55
25	3.85
27	4.49
28	4.83
30	5.55
32	6.31
33	6.71
35	7.55
36	7.99
38	8.90
40	9.86
42	10.87
45	12.48
48	14.20
50	15.41
52	16.67
55	18.65
56	19.33
58	20.74
60	22.19
62	23.70
64	25.25
65	26.05
68	28.51
70	30.21
72	31.96
75	34.68
80	39.45
85	44.54
90	49.93
95	55.64
100	61.65

SQUARE BAR



SIZE MM	KGS PER METER
13	1.33
14	1.54
15	1.77
16	2.01
18	2.54
19	2.83
20	3.14
22	3.80
25	4.91
28	6.15
30	7.06
32	8.04
35	9.62
38	11.33
40	12.56
45	15.89
50	19.62
57	25.50
65	33.16
70	38.46
75	44.15
83	54.07
90	63.58
95	70.84
102	81.66
110	94.97
115	103.80
130	132.65
140	153.84
150	176.60
160	200.93
165	213.69
170	226.84
180	254.31
190	283.35
200	313.96
220	379.89
230	415.21
240	452.10
255	510.38

FLAT BAR



SIZE MM	KGS PER METER	SIZE MM	KGS PER METER
20 X 5	0.79	80 X 5	3.14
20 X 10	1.57	80 X 10	6.28
20 X 15	2.36	80 X 15	9.42
25 X 5	0.98	80 X 20	12.60
25 X 10	1.96	80 X 25	15.70
25 X 15	2.94	90 X 5	3.53
30 X 5	1.12	90 X 10	7.07
30 X 10	2.36	90 X 15	10.60
30 X 15	3.53	90 X 20	14.10
35 X 5	1.37	90 X 25	17.70
35 X 10	2.75	100 X 5	3.93
35 X 15	4.12	100 X 10	7.85
40 X 5	1.57	100 X 15	11.80
40 X 10	3.14	100 X 20	15.70
40 X 15	4.71	100 X 25	19.60
40 X 20	6.28	100 X 40	31.40
40 X 25	7.85	120 X 10	9.42
45 X 5	1.77	120 X 15	14.10
45 X 10	3.53	120 X 20	18.80
45 X 15	5.30	120 X 25	23.60
45 X 20	7.07	120 X 40	37.70
45 X 25	8.83	130 X 10	10.20
50 X 5	1.96	130 X 15	15.30
50 X 10	3.93	130 X 20	20.40
50 X 15	5.89	130 X 25	25.50
50 X 20	7.85	130 X 40	40.80
50 X 25	9.81	140 X 10	11.00
60 X 5	2.36	140 X 15	16.50
60 X 10	4.71	140 X 20	22.00
60 X 15	7.07	140 X 25	27.50
60 X 20	9.42	140 X 40	44.00
60 X 25	11.80	150 X 10	11.80
65 X 5	2.55	150 X 15	17.70
65 X 10	5.10	150 X 20	23.60
65 X 15	7.65	150 X 25	29.40
65 X 20	10.20	150 X 40	47.10
65 X 25	12.80	160 X 10	12.60
70 X 5	2.75	160 X 15	18.80
70 X 10	5.50	160 X 20	25.10
70 X 15	8.24	160 X 25	31.40
70 X 20	11.00	160 X 40	50.20
70 X 25	13.70	160 X 50	62.80
75 X 5	2.94		
75 X 10	5.89		
75 X 15	8.83		
75 X 20	11.80		
75 X 25	14.70		

HEXAGON BAR



SIZE AF MM	KGS PER METER
10	0.68
11	0.82
12	0.98
13	1.15
14	1.33
15	1.53
16	1.74
17	1.96
18	2.20
19	2.45
20	2.72
22	3.29
24	3.92
25	4.25
27	4.96
30	6.12
32	9.96
36	8.81
40	10.90
41	11.40
46	14.40
48	15.70
50	17.00
52	18.40
55	20.60
60	24.50
65	28.70
70	33.30
76	39.30

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WEIGHT CHARTS FOR STEEL BAR

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STEEL SPECIFICATION COMPARISONS

BS970 : 1970/72 BS970 : 1983	BS970 : 1955 EN SERIES	BS970 : 1970/72 BS970 : 1983	BS970 : 1955 EN SERIES	BS970 : 1970/72 BS970 : 1983	BS970 : 1955 EN SERIES
040A04	2A, 2A/1, 2B	250A53	45	605A37	16C
040A10	2A, 2A/1, 2B	250A58	45A	605M30	16D
040A12	2A, 2A/1, 2B	250A61	45B	605M36	16
040A22	2C, 2D	302S25	5BA	606M36	16M
045M10	32A	303S21	58M	608M38	17
050A20	2C, 2D	303S41	58M	635M15	35I
055M15	2	304S15	58E	637M17	352
060A62	43D	315S16	58H	640A35	111A
060A96	44, 44B	316S16	58J	640M40	111
070A72	42	320S17	58J	653M31	23
070A78	42	321S12	58B, 58C	655M13	36A
070M20	3A, 3C	321S20	58B, 58C	659M15	39A
070M55	9	325S21	58M	665A22	35A
080M15	32C	331S40	54	665A24	35B
080A27	5A	331S42	54A	665M17	34
080A30	5B	347S17	54F, 58G	665M23	35
080A32	5C	401S45	52	708A37	19B
080A35	8A	410S21	56A	708A42	19C
080A37	8B	416S21	56AM	708M40	19A
080A40	8C	416S29	56BM	709M40	19
080A42	8D	416S37	56CM	722M24	40B
080A47	43B	416S41	56AM	735A50	47
080A52	43C	420S29	56B	785M19	13
080A67	43E	420S37	56C	805M17	361
080M15	32C	420S45	56D	805M20	362
080M30	5	430S17	60	805M25	363
080M40	8	431S29	57	815M17	353
080M50	43A	443S65	509	816M40	110
120M36	15B	503A37	12B	817M40	24
130M15	201	503A42	12C	820M17	354
150M19	14A, 14B	503M40	12	822M17	355
150M28	14A, 14B	523A14	206	826M31	25
150M36	15	526M60	11	826M40	26
210M15	32M	527A19	207	830M31	27
212A37	8BM	527A60	48	832M13	36C
212A42	8DM	530A30	18A	835M15	39B
212M36	8M	530A32	18B	835M30	30B
212M44	8M	530A36	18C	897M39	40C
214M15	202	530A40	18D	905M31	41A
216M36	15AM	530M40	18	905M39	41B
220M07	1A	534A99	31	945A40	100C
230M07	1A	535A99	31	945M38	100
240M07	1B	605A32	16B		

REFERENCE SYMBOLS FOR TENSILE STRENGTH RANGES OF HARDENED AND TEMPERED MATERIAL
the various tensile strength rates for the different specifications have been designated with the reference symbols P to Z.

NOTE: Tensile strength is governed by ruling section of bar when being heat treated.

For further details please consult
BS970 : 1983 Part 1

REFERENCE SYMBOL	TENSILE STRENGTH N/mm ²
P	550 - 700
Q	625 - 775
R	700 - 850
S	775 - 925
T	850 - 1000
U	925 - 1075

REFERENCE SYMBOL	TENSILE STRENGTH N/mm ²
V	1000 - 1150
W	1075 - 1225
X	1150 - 1300
Y	1225 - 1375
Z	1550 MIN



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STEEL HARDNESS & TENSILE COMPARISONS

BRINELL DIA OF IMPRESSION	BRINELL HARDNESS NUMBER	VICKERS HARDNESS NUMBER	ROCKWELL C SCALE HARDNESS NUMBER	TENSILE STRENGTH	TENSILE STRENGTH	TENSILE STRENGTH
mm	HB	HV	HRC	ton f/in ²	KG f/mm ²	N/mm ²
2.50	(601)	640	57	---	---	---
2.55	(578)	615	56	---	---	---
2.60	(555)	591	54.5	---	---	---
2.65	(534)	569	53.5	---	---	---
2.70	(514)	547	52	---	---	---
2.75	(495)	528	51	---	---	---
2.80	(477)	508	49.5	---	---	---
2.85	(461)	491	48.5	101	160	1569
2.90	444	474	47	98	155	1520
2.95	429	455	45.5	95	150	1471
3.00	415	440	44.5	92	145	1422
3.05	401	425	43	88	139	1363
3.10	388	410	42	85	134	1314
3.15	375	396	40.5	82	129	1265
3.20	363	383	39	80	126	1236
3.25	352	372	38	77	121	1187
3.30	341	360	36.5	75	118	1157
3.35	331	350	35.5	73	114	1118
3.40	321	339	34.5	71	111	1089
3.45	311	328	33	68	107	1049
3.50	302	319	32	66	104	1020
3.55	293	309	31	64	101	990
3.60	285	301	30	63	99	971
3.65	277	292	29	61	96	941
3.70	269	284	27.5	59	93	912
3.75	262	276	26.5	58	91	892
3.80	255	269	25.5	56	89	873
3.85	248	261	24	55	87	853
3.90	241	253	23	53	84	824
3.95	235	247	22	51	81	794
4.00	229	241	20.5	50	79	775
4.05	223	235	---	49	77	755
4.10	217	228	---	48	76	745
4.15	212	223	---	46	73	716
4.20	207	218	---	45	71	696
4.30	197	208	---	43	68	667
4.40	187	197	---	41	65	637
4.50	179	189	---	39	62	608
4.60	170	179	---	36	57	559
4.70	163	172	---	35	55	539
4.80	156	165	---	34	54	530
4.90	149	157	---	32	51	500
5.00	143	150	---	31	49	481
5.10	137	144	---	31	49	481
5.20	131	138	---	30	47	461
5.30	126	133	---	29	46	451
5.40	121	127	---	28	44	431
5.50	116	122	---	27	43	422
5.60	111	117	---	26	41	402
5.70	107	113	---	25	39	382
5.80	103	108	---	24	38	373

The figures in parenthesis require a 'modified' Brinell test, i.e a tungsten carbide ball is required where BH value exceeds 450 HB to HV and HV to HRC conversions are based on A.S.T.M. E.140

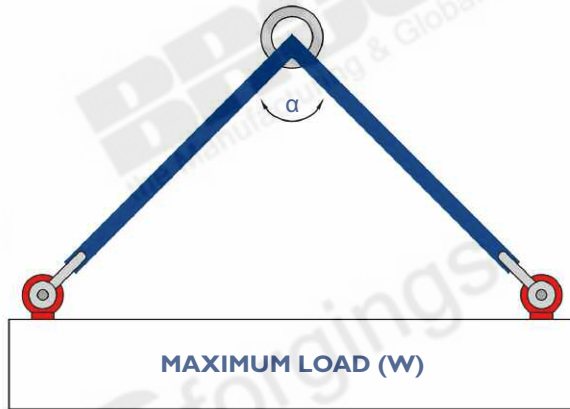
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COLLARED EYEBOLT WORKING LOAD CHART

- INFORMATION BASED ON BS 4278 : 1984



NOTE: THIS METHOD IS CORRECT FOR COLLARED EYEBOLTS AS ILLUSTRATED AND EYEBOLTS WITH LINK

IT IS NOT PERMISSIBLE FOR DYNAMO EYEBOLTS WHICH ARE DESIGNED FOR AXIAL LIFT ONLY.

METRIC THREADS

Maximum recommended working loads for collared eyebolts (**metric threads**) when used in pairs for inclined loading conditions.

SAFE WORKING LOAD SINGLE EYEBOLT AXIAL	MAXIMUM LOAD (W) TO BE LIFTED BY A PAIR OF EYEBOLTS WHEN THE ANGLE BETWEEN SLING LEGS IS:		
	$0^\circ < \alpha \leq 30^\circ$	$30^\circ < \alpha \leq 60^\circ$	$60^\circ < \alpha \leq 90^\circ$
tonnes	tonnes	tonnes	tonnes
0.4	0.5	0.32	0.2
0.8	1.0	0.64	0.4
1.6	2.0	1.25	0.8
2.5	3.2	2.0	1.25
4.0	5.0	3.2	2.0
6.3	8.0	5.0	3.2
8.0	10.0	6.3	4.0
10.0	12.5	8.0	5.0
12.5	16.0	10.0	6.3
16.0	20.0	12.5	8.0
20.0	25.0	16.0	10.0
25.0	32.0	20.0	12.5
REDUCTION FACTOR	0.63	0.4	0.25

IMPERIAL THREADS

Maximum recommended working loads for collared eyebolts (**imperial threads**) when used in pairs for inclined loading conditions.

SAFE WORKING LOAD SINGLE EYEBOLT AXIAL	MAXIMUM LOAD (W) TO BE LIFTED BY A PAIR OF EYEBOLTS WHEN THE ANGLE BETWEEN SLING LEGS IS:		
	$0^\circ < \alpha \leq 30^\circ$	$30^\circ < \alpha \leq 60^\circ$	$60^\circ < \alpha \leq 90^\circ$
tonnes	tonnes	tonnes	tonnes
0.25	0.32	0.2	0.13
0.5	0.63	0.4	0.25
0.9	1.13	0.72	0.45
1.4	1.76	1.12	0.7
2.0	2.52	1.6	1.0
2.75	3.47	2.2	1.38
3.5	4.41	2.8	1.75
4.5	5.67	3.6	2.25
6.5	8.19	5.2	3.25
9.0	11.34	7.2	4.5
12.0	15.12	9.6	6.0
15.0	18.9	12.0	7.5
20.0	25.2	16.0	10.0
30.0	37.8	24.0	15.0
REDUCTION FACTOR	0.63	0.4	0.25

SAFE WORKING LOAD SINGLE EYEBOLT AXIAL	MAXIMUM LOAD (W) TO BE LIFTED BY A PAIR OF EYEBOLTS WHEN THE ANGLE BETWEEN SLING LEGS IS:		
	$0^\circ < \alpha \leq 30^\circ$	$30^\circ < \alpha \leq 60^\circ$	$60^\circ < \alpha \leq 90^\circ$
tonnes	tonnes	tonnes	tonnes
1.0	2.0	1.6	1.25
1.6	3.2	2.5	2.0
2.5	5.0	4.0	3.2
4.0	8.0	6.3	5.0
6.3	12.6	10.0	8.0
REDUCTION FACTOR	1.0	0.8	0.63

IMPERIAL & METRIC THREADS

Maximum recommended working loads for collared eyebolts with links (**imperial & metric threads**) when used in pairs for inclined loading conditions.

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