

# EYE BOLTS & EYE NUTS

## Eye Bolts – some common problems

Eye bolts are widely used for a variety of purposes including lifting operations. However, many people misunderstand the limitations of eye bolts and this can cause dangerous situations to arise. All eye bolts are held in place by the thread. Obviously, the length of the thread engagement is important but also the type of thread. Fine threads are unsuitable for lifting purposes as they provide insufficient landing area. A common error is to over-tighten eye bolts which should only be tightened by hand. Even tightening by hand can stress small diameter threads so for lifting purposes a minimum thread diameter of 12 mm is recommended. The collar must be properly seated against the substrate. For this reason the tread on lifting eye bolts is relieved with a small recess at the junction of the collar to the thread to ensure a totally flat mating surface. Dynamo eye bolts were originally designed to be fixed into the tapped hole on the top of dynamos. The hole was in the centre of gravity and they were designed only to ever take a straight pull. Off axis loading by just 5° can stress the eye bolt. Collared eye bolts can take reduced loads at angles but only in the plane of the eye. If the eye bolts are to be used for bridles it will be unlikely that hand-tightening the eyes will result in alignment of the plane of the eyes within 5°. In this case fine shims will need to be added until the eye bolts align. To avoid this alignment problem Flints stocks the Starpoint VRS eye bolt that adjusts to the direction of the load and is an excellent solution for lifting items where the alignment may change during rigging [speaker cabinets or permanently installed multi-purpose lifting points etc.].

All lifting operations should be carried out by a competent person.

## Weight Loadings

Flints uses the information supplied by the manufacturers to give you an indication of the strength of the product. It can get a bit confusing! Generally speaking the Safe Working Load [SWL] is the same as the Working Load Limit [WLL], never more. The Working Load Limit is the maximum design load of the product, you may enforce a lower SWL for certain applications. This is generally expressed in kilogrammes [kg] or tonnes [t]. Some manufacturers express the strength as the Minimum Breaking Load MBL. We use Min BL because occasionally manufacturers use a "mean" breaking load. This is sometimes expressed as kilonewtons [kN] a unit of force. This can be converted to kg [page 162] but strictly speaking it is kgf – kilogram force. You will then need to apply your own safety factor.

## Adjusting ratings for non-vertical loads

If it is stated that a load may be applied at an angle then the working load limit should be reduced as follows. If the direction of the pull is 45° the adjusted working load will be 30% of rated load. If the pull is 90° the adjusted working load will be 25% of the rated load.

**N.B.** The pull must be in the same plane as the eye [+/- 5°].

**N.B.** For lifting purposes choose eye bolts M12 or greater.

## EYE BOLTS



### Drop Forged Collared Long and Short Shank Eye Bolts

Tested and certified. Unlike Dynamo eye bolts these may be used with loads applied at angles although the pull must

be in the same plane as the eye. Suitable for trunion lifting. Safe working loads will be reduced, see box 📦. Choose M12 threads for lifting purposes. Self-colour.

Drop Forged Collared Long/Short Shank Eye Bolts				code	price
thread Ø	thread length	int. eye Ø	vertical SWL		
M10	18 mm	14 mm	250 kg	WIR15110	£2.18
M12	18 mm	14 mm	400 kg	WIR15112	£2.81
* M12	178 mm	18 mm	400 kg	WIR15662	£12.60

The above eye bolts comply to British Standards as follows:

Short Shank code WIR15112 to BS 4278 Part 1 1984.

[The scope of this standard starts at M12 - the M10 is machined from an M12 forging].

\* Long Shank code WIR15662 did conform to BS 529 Part 1 1944 but this standard has now been withdrawn.



### Crosby Forged Steel Rated Eye Bolts With Nuts [Type G277]

Made from forged steel, then hot-dip galvanised. Supplied with a hot-dip galvanised heavy hex nut. UNC Thread. These bolts are supplied with fitting instructions. The ultimate load is five times the manufacturer's working load. Loads may be applied at an angle [in the plane of the eye] but in these cases the collars of the bolts must be secured flush to the load surface. The rating must be reduced as shown in the information box at the top of this column. For vertical loads the shank may protrude. Although the bolts are supplied with nuts we also stock spare nuts as replacements or as locking nuts.

Crosby Forged Steel Rated Eye Bolts with Nuts [Type G277]				code	price
thread Ø	thread length	int. eye Ø	vertical WLL		
3/8"	114 mm	19.1 mm	700 kg	CRO2776	£19.30
1/2"	152 mm	25.4 mm	1,180 kg	CRO2778	£27.85

Spare Nuts for above		code	price
3/8"		CRO88317	£3.25
1/2"		CRO88305	£1.47



### Crosby Forged Steel-Rated Short Shank Eye Bolts [Type M279]

Made from quenched and tempered forged steel. Designed to be inserted into

a tapped hole of at least the tapped length plus one half the diameter of the bolt. These bolts are supplied with fitting instructions. The ultimate load is five times the manufacturer's working load. Loads may be applied at an angle in the plane of the eye but ratings must be reduced as shown in the information box 📦.

Crosby Forged Steel-R Short Shank [Type M279]				code	price
thread Ø	thread length	int. eye Ø	vertical WLL		
M6	13 mm	19.1 mm	200 kg	CRO2792	£22.41
M8	13 mm	22.4 mm	400 kg	CRO2794	£25.65
M10	17 mm	25.4 mm	640 kg	CRO2796	£28.88
M12	20.5 mm	30.2 mm	1,000 kg	CRO2798	£34.33

## DYNAMO EYE BOLTS



**Long Shank Dynamo Eye Bolts** Commercial quality drop forged eye bolts, intended to fix through a surface material with a hex nut to provide a single fixing point. The load must be a vertical pull and the bolt must be tightened down to the shoulder. Self-colour.

Long Shank Dynamo Eye Bolts				code	price
thread Ø	thread length	int. eye Ø	vertical SWL		
3/8"	4"	7/8"	250 kg	WIR424	£4.98
1/2"	4"	1 1/8"	320 kg	WIR425	£5.45
8 mm	100 mm	21 mm	150 kg	WIR426	£3.93
10 mm	100 mm	21 mm	250 kg	WIR427	£3.97
12 mm	100 mm	28 mm	320 kg	WIR429	£4.99



**Short Shank Dynamo Eye Bolts** These eye bolts are primarily designed to go into tapped holes. The manufacturer's SWL will only apply if the tap depth is the full threaded length plus

one half the diameter. The ultimate load is four times the manufacturer's vertical SWL. Suitable for vertical loads only. Self-colour.

Short Shank Dynamo Eye Bolts				code	price
thread Ø	thread length	int. eye Ø	vertical SWL		
3/8"	3/4" BSW	13/16"	5 cwt	WIR420	£6.10
1/2"	1" BSW	1 1/8"	10 cwt	WIR421	£2.86
8 mm	18 mm	21 mm	150 kg	WIR419	£1.90
10 mm	18 mm	21 mm	250 kg	WIR422	£1.54
12 mm	18 mm	21 mm	320 kg	WIR423	£1.95

## COMMERCIAL FOLDED AND WELDED EYE BOLTS



**Folded and Welded Eye Bolts** A commercial quality straining eye bolt suitable for light duty non-lifting applications. Supplied with nut and washer. Zinc-plated.

Folded and Welded Eye Bolts			code	price
thread Ø	L [nom length +/- 5%]			
1/4"	6"		FIX3075	£1.38
5/16"	6"		FIX3073	£1.21
3/8"	6"		FIX3071	£1.38

Other sizes available to order up to 18" x 3/8".

## STEEL EYE NUTS



**Eye Nuts** Made from C15 carbon steel to Din 582 with a safety factor of 4:1. Other sizes available to order. Self-colour.

Eye Nuts	thread Ø	D3	WLL	code	price
M6		20 mm	70 kg	WIR17306	£1.23
M8		20 mm	140 kg	WIR17308	£1.86
M10		25 mm	230 kg	WIR17310	£2.44
M12		30 mm	340 kg	WIR17312	£2.99

## STAINLESS STEEL EYE BOLTS



**Small Stainless Steel Eye Bolts** Smart collared eye bolt from AISI 304 marine-grade stainless steel ideal for securing small handrail or display wires.

Small SS Eye Bolts			Min BL	code	price
thread Ø	thread length	int. eye Ø	kgf		
M6	50 mm	13 mm	1,300 kg	WIR370650	£7.81
M6	100 mm	13 mm	1,300 kg	WIR370600	£8.20
M8	50 mm	15 mm	2,400 kg	WIR370850	£8.80
M8	100 mm	15 mm	2,400 kg	WIR370800	£10.52



**Short Shank Stainless Steel Eye Bolts** Manufactured to Japanese Industrial Standard [JIS B 1168] from AISI 316 marine-grade stainless steel.

Short Shank SS Eye Bolts			Min BL	code	price	
thread Ø	thread length	int. eye Ø	kN	kgf		
M6	10 mm	15 mm	8.2 kN	835 kg	WIR8316SS	£1.31
M8	15 mm	20 mm	14.5 kN	1,478 kg	WIR8318SS	£1.53
M10	18 mm	25 mm	22.6 kN	2,303 kg	WIR83110SS	£2.41
M12	22 mm	30 mm	32.6 kN	3,323 kg	WIR83112SS	£3.63



**Long Shank Stainless Steel Eye Bolts** Made from AISI 316 marine-grade stainless steel. Supplied with nut and washer.

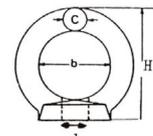
Long Shank SS Eye Bolts			Min BL	code	price	
thread Ø	thread length	int. eye Ø	kN	kgf		
M6	60 mm	15 mm	8.2 kN	835 kg	WIR812660SS	£1.60
M8	80 mm	20 mm	14.5 kN	1,478 kg	WIR812880SS	£1.72
M10	100 mm	25 mm	22.6 kN	2,303 kg	WIR81210100SS	£2.84
M12	120 mm	30 mm	32.6 kN	3,323 kg	WIR81212120SS	£4.71



**Stainless Steel Eye Bolts with Ring** Made from AISI 316 marine-grade stainless steel. Supplied with nut and washer.

SS Eye Bolts with ring			Min BL	code	price	
thread Ø	thread length	int. ring Ø	kN	kgf		
M6	74 mm	35 mm	7.0 kN	713 kg	WIR8136100SS	£1.60
M8	60 mm	45 mm	12.4 kN	1,264 kg	WIR8138100SS	£2.39
M10	90 mm	50 mm	19.4 kN	1,977 kg	WIR81310150SS	£3.83

## STAINLESS STEEL EYE NUTS



**Stainless Steel Eye Nuts** Made to Din 582 from AISI 316 marine-grade stainless steel.

SS Eye Nuts			Min BL	code	price	
thread Ø	H	b	kN	kgf		
M6	28 mm	16 mm	6.2 kN	632 kgf	WIR103206	£1.15
M8	33 mm	20 mm	8.2 kN	836 kgf	WIR103208	£1.20
M10	42 mm	25 mm	13.5 kN	1,376 kgf	WIR103210	£2.08
M12	51 mm	30 mm	20 kN	2,039 kgf	WIR103212	£3.25

## SPECIALITY EYE BOLTS



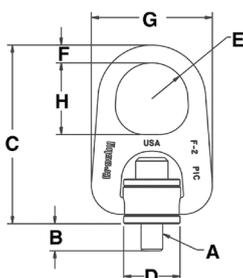
**Starpoint VRS F** Often referred to as "Pink Ladies". The pull on most eye bolts has to be restricted to the plane of the eye but the Starpoint VRS adjusts through 360° to align with the direction of pull. The star-shaped design and striking fluorescent pink powder coating clearly distinguishes it from other eye bolts. Each bolt has a clear WLL

indication for the most unfavourable load direction. Made from high tensile and annealed forged material 1.6541. 100% electromagnetic crack detected to EN 1677-1. With a 4:1 design factor. Refer to flints.co.uk/downloads for data sheets.

- ✓ Ideal for bridle applications as there is no need for shims
- ✓ Safest option for hanging points when the final pull direction can not be pre-determined
- ✓ Clearly visible pink marking for reassurance
- ✓ Rated to the most unfavourable load

Starpoint VRS-F	thread Ø	WLL	weight	code	Tradeline
VRS-F-M10	M10	400 kg	100 g	WIR7104029	£37.08
VRS-F-M12	M12	750 kg	200 g	WIR7101313	£45.76

## HOIST RINGS

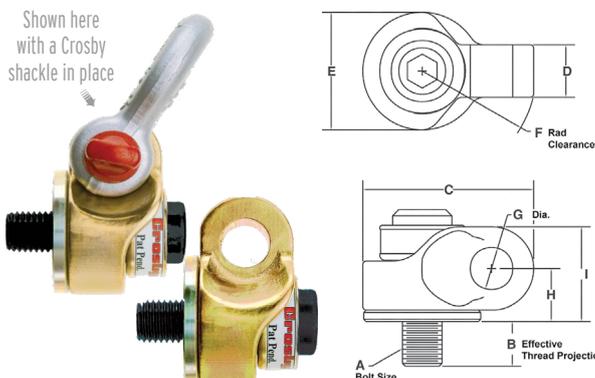


**Crosby® HR-1000M Heavy Lift Swivel Hoist Rings** This heavy duty hoist ring will self-adjust to the load direction without compromising the WLL. The larger eye on this ring will allow for a bigger component to connect than a typical eyebolt - eg the user could easily hook on a chain hoist, without needing additional components. RFID equipped for easy identification and security for sites with the necessary infrastructure. Individually stamped with Crosby® or "CG", PIC [Product Identification Code], WLL, and recommended torque value for traceability and ease of use. They are also individually proof tested to 2.5 x stated WLL. We've opted to stock two sizes, but all Crosby® products are available to order. Please note, the full thread length must be fully engaged with the work piece, rather than passed through and secured with a nut - they should be fitted using a torque wrench set to the recommended torque. The user should always follow manufacturer's assembly and safety guidance.

HR 1000 Hoist Rings	dimensions [mm]								WLL [5:1]	weight	torque
size [A]	B	C	D	E(r)	F	G	H				
M12	15.5	162	49.8	31.8	19.1	107	63.5	1050 kg	1.5 kg	38 Nm	
M20	30.5	162	49.8	31.8	19.1	107	63.5	2150 kg	1.6 kg	136 Nm	

HR 1000 Hoist Rings	code	list	price
M12	CRO1068325	£200.72	£194.63
M20	CRO1068343	£203.84	£198.13

For torque wrenches see page 174



**Crosby® HR-1200M Side Pull Hoist Rings** The primary benefit of using these is that the user can gain extra height when positioning a work piece compared to a top mounted ring; they are rated at 100% WLL for angles up to 90°. Simply use a shackle to connect to a wire rope/sling, passing the pin through the ring for maximum security and loading. Crosby® recommend using their own red pin shackles (page 181) and we have listed the recommend sizes and codes below. Individually stamped with a PIC [Product Identification Code] for material traceability, along with the WLL. They are individually proof tested to 2.5 x stated WLL. We've opted to stock three sizes, but all Crosby® products are available to order. Please note, the full thread length must be fully engaged with the work piece rather than passed through and secured with a nut - they should be fitted using a torque wrench set to the recommended torque. The user should always follow manufacturer's assembly and safety guidance.

HR 1200 Side Pull Rings	dimensions [mm]								WLL [5:1]	weight	torque
size [A]	B	C	D	E	F	G	H	I			
M8	16.9	49	18.3	25.4	39.6	20.3	21.6	36.3	300 kg	1.5 kg	10 Nm
M10	16.9	49	18.3	25.4	39.6	20.3	21.6	36.3	400 kg	1.5 kg	16 Nm
M12	17.2	75.4	24.6	50.8	54.1	23.6	27.2	45.5	1000 kg	1.5 kg	38 Nm

HR 1200 Side Pull Rings	code	list	price
Crosby compatible shackles			
M8	2 t CRO2096 / 3.25 t CRO2097	CRO1067803	£122.73 £119.15
M10	2 t CRO2096 / 3.25 t CRO2097	CRO1067807	£124.80 £121.21
M12	3.25 t CRO2097 / 4.75 t CRO2109	CRO1067811	£147.68 £143.35

To see the full spec and pricing of the compatible shackles recommended by Crosby® see page 181. For torque wrenches see page 174