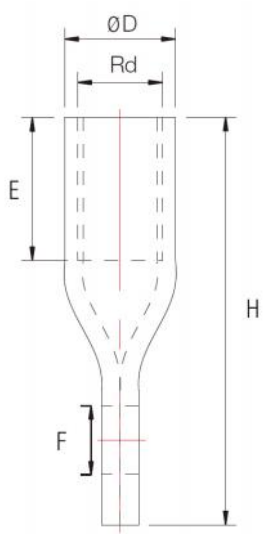
Threaded Socket System

HULKMETAL

Flat End Lifting Socket



Flat End Lifting Socket						
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable					
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized					
SAFETY FACTOR	≥ 3					
CERTIFICATE	CE / ISO 9001					
SWL (tons)	CODE	THREAD (RD/M)	H(mm)	D(mm)	E(mm)	F(mm)
0.5	FELS-M/RD12-60	12	60	15	22	10
0.8	FELS-M/RD14-70	14	70	18	25	11
1.2	FELS-M/RD16-77	16	77	21	27	13
1.6	FELS-M/RD18-85	18	85	24	34	13
2.0	FELS-M/RD20-92	20	92	27	35	15.5
2.5	FELS-M/RD24-100	24	100	31	43	18

Flat-end lifting sockets are tapped, extruded, and punched from stainless steel or high-performance carbon steel.

Carbon steel Flat-end lifting sockets are surface treated for excellent rust resistance.

It Can pass the 3 times of safety factors tests.

Passed CE certification.

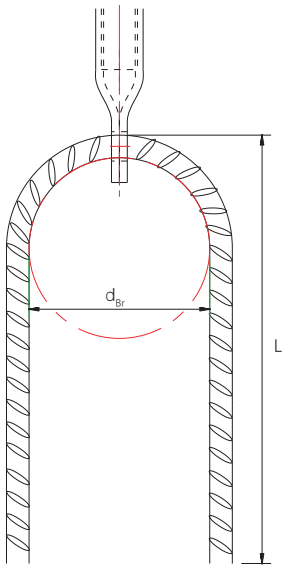
It has Rd and M threads to choose from.

Flat end lifting sockets are always used with reinforcement and their characteristics are shown in the table below:

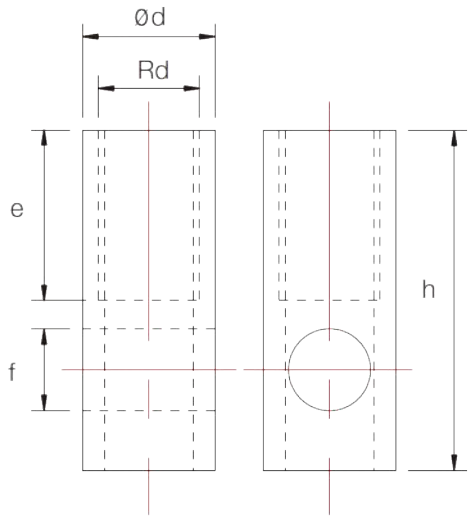
Diameter and Dimensions of Reinforcing Steels

Code	Armature [mm]	Ø d_{Br} [mm]	Formant	
			L [mm]	Cutting Length [mm]
FS-M/RD12-60	8	24	240	490
FS-M/RD14-70	8	32	280	570
FS-M/RD16-77	10	40	330	670
FS-M/RD18-85	10	40	420	850
FS-M/RD20-92	12	48	440	890
FS-M/RD24-100	14	56	480	970

The length of the reinforcements is defined for a minimum concrete strength of 15 MPa.



Tubular Lifting Socket

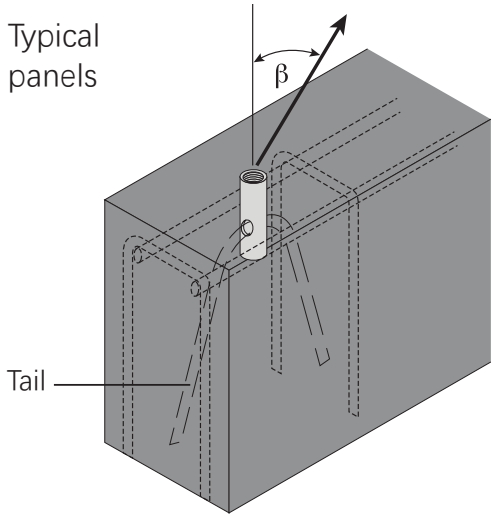


Tubular Lifting Socket						
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable					
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized					
SAFETY FACTOR	≥ 3					
CERTIFICATE	CE / ISO 9001					
SWL (tons)	**CODE**	**THREAD (RD/M)**	**h (mm)**	**d (mm)**	**e (mm)**	**f (mm)**
0.5	TS-M/RD12-40	12	40	15.0	22	8.0
0.8	TS-M/RD14-47	14	47	18.0	25	10.5
1.2	TS-M/RD16-55	16	55	21.0	27	13.0
1.6	TS-M/RD18-65	18	65	24.0	34	13.0
2.0	TS-M/RD20-69	20	69	27.2	35	15.5
2.5	TS-M/RD24-78	24	78	31.0	43	18.0
4.0	TS-M/RD30-105	30	105	39.5	56	22.5
6.3	TS-M/RD36-125	36	125	47.0	68	27.5
8.0	TS-M/RD42-145	42	145	54.0	80	32.0
12.5	TS-M/RD52-195	52	195	67.2	97	40.0

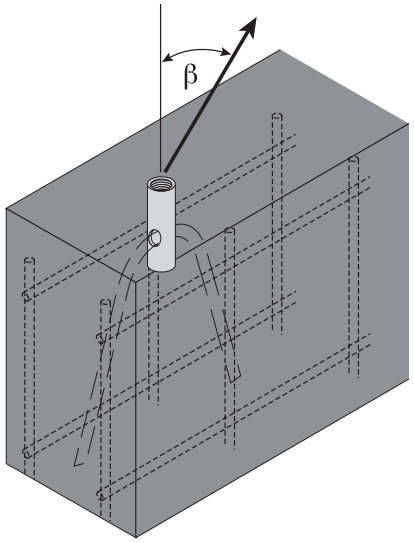
Tubular Lifting Sockets are economic and have advantages in thin components, where the long tail provides excellent anchorage. The reinforcement tail is essential and must be installed as shown in the picture by the precaster.
Tubular Lifting Sockets are available in stainless steel, Q345, Q235, and 20# steel. They have Rd and M threads to choose from. The sockets are specially made for lifting and are not to be confused with fixing sockets.

For thin units that have to be turned through 180° from mold to the final position, plain sockets can be made double-threaded to pass right through the unit.
Safe working loads shown are after the application of a safety factor on the test of 2 for 15 N/mm^2 concrete and 3 for steel. The actual working load must be calculated.

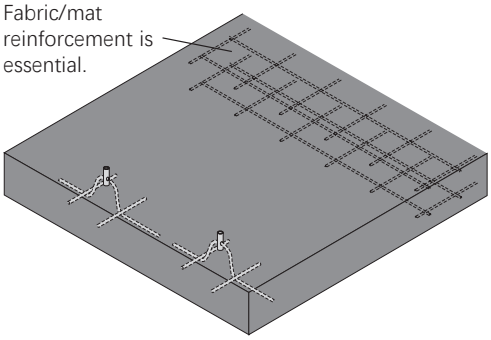
The details on these pages show panels, but they could equally apply to other components. The loads shown assume the angle of lift, i.e. β ⩽ 30° , and normal reinforcement such as a cage or two layers of mesh. Turning/pitching panels reduces the allowable load as shown below.



β ⩽ 12.5° Reinforcement cage Typically T12 bars full length T8 stirrups at 150 mm centres

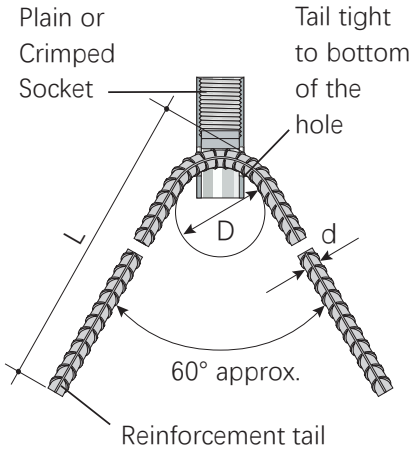


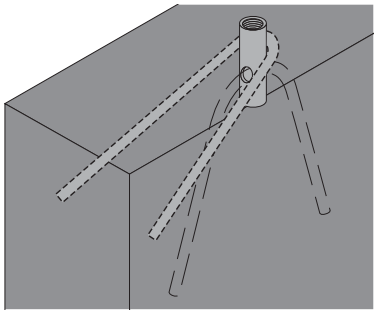
β ⩽ 12.5° Reinforcement cage Typically T12 bars full length T8 stirrups at 150 mm centers. Two layers of mesh Typically 8 mm wire.

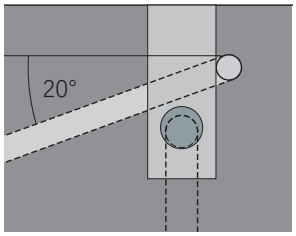


Reinforcement tails are typically U bars, but in slabs, the anchorage reinforcement may be cranked as depicted. It is important to avoid using completely straight bars. The bars should be laid over the cranked bars, as illustrated.
Minimum er assumes that the reinforcement cover is satisfactory to the designer: stainless steel might be necessary if the cover is restricted.

d mm	D mm	L mm	Unbent length mm
6	26	240	500
10	40	330	700
12	48	440	925
12	48	480	1000
16	64	650	1350
20	140	820	1700
25	175	860	1825
25	196	1200	2500







Lateral reinforcement for 12.5° < β < 45°

Insert. Dia	Reinforcement		
	dia.	Unbent Length	
12	6	400*	Allowable load as main table shown opposite
16	8	650*	
20	8	900*	
24	12	950*	
30	12	1200*	
36	16	1500*	
42	16	1700*	
52	20	2100*	

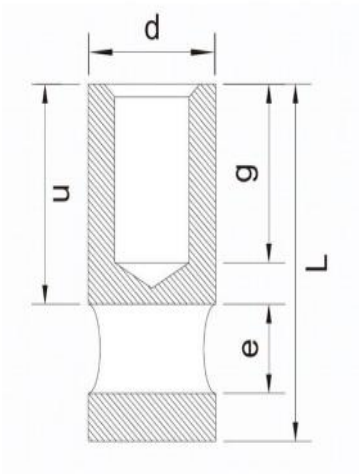
Turning/pitching reinforcement for slabs

Additional reinforcement is required where sockets are inserted in the edge for turning/ pitching.

Note:

Even with the additional reinforcement, the SWL is 50% of that shown in the table opposite.

Solid Rod Lifting Socket



Solid Rod Lifting Socket						
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable					
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized					
SAFETY FACTOR	≥ 3					
CERTIFICATE	CE / ISO 9001					
SWL (tons)	CODE	THREAD (RD/M)	L (mm)	d (mm)	g (mm)	e (mm)
0.5	SS-M/RD12-50	12	50	17	22	9.5
0.8	SS-M/RD14-54	14	54	19	26	11.5
1.2	SS-M/RD16-61	16	61	23	30	14.0
1.6	SS-M/RD18-70	18	70	24	34	14.5
2.0	SS-M/RD20-73	20	73	28	38	16.5
2.5	SS-M/RD24-86	24	86	32	46	19.0
4.0	SS-M/RD30-107	30	107	40	58	22.0
8.0	SS-M/RD42-145	42	145	54	80	32.0
12.5	SS-M/RD52-195	52	195	70	100	40.0

1.Solid Rod Lifting Socket is made of high-performance carbon steel rod and stainless steel rod after drilling, tapping, and surface treatment.

2.When it is used, it is necessary to use steel bars to pass through the cross holes to firmly fix it in the concrete unit.

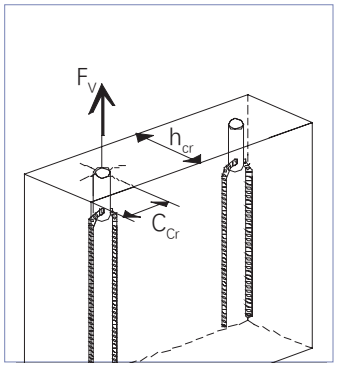
3.It can be used for lifting as well as fixing.

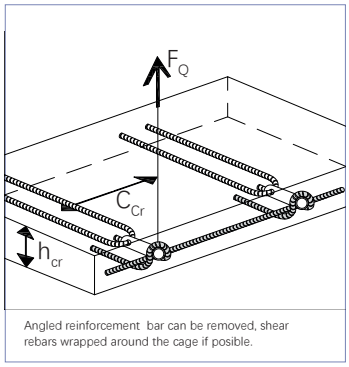
4.The carbon steel Solid Rod Lifting Socket also has excellent rust resistance after being galvanized.

5.It has passed CE certification.

In addition to the properties in the parameter table, we also support OEM services.

Fixing Design Capacities for Solid Rod Lifting Sockets:





These tables are for these sockets to be used as fixing points. They should be compared to the design loads on the socket.

These tables show a typical situation and you should check that your situation is within these parameters.

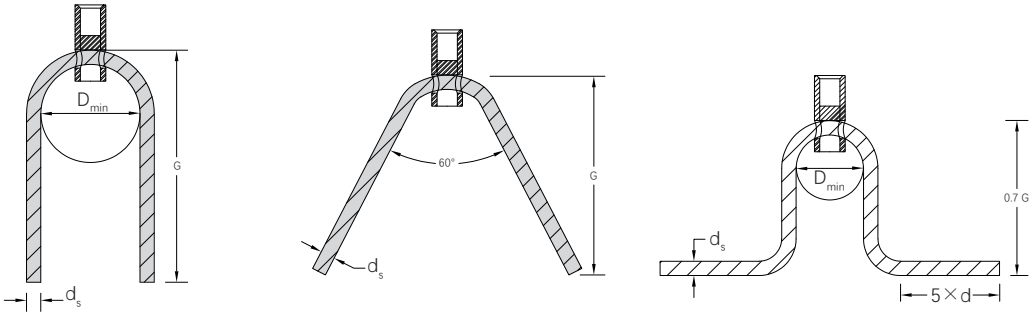
Where two or more sockets are in use, they should be spaced at a minimum of $2xC_{cr}$ apart.

Minimum reinforcement of two layers of 131mm^2/m mesh.Minimum concrete strength = 25N/mm^2

Part No.	Typical Installation Conditions		Axial Load	Shear Load
	Edge Distance C_{cr}	Element thickness h_{cr}	F_V	F_Q
	mm		kN	
SS-M/RD-10	140	80	10	4.6
SS-M/RD-12	140	80	15	6.6
SS-M/RD-16	180	100	22.5	10.0
SS-M/RD-20	250	120	45	19.5
SS-M/RD-24	300	120	50	20.8
SS-M/RD-30	350	160	65	33.5

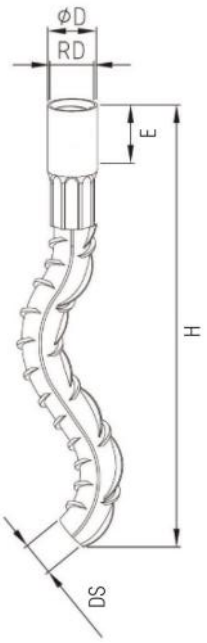
Solid rod lifting sockets must be used with anchorage reinforcement. Without this, they are ineffective and unsafe.

Anchorage Reinforcement For Solid Rod Lifting Sockets:



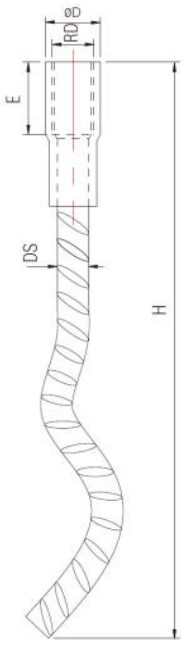
Reinforcement legs should be vertical as shown here, or may be angled up to 60° from the vertical depending on the application.

Short Wavy Lifting Socket



Short Wavy Lifting Socket						
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable					
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized					
SAFETY FACTOR	≥ 3					
CERTIFICATE	CE / ISO 9001					
SWL (tons)	CODE	THREAD (RD/M)	H (mm)	D (mm)	E (mm)	DS (mm)
0.5	SWS-M/RD12-105	12	105	15	22	8
1.2	SWS-M/RD16-165	16	165	21	27	12
2.0	SWS-M/RD20-195	20	195	27	35	14
2.5	SWS-M/RD24-240	24	240	31	43	16
4.0	SWS-M/RD30-300	30	300	40	56	20
6.3	SWS-M/RD36-380	36	380	47	68	25
8.0	SWS-M/RD42-450	42	450	54	80	28

Long Wavy Lifting Socket



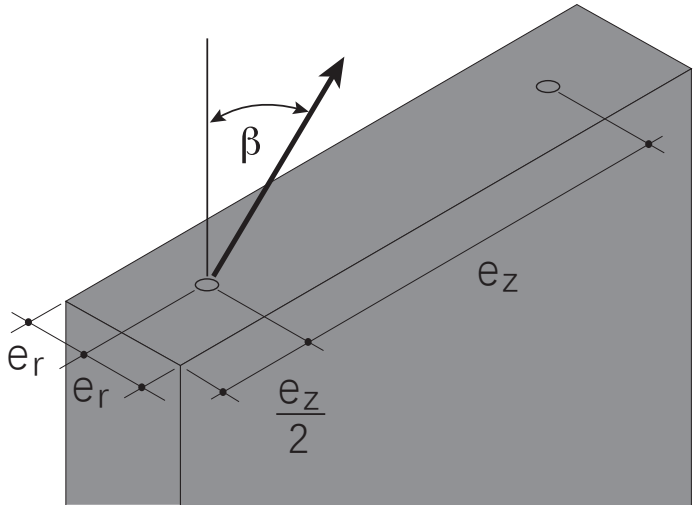
Long Wavy Lifting Socket						
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable					
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized					
SAFETY FACTOR	≥ 3					
CERTIFICATE	CE / ISO 9001					
SWL (tons)	CODE	THREAD (RD/M)	H (mm)	D (mm)	E (mm)	DS (mm)
0.5	LWS-M/RD12-137	12	137	15	22	8
1.2	LWS-M/RD16-216	16	216	21	27	12
2.0	LWS-M/RD20-257	20	257	27	35	14
2.5	LWS-M/RD24-360	24	360	31	43	16
4.0	LWS-M/RD30-450	30	450	40	56	20
6.3	LWS-M/RD36-570	36	570	47	68	25
8.0	LWS-M/RD42-620	42	620	54	80	28

Lifting Socket with Wavy is supplied pre-finished from the factory and comprises of a socket swaged to a wavy reinforcement bar. These sockets are the recommended choice as long as they meet the required length and edge distance for the specific job.

The optimal lifting method is depicted below, with a lifting angle of $\beta \leqslant 30°$.

Materials: Stainless Steel / Q345 / Q235 / 20#

The safe working loads indicated are calculated after applying a safety factor of 2 for 15 N/mm^2 concrete and 3 for steel.



Size	Minimum er mm	Minimum ez mm	Normal reinf.
			main bar dia. mm
Rd12	37	300	10
Rd16	40	400	10
Rd20	50	550	12
Rd24	60	600	12
Rd30	70	650	16
Rd36	100	800	16
Rd42	120	1000	16
Rd52	138	1200	20

Minimum e_r assumes that the reinforcement cover is satisfactory to the designer: stainless steel might be necessary if the cover is restricted.

Lifting on site is usually the worst case due to higher crane factors and a worse angle of lift (β).

Yard, e.g. demould

$F = [G + (q \times A) \times f \times Z] / n$

Site – handling

$F = G \times f \times Z / n$

i.e. factors f and Z are usually worse on site

F = load per insert when lifting

G = dead weight of unit

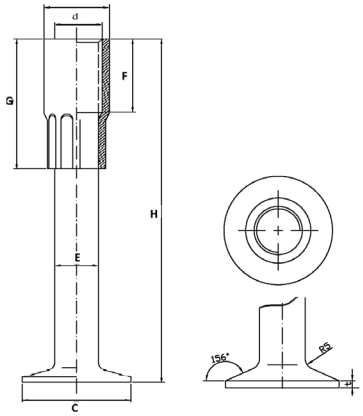
Q×A = adhesion to the mould

f = crane factor

Z = factor for angle β

n = number of inserts

Combi Lifting Socket

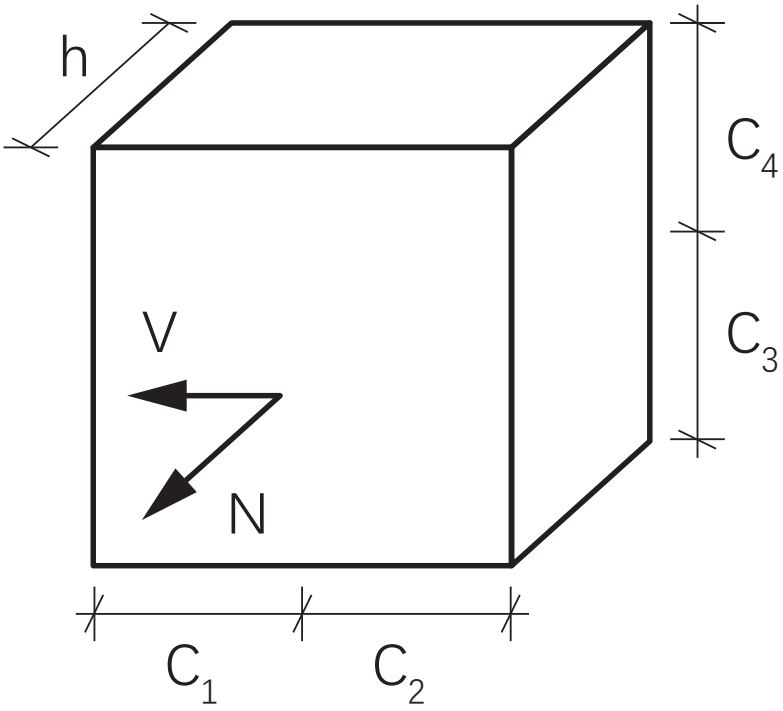


Combi Lifting Socket								
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable							
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized							
SAFETY FACTOR	≥ 3							
CERTIFICATE	CE / ISO 9001							
THREAD (M/Rd)	CODE	H (mm)	D (mm)	d (mm)	C (mm)	E (mm)	F (mm)	G (mm)
12	CLS-M/Rd12-057	57	17	12	25	10	22	45
	CLS-M/Rd12-070	70	17	12	25	10	22	45
	CLS-M/Rd12-100	100	17	12	25	10	22	45
16	CLS-M/Rd16-070	70	22	16	35	10	27	55
	CLS-M/Rd16-140	140	22	16	35	13	25	55
20	CLS-M/Rd20-090	90	27	20	45	16	34	67
	CLS-M/Rd20-180	180	27	20	45	16	34	68
	CLS-M/Rd20-240	240	27	20	45	16	34	68
	CLS-M/Rd20-360	360	27	20	45	16	34	68
24	CLS-M/Rd24-105	105	32	24	50	19	40	86
	CLS-M/Rd24-200	200	32	24	50	19	40	86
30	CLS-M/Rd30-270	270	39	30	60	22	49	103

Put the tapped sockets on the threaded steel bars or steel rods, and extrude the connection to make a Combi Lifting Socket. The material of the sleeve is Stainless Steel, Q345, Q235, 20#. The surface treatment methods include Row Color, electroplating, and hot-plating.

The safety factor is not less than 3 times. Certified as CE and ISO 9001.

There are two thread types of Combi Lifting Socket: RD and M. Other detailed parameters can refer to the table.

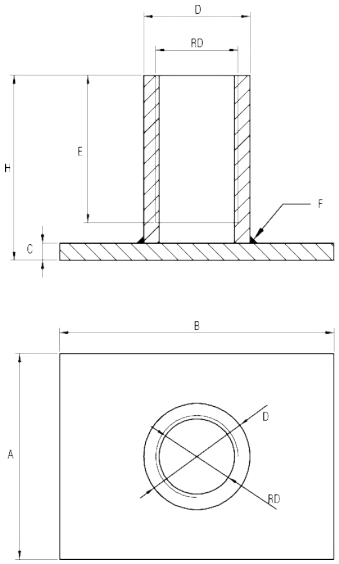


Design Loads Were Calculated Using:

- Cracked Concrete
- For shear loads: $C_3 = C_4 \geqslant 1.5\ C_1$
- For axial load: h ⩾ L + Cnom
- For shear loads: straight edge bar 2 ø x 12, stirrups ø12/ e=100
- Fixing bolt grade 8.8 for SL-P-ZN, grade A4-70 for SL-P-A4 ⩽ H24; A4-50 for H30.

Design resistances are valid for the associated edge distances and element thicknesses (center - center between two combi lifting sockets s > c). However, these are not minimum spacings. Resistances might increase or decrease depending on the fixing condition. By adding supplementary reinforcement resistance can be increased.

Flat Plate Lifting Socket



Flat Plate Lifting Socket								
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable							
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized							
SAFETY FACTOR	≥ 3							
CERTIFICATE	CE / ISO 9001							
SWL (tons)	CODE	THREAD (RD/M)	H (mm)	A (mm)	B (mm)	C (mm)	E (mm)	D (mm)
0.5	FPS-M/RD12-030	12	30	25	35	4	20	16
1.2	FPS-M/RD16-035	16	35	35	50	4	26	21.5
2.0	FPS-M/RD20-047	20	47	60	60	5	35	27
2.5	FPS-M/RD24-054	24	54	60	80	5	36	31
4.0	FPS-M/RD30-072	30	72	80	100	6	52	40
6.3	FPS-M/RD36-084	36	84	100	130	6	60	48
8.0	FPS-M/RD42-098	42	98	130	130	8	70	54
12.5	FPS-M/RD52-117	52	117	130	150	10	97	68

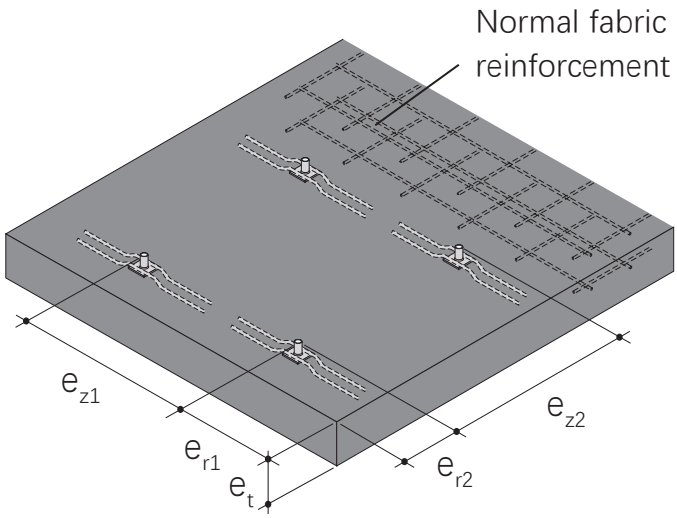
Plate Lifting Sockets are low profile (see **h** in the chart below) and hence are ideal for the face of thin panels or the top of slabs.

It is made of high-performance carbon steel and stainless steel pipes that are tapped and then welded with cut steel plates.

Carbon steel Plate Lifting Sockets have excellent rust resistance after being galvanized.

It has the performance of the safety factor over 3 times. The Plate Lifting Sockets we sell are CE-certified.

In addition to the Code in the parameter table, we also support OEM services.



Size	Min. e_{r1} mm	Min. e_{z1} mm	Min. e_{r2} mm	Min. e_{z2} mm	Min. e_t mm
Rd12	180	360	65	115	70
Rd16	250	500	75	140	85
Rd20	300	600	80	180	100
Rd24	400	800	95	215	115
Rd30	500	1000	120	275	140
Rd36	650	1300	145	330	160
Rd42	650	1300	165	375	175
Rd52	750	1500	190	435	215

Minimum e_{r1} and e_{r2} assumes socket is within the normal cage reinforcement. Cover to the reinforcement must be acceptable to the designer: in some cases stainless steel may be needed.

Lifting on site is usually the worst case due to higher crane factors and worse angle of lift (**β**).

Yard, e.g. demould

$F = [G + (q \times A) \times f \times Z] / n$

Site – handling

$F = G \times f \times Z / n$

i.e. factors f and Z are usually worse on site

Summary calculations

F = load per insert when lifting

G = dead weight of unit

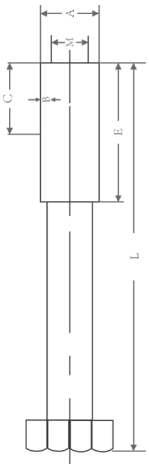
Q×A = adhesion to the mould

f = crane factor

Z = factor for angle β

n = number of inserts

Bolt Anchor Lifting Socket



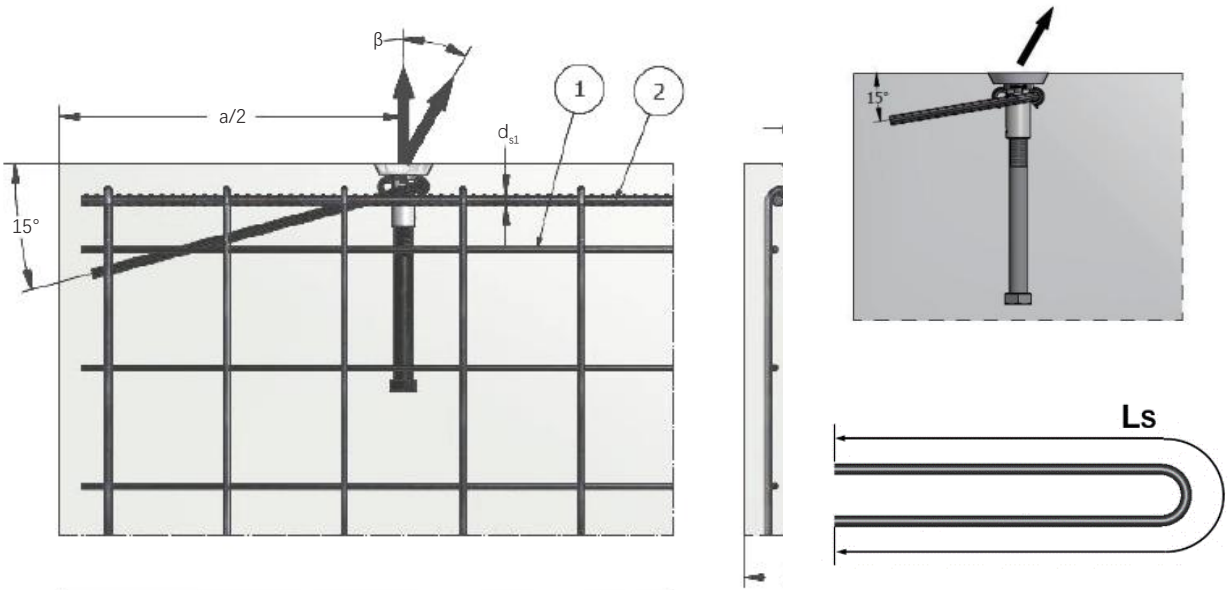
Bolt Anchor Lifting Socket

MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized
SAFETY FACTOR	≥ 3
CERTIFICATE	CE / ISO 9001

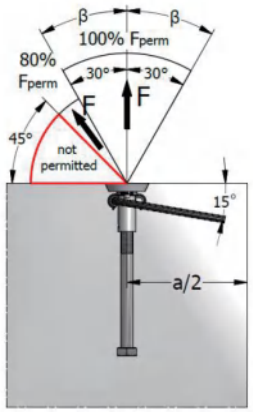
SWL (tons)	CODE	THREAD (M/Rd)	L (mm)	A (mm)	B (mm)	C (mm)	E (mm)
0.5	BS-M12-100	12	100	16	2.8	22	36
	BS-M12-150	12	150	16	2.8	22	36
1.2	BS-M16-140	16	140	22	3.9	30	48
	BS-M16-220	16	220	22	3.9	30	48
2.0	BS-M20-150	20	150	27	4.6	40	60
	BS-M20-180	20	180	27	4.6	40	60
	BS-M20-270	20	270	27	4.6	40	60
2.5	BS-M24-200	24	200	32	5.4	45	72
	BS-M24-320	24	320	32	5.4	45	72
4.0	BS-M30-240	30	240	40	6.6	60	90
	BS-M30-380	30	380	40	6.6	60	90

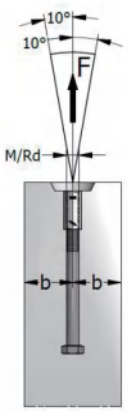
Bolt Anchors Lifting Sockets are made from a threaded bush locked on a standard bolt.
The Sockets are made of high-performance carbon steel and stainless steel and pass threading.
Before leaving the factory, it needs to pass a tensile test with a safety factor of more than 3 times.

Bolt Anchors Lifting Sockets are suitable for shallow embedded elements without the need for a reinforcement tail. The force transfer into the concrete is provided by the bolt head of the screw. For angled lifts, additional reinforcements are necessary. The lift angle must not exceed 30° . For turning/tilting a special tilting reinforcement must be used. In all cases, the standard mesh reinforcement must be present into the concrete element.
Bolt anchor lifting socket - Installation And Reinforcements Reinforcement And Load Capacity – Axial Load Up To 10° Reinforcement And Load Capacity – Diagonal Load Up To 45° .

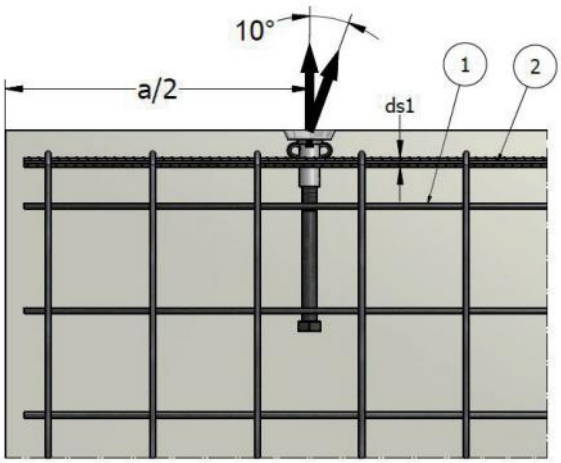


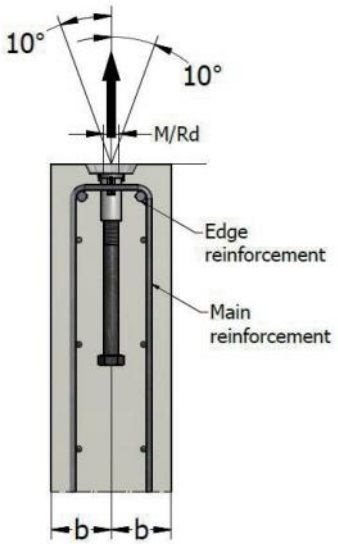
BS-M(Rd)	Load group [t]	Minimum unit thickness 2 x b [mm]	Axial spacing a [mm]	① .Mesh reinforce-ment [mm²/m]	② .Edge reinforce-ment d_{s1} [mm]	③ .Diagonal reinforcement Max.45° , β>30°		Load capacity for lifting loop application		Load capacity for lifting application
						ds [mm]	Ls [mm]	f_{cu}> 15N/mm²	f_{cu}>25N/mm²	f_{cu}>25N/mm²
								[kN]	[kN]	[kN]
M(Rd)12-100	0.5	60	300	1 x 188	Ø8	Ø6	320	4.0	5.0	5.0
M(Rd)16-140	1.2	80	400	2 x 131	2 x Ø8	Ø8	640	9.6	12.0	12.0
M(Rd)20-180	2.0	100	540	2 x 188	2 x Ø10	Ø10	840	16.0	20.0	20.0
M(Rd)24-200	2.5	100	600	2 x 188	2 x Ø10	Ø10	1050	20.0	25.0	25.0
M(Rd)30-240	4.0	120	720	2 x 188	2 x Ø12	Ø12	1260	32.0	40.0	40.0
M(Rd)36-300	6.3	160	900	2 x 188	2 x Ø12	Ø16	1600	44.6	63.0	63.0
M(Rd)42-460	8	200	1380	2 x 188	2 x Ø14	Ø20	2000	64	80	80





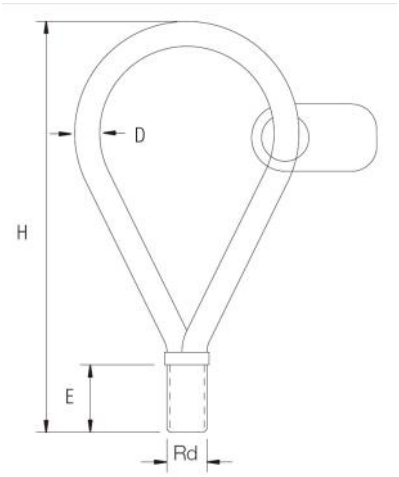
Note: The bending radius will be determined based on EN 1992. The diagonal reinforcement should be positioned in direct contact with the socket anchor. It is important to always install diagonal reinforcement on the opposite side of the load direction. The dimensions in the pictures are in [mm].





BS-M(Rd)	Load group [t]	Minimum unit thickness 2 x b [mm]	Axial spacing a [mm]	① .Mesh reinforcement [mm²/m]	② .Edge reinforcement d_{s1} [mm]	Load capacity	
						fcu> 15N/mm²	fcu>25N/mm²
						[kN]	[kN]
M(Rd)12-100	0.5	60	300	1 x 188	Ø8	5	5
M(Rd)16-140	1.2	70	400	2 x 131	2 x Ø8	12	12
M(Rd)20-180	2	80	540	2 x 188	2 x Ø10	16.9	20
M(Rd)24-200	2.5	100	600	2 x 188	2 x Ø12	25	25
M(Rd)30-240	4	120	720	2 x 188	2 x Ø12	40	40
M(Rd)36-300	6.3	140	900	2 x 188	2 x Ø12	55.7	63
M(Rd)42-460	8	180	1380	2 x 188	2 x Ø14	77	80

Lifting Loop



Lifting Loop					
MATERIAL	Alloy Steel / Carbon Steel / Customizable				
SURFACE TREATMENT	Electro-galvanized				
SAFETY FACTOR	≥ 5				
CERTIFICATE	CE / ISO 9001				
SWL (tons)	CODE	THREAD (RD/M)	H (mm)	E (mm)	D (mm)
0.5	LL-RD/M12-155	12	155	20	6
1.2	LL-RD/M16-165	16	165	27	8
2.0	LL-RD/M20-215	20	215	40	10
2.5	LL-RD/M24-255	24	255	42	12
4.0	LL-RD/M30-300	30	300	57	16
6.3	LL-RD/M36-360	36	360	63	18
8.0	LL-RD/M42-425	42	425	73	20
12.5	LL-RD/M52-530	52	530	90	26

It is the most economical Lifting Loop.

It has a performance with 5 times safety factor.

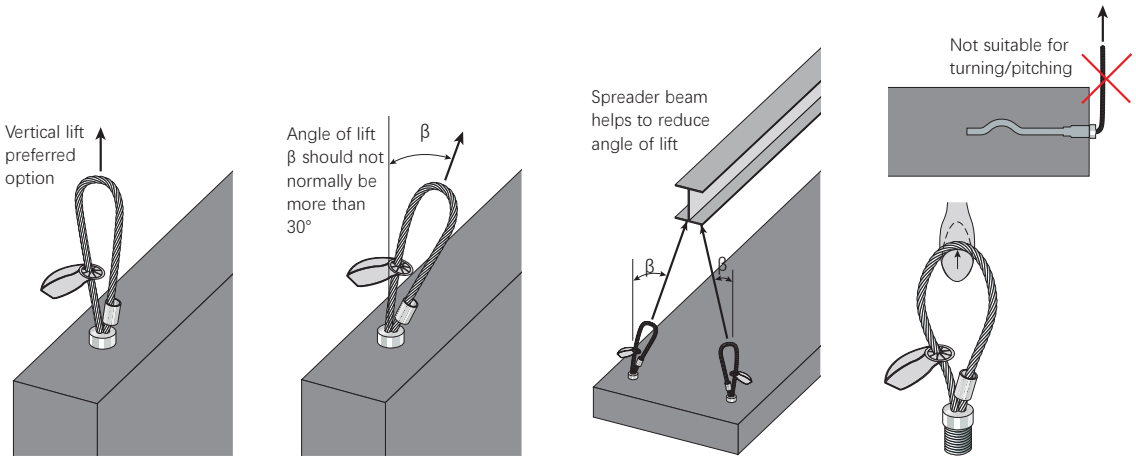
It has passed CE certification. And it is produced in an ISO 9001-certified factory.

It is suitable for almost all lifting sockets with the same thread.

They are not suitable for turning/pitching.

They may be reused subject to the inspection procedure, detailed below, but they are not recommended for severe re-use conditions.

Lifting loops should only be attached to the unit after the concrete strength has reached 15 N/mm2. In some cases, it may be economical and practical to leave the loops with the unit until final installation.



Testing/identification

All devices are proof loaded before dispatch and labeled with a unique Batch No. This number is recorded in the QA department at HULK Metal. If loops are kept reused they must be inspected every six months and retested every year.

Method of use

Before use, check that the lifting loop is compatible with the socket/insert and labeled with the unique number. Check that the wires are in good condition. Discard if bent, crushed, kinked, or if there is any loosening of the outer layer.

Discard if corroded.

Check the angle of lift shown on the unit drawings and follow the procedure shown. Do not use Threaded Lifting loops for turning/ pitching a unit. If b exceeds 45° , please consult HULK Metal. Ensure that the thread is fully bottomed out in the socket before lifting. It is permissible to back off one turn to ensure that the wire is correctly aligned for lifting.

Description

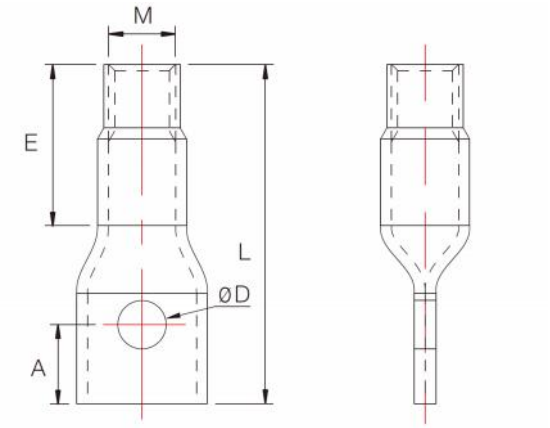
It is made by putting a high-performance steel pipe on a galvanized steel wire rope and extruding and turning thread.

It has Rd and M threads to choose from, which is compatible with both metric and Rd inserts.

It has the signs that clearly marked with their SWL.

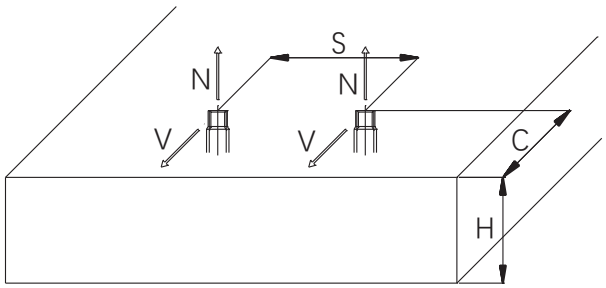
Lifting loops are suitable for use with inserts cast in flush with the face of the unit.

Flat End Fixing Socket



Flat End Fixing Socket					
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable				
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized				
SAFETY FACTOR	≥ 3				
CERTIFICATE	CE / ISO 9001				
SWL (tons)	CODE	THREAD (M)	L (mm)	D (mm)	E (mm)
0.12	FFS-M06-035	6	35	6.2	15
0.20	FFS-M08-040	8	40	8.2	15
0.35	FFS-M10-050	10	50	8.2	20
0.50	FFS-M12-060	12	60	10.2	25
0.70	FFS-M16-070	16	70	12.2	25
1.00	FFS-M16-100	16	100	12.2	45
1.25	FFS-M20-100	20	100	14.2	40
1.80	FFS-M24-120	24	120	14.2	50
2.75	FFS-M30-150	30	150	17.2	65

CODE	C_N [mm]	C_V [mm]	S [mm]	H [mm]
FFS-M06-035	55	70	105	80
FFS-M08-040	60	80	120	95
FFS-M10-050	75	100	150	85
FFS-M12-060	90	120	180	125
FFS-M16-070	105	140	210	95
FFS-M16-100	150	200	300	130
FFS-M20-100	150	200	300	125
FFS-M24-120	180	240	360	155
FFS-M30-150	225	300	450	175



Flat-end fixing sockets are not self-anchoring sockets and should be used with a maximum diameter FeE500 steel passing through the ØD hole. The total length of this steel must be at least 9 times its diameter. Flat-end Fixing Sockets are designed for fixing applications only and must not be used for lifting.

Working loads F are given for concrete with a minimum compressive strength of 25 MPa. To avoid any breakage of the concrete, it is necessary to respect distances to the minimum edges and center distances.

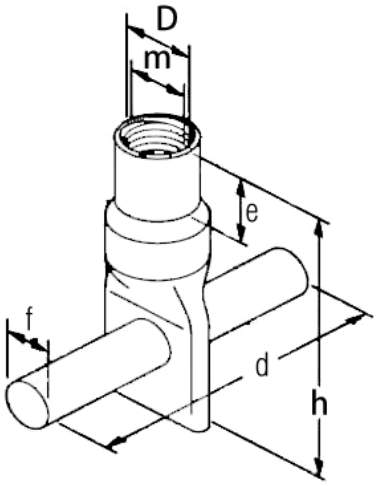
For tensile forces N, the minimum edge distance is C_N and the minimum center distance between two bushings is S. For shear forces V, the minimum edge distance is C_V and the minimum center distance between two bushes is S. The minimum thickness of the panel must be H, with a minimum concrete cover of 25 mm.

When the force applied is the result of a tensile force N combined with a shear force V, the working load F must respect the following formula:

$$\sqrt{(V^2+N^2)} \leq \text{perm. F}$$

The fixing sleeves must be used with screws with metric pitch. These must be screwed on at least once the diameter without exceeding the E value.

Flat Fixing Socket with Cross Pin



Flat Fixing Socket with Cross Pin							
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable						
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized						
SAFETY FACTOR	≥ 3						
CERTIFICATE	CE / ISO 9001						
SWL (tons)	CODE	THREAD (M)	L (mm)	d (mm)	h (mm)	e (mm)	f (mm)
0.15	FFSB-M06-035	6	35	50	35	6	6
0.20	FFSB-M08-040	8	40	50	40	8	6
0.35	FFSB-M10-050	10	50	50	50	10	6
0.50	FFSB-M12-060	12	60	50	60	12	10
0.65	FFSB-M16-070	16	70	100	70	16	10
1.00	FFSB-M16-100	16	100	100	100	16	12
1.25	FFSB-M20-100	20	100	100	100	20	13
1.80	FFSB-M24-120	24	120	100	120	24	17
2.75	FFSB-M30-150	30	150	100	150	30	22

Flat-end Fixing Sockets with Cross Pin is based on Flat-end Fixing Sockets by stamping high-performance steel rods into the holes.

The carbon steel Flat-end Fixing Sockets with Cross Pin also has excellent rust resistance after being galvanized.

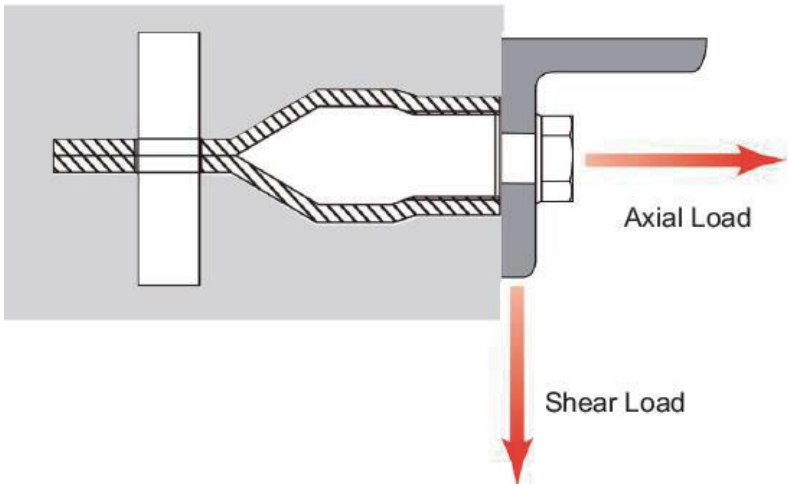
Before leaving the factory, it needs to pass the tensile test with a safety factor of more than 3 times.

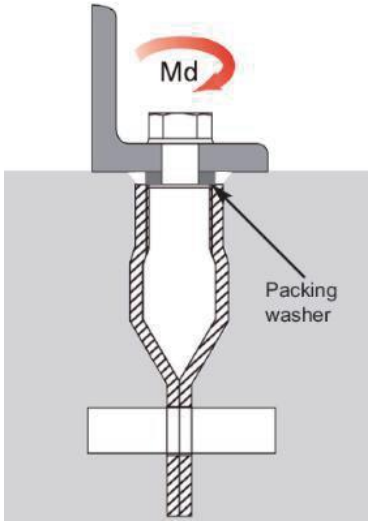
It has passed CE certification.

In addition to the properties in the parameter table, we also support OEM services.

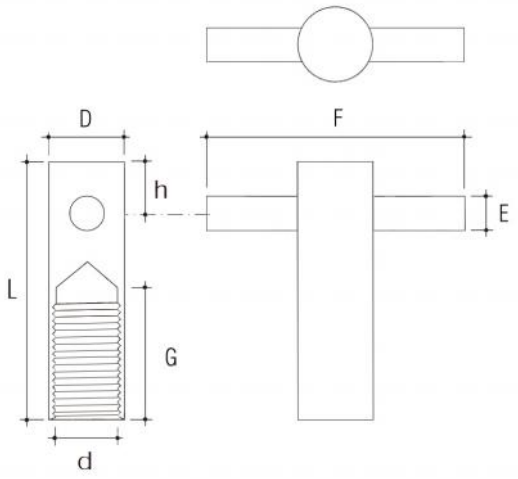
Flat-end Fixing Sockets with Cross Pin are designed for quick and easy connection of precast units with generous placement tolerances. These sockets should only be used where on-site fixing tolerances are sufficiently flexible. It incorporates a cross pin which alleviates the requirement of additional reinforcement, making it ideal for use in shallow elements.

Note: These sockets are not suitable for lifting operations.





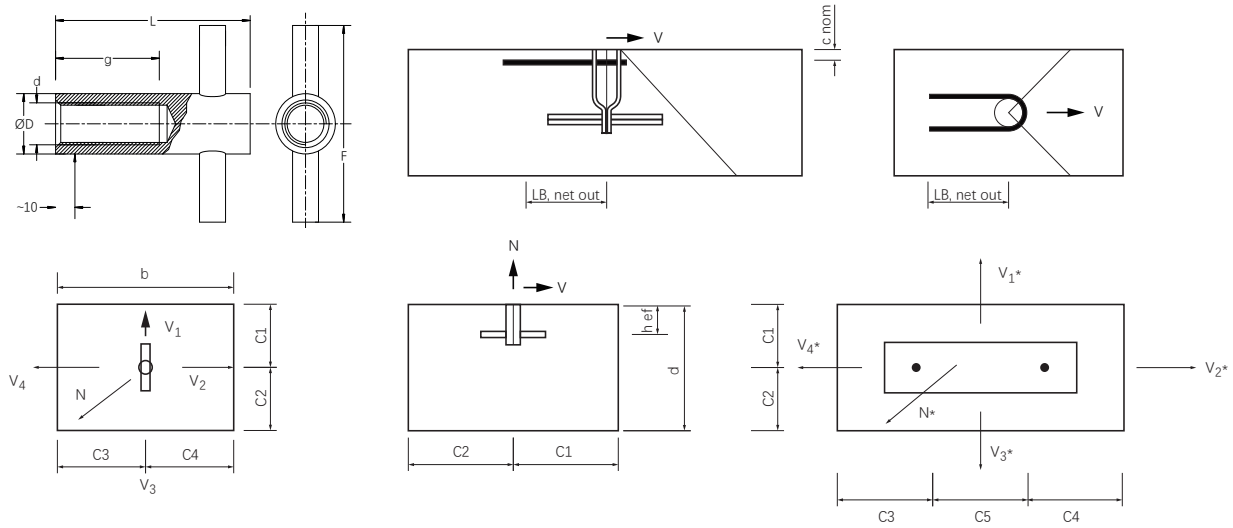
Solid Rod Fixing Socket with Cross Pin



Solid Rod Fixing Socket with Cross Pin							
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable						
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized						
SAFETY FACTOR	≥ 3						
CERTIFICATE	CE / ISO 9001						
SWL (tons)	CODE	THREAD (M)	L (mm)	D (mm)	G (mm)	E (mm)	F (mm)
0.6	FFSB-M10-050	10	50	16	25	6/8	50
0.9	FFSB-M12-050	12	50	18	20	10	75
0.9	FFSB-M12-075	12	75	18	40	10	75
1.7	FFSB-M16-075	16	75	23	40	10/12	75
2.3	FFSB-M20-075	20	75	28	35	12/14	90
3.0	FFSB-M24-100	24	100	32	55	16	100

Solid Rod Fixing Socket with Cross Pin is normally finished with a factory-fitted cross pin.
It only has M thread.
These sockets are specially designed for fixing, not suitable for lifting.
These are heavy-duty fixings machined from bar material.
Solid rod sockets are most commonly used as fixings in architectural precast units, where stainless steel is usually specified.

It can Pass CE Certification.
Solid Rod Fixing Socket with Cross Pin are the preferred option for high tensile and shear loads such as fixing cladding panels.
Allowable safe working loads are after applying a safety factor of approximately 2.5 on test data. Loads assume socket cast within the cage of reinforced concrete unit with a minimum strength of 30 N/mm.



$V2^{*} = V2$ $V4^{*} = V4$ → close edge is significant for failure

C1 = Edge distance towards the free edge where the shear force acts.
C2 = Edge distance in the direction away from the force.
C3 and C4 = Edge distances perpendicular to the shear force action.
Please note that the socket should be orientated with the pin parallel to the shear force action as shown here.

Size	er mm	ez mm
M10	75	150
M12	75	150
M12	75	150
M16	75	150
M20	75	150
M24	100	200
M30	125	250

Bars at the edge (<=100mm) wide reinforcement - (e>=100mm and ds<=10mm),

no extra rebars for axial load - insufficient edge distance

axial load and shear load at the same time; N_{rd} / N_{rd} + V_{rd} / V_{rd} <=1.2

V_{rd} * (2) = V_{rd} (2) and V_{rd} * (4) = V_{rd} * (4): for shear loads you only have to consider the fixing point close to the edge

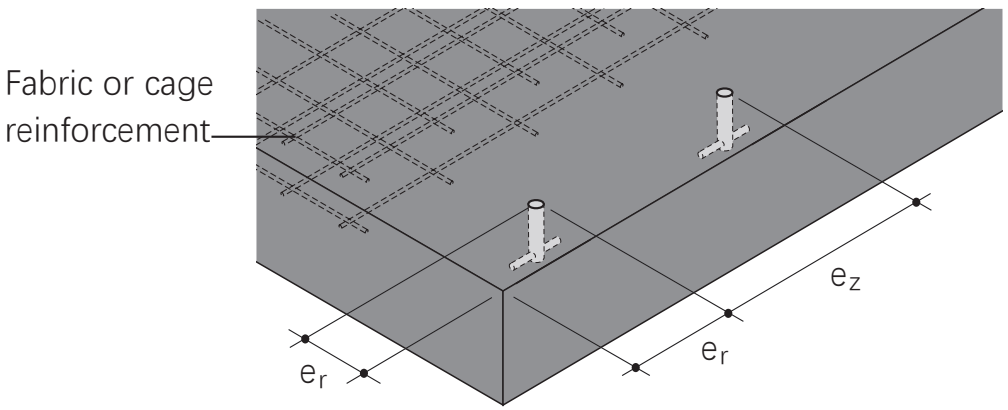
G - galvanised

S - stainless steel

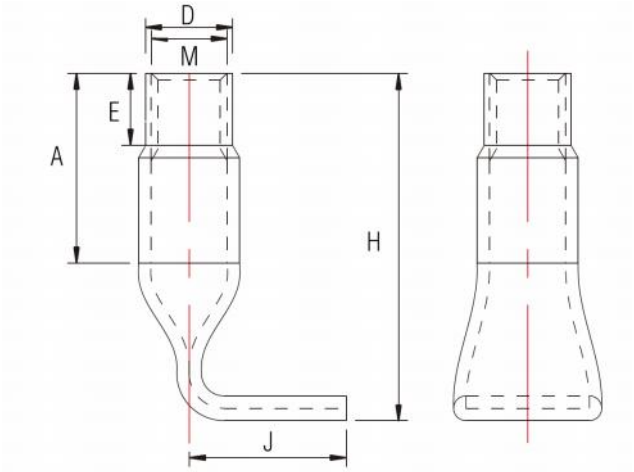
Where there is axial load and shear load at the same time, please ensure that each of the axial and shear components are less than the capacities and also that:

$$\frac{\text{Axial Component}}{\text{Axial Capacity}} + \frac{\text{Shear Component}}{\text{Shear Capacity}} \leqslant 1.2$$

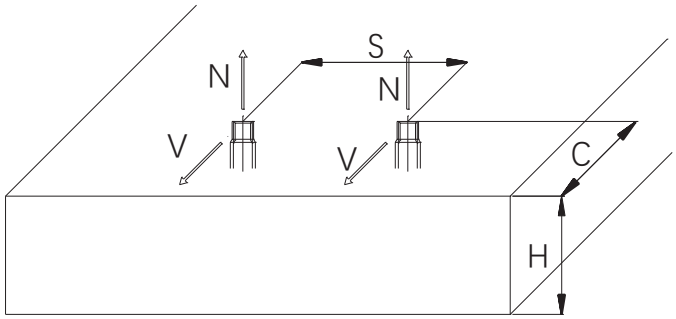
Where two or more sockets are in use, they should be spaced at a minimum of 2×C3 apart.



Fixing Socket with Bent End



Fixing Socket with Bent End							
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable						
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized						
SAFETY FACTOR	≥ 3						
CERTIFICATE	CE / ISO 9001						
SWL (tons)	CODE	THREAD (M)	H (mm)	J (mm)	D (mm)	A (mm)	E (mm)
0.20	FBS-M08-030	8	30	20	10.5	16	8
0.30	FBS-M10-060	10	60	25	13.5	23	10
0.40	FBS-M12-045	12	45	25	16	23	12
0.40	FBS-M12-070	12	70	30	16	23	12
0.30	FBS-M16-080	16	80	30	22	28	15
0.95	FBS-M16-100	16	100	35	22	28	15
1.25	FBS-M20-070	20	70	30	27	28	18
1.25	FBS-M20-100	20	100	35	27	25	18
1.45	FBS-M24-080	24	80	35	32	25	21



The 90° elbow fixing sockets are self-anchoring sockets.

These Fixing Sockets are designed for fixing applications only and must not be used for lifting.

Their material are carbon steel and stainless steel and the surface treatment are electroplating or raw color (stainless steel).

Working loads F are given for concrete with a minimum compressive strength of 25 MPa.

To avoid any breakage of the concrete, it is necessary to respect the distances to the edges and the minimum center distances.

For tensile forces N, the minimum edge distance is CN and the minimum center distance between two bushings is S. For shear forces V, the minimum edge distance is CV and the minimum center distance between two bushes is S. The minimum thickness of the panel must be H, with a minimum concrete cover of 25 mm.

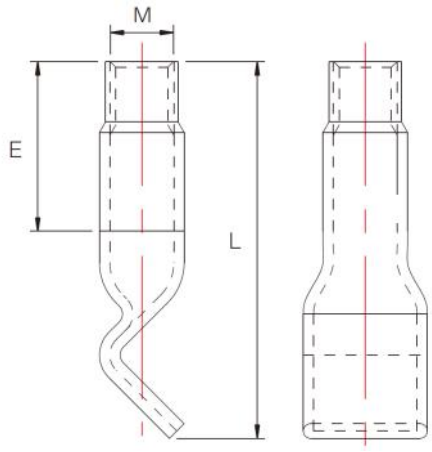
When the force applied is the result of a tensile force N combined with a shear force V, the working load F must respect the following formula:

$$\sqrt{(V^2+N^2)} \leq \text{perm. F}$$

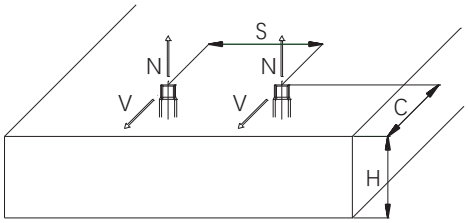
The fixing sleeves must be used with screws with metric pitch. These must be screwed on at least once the diameter without exceeding the E value.

CODE	C_N [mm]	C_V [mm]	S [mm]	H [mm]
FBS-M10-060	90	120	180	85
FBS-M12-045	70	90	135	70
FBS-M12-070	105	140	210	95
FBS-M16-060	90	120	180	85
FBS-M16-100	150	200	300	125
FBS-M20-070	105	140	210	95
FBS-M20-100	150	200	300	125

Fixing Socket With Wavy End



Fixing Socket With Wavy End				
MATERIAL	Stainless Steel / Q345 / Q235 / 20# / Customizable			
SURFACE TREATMENT	Raw Color, Electro-galvanized, Hot-dip Galvanized			
SAFETY FACTOR	≥ 3			
CERTIFICATE	CE / ISO 9001			
SWL (tons)	CODE	THREAD (M)	L (mm)	E (mm)
0.08	FWS-M06-030	6	30	10
0.15	FWS-M06-050	6	50	30
0.20	FWS-M08-040	8	40	15
0.25	FWS-M08-050	8	50	20
0.30	FWS-M10-040	10	40	15
0.35	FWS-M10-050	10	50	20
0.50	FWS-M12-060	12	60	25
1.00	FWS-M16-100	16	100	45
1.25	FWS-M20-100	20	100	65



The fixing sockets with wavy end are made by extruding, bending, shrinking, and other processes.
The wavy fixing sockets serve as self-anchoring sockets.
Fixing sockets should only be used for fixing applications and not for lifting purposes.
The working loads F provided apply to concrete with a minimum compressive strength of 25 MPa.
It will go through a tensile test with a safety factor of more than 3 times before leaving the factory.
To prevent any concrete breakage, it is important to adhere to the specified distances from the edges and the minimum center distances.
For tensile forces N, the minimum distance from the edge is CN, and the minimum center distance between two sockets is S.
For shear forces V, the minimum distance from the edge is CV, and the minimum center distance between two sockets is also S.
The panel must have a minimum thickness of H and a minimum concrete cover of 25 mm.

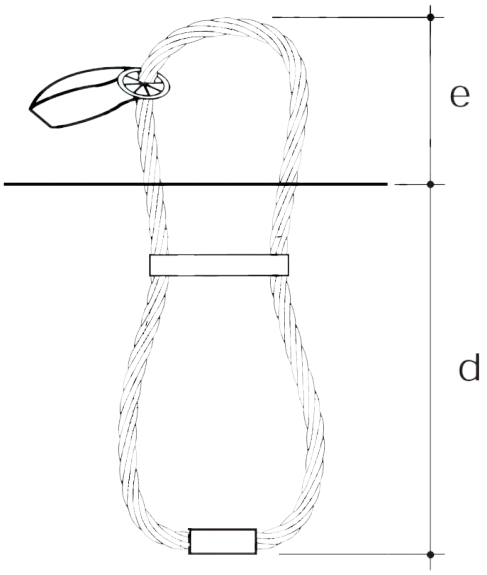
When the applied force is a combination of tensile force N and shear force V, the working load F must comply with the following formula:

$$\sqrt{(V^2+N^2)} \leq \text{perm. } F$$

The fixing sockets must be used with screws with metric pitch. These must be screwed on at least once the diameter without exceeding the E value.

CODE	C_N [mm]	C_V [mm]	S [mm]	H [mm]
FWS-M06-030	45	60	90	55
FWS-M06-050	75	100	150	75
FWS-M08-040	60	80	120	65
FWS-M08-050	75	100	150	75
FWS-M10-040	60	80	120	65
FWS-M10-050	75	100	150	75
FWS-M12-060	90	120	180	85
FWS-M16-100	150	200	300	125
FWS-M20-100	150	200	300	125

Cast in Loop



Cast in Loop				
MATERIAL	Alloy Steel / Carbon Steel / Aluminum Alloy / Customizable			
SURFACE TREATMENT	Electro-galvanized			
SAFETY FACTOR	≥ 3			
CERTIFICATE	CE / ISO 9001			
SWL (tons)	CODE	E (mm)	D (mm)	Rd (mm)
0.8	HM-CL008	60	150	6
1.2	HM-CL012	65	160	7
1.6	HM-CL016	70	165	8
2.0	HM-CL020	80	200	9
2.5	HM-CL025	85	230	10
4.0	HM-CL040	100	240	12
5.2	HM-CL052	100	260	14
6.3	HM-CL063	110	280	16

SWL (tons)	CODE	E (mm)	D (mm)	Rd (mm)
8.0	HM-CL080	120	320	18
10.0	HM-CL100	135	390	20
12.5	HM-CL125	150	420	22
16.0	HM-CL160	165	450	24
20.0	HM-CL200	180	550	28
25.0	HM-CL250	200	600	32

Introduction:

Cast-in lifting loops are the most cost-effective way to attach a crane hook to precast units. However, they do require significant edge distances. Additionally, it is important to consider the visibility of steel rope hoops after panel assembly. If necessary, protruding hoops can be cut off, but it is still important to protect the cut ends from corrosion to prevent rust staining.

Using cast-in lifting loops is the safest method due to its flexibility. Hoops made from reinforcement bars are more prone to fatigue, especially if they are bent during angled lifts.

In reinforced concrete, if the hoops are installed according to the minimum dimensions in the table, no additional anchorage reinforcement is usually needed. However, for acute-angled lifts, it may be necessary to provide additional lateral reinforcement.

Description:

Cast-in lifting hoops are manufactured from bright or galvanized mild steel rope. They have a swaged connecting ferrule and a tag that clearly identifies the SWL of the loop. The tag is designed not to slide down the hoop during casting and should therefore remain visible.

Cast-in lifting loops are suitable for use through a single cycle from production to final installation but are not suitable for multi-use applications.

Selection:

Ensure the correct size is chosen for any lift. Consider the lift angle, crane factor, and adhesion to the formwork.

Installation:

Install loops in the direction of the anticipated load, with the ferrule directly opposite the pulling direction. Suspend them from supports attached to the formwork, allowing 2/3 of the hoop to be embedded and 1/3 exposed.

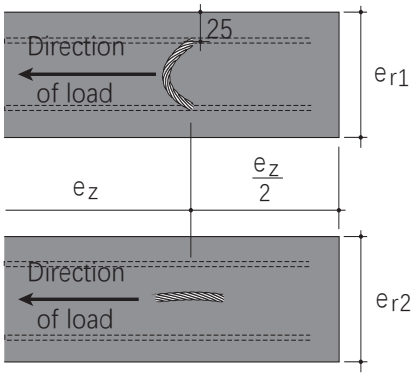
Secure the hoop to the cage carefully to prevent movement during concreting. Fasten it through the shuttering, ensuring the wire is tightly sealed to the shuttering.

Storage:

When storing concrete units, take precautions to prevent steel rope hoops from bending. Inspect the hoops for damage as described in the Method of Use section below.

Crane Linkage:

Exposed hoops can be connected to standard crane hooks, provided that the curvature radius of the crane hook is at least equal to the rope diameter.

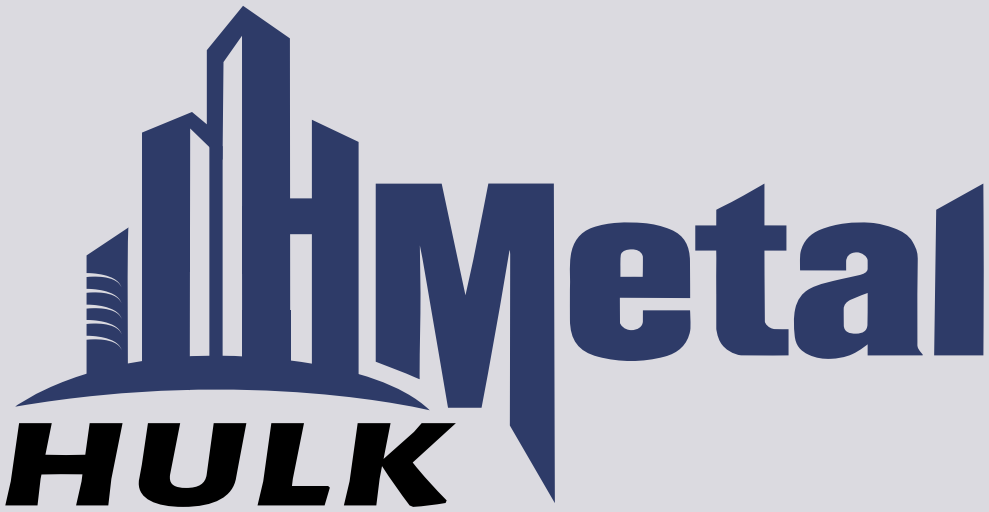


Reinforcement cage essential

Method of Use:

Before casting or lifting, ensure that the hoop is in good condition. Discard a hoop if any wires are broken, crushed, unraveled, or if there are kinks. Additionally, do not use it if excessive corrosion is present. Any cast-in hoop displaying damage should not be utilized.

SWL [t]	Minimum Spacings			Color Code
	e_z [mm]	e_{r1} [mm]	e_{r2} [mm]	
0.8	540	140	80	White
1.2	620	150	100	Red
1.6	690	170	120	Purple
2.0	830	180	140	Light green
2.5	890	190	160	Charcoal
4.0	1000	220	200	Dark green
5.2	1030	300	240	Orange
6.3	1150	320	280	Blue
8.0	1290	410	300	Light grey
10.0	1460	440	320	Pink
12.5	1620	570	360	Yellow
16.0	1860	630	420	Lilac
20.0	2120	680	450	Ochre
25.0	2410	760	500	Brown



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