

## Cast-in sockets

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Cast-in sockets are a means of attaching items to precast concrete. They are a cheaper alternative to cast-in channel, but do not offer the flexibility or tolerance of channel.

There are two main types of sockets available

**solid rod socket**– as the name implies, these begin as a solid rod. This is then drilled and a thread is tapped in the hole. These were developed by a Company called Harris & Edgar many years ago, but are now manufactured by many other Companies. The thread is a metric thread. Typically sizes range from M10 up to M30. The tensile capacity of an M30 socket is 60 kN. Shear capacities are generally 50% of tensile capacity. All sizes except the M30 have an integral crosspin as shown. This size has a short length of reinforcing bar inserted by the precaster. Typical dimensions and capacities are shown below.



Although most manufacturers' information does not specify a need for local reinforcement, it is good practice to incorporate suitable reinforcement, particularly if the loads are near, or towards an edge of the concrete.

**Tube socket** – this is a tube into which a thread is cut. The lower end of the tube may be treated in several ways as shown below.



The sockets shown have hole for crosspin, crimped end, crimped end with nailing plate, angular end.

Generally the tube type of socket does not have the capacity of the solid rod. For example the tensile capacity of an M30 socket with crosspin is only 27.5 kN, less than half of that of the solid rod. It is important therefore that substitutions are not made if a design calls for solid rod sockets. Capacities also vary between the different types and according to the length of the socket. For instance an M16 x 100 crimped end socket has a capacity of 10 kN, an M16 x 100 angular socket has a capacity of 13 kN, but an M16 x 60 angular socket has a capacity of only 8 kN. Again, it is vital that the correct type of socket is used as per the design/specification.

Sockets of both types are available in both stainless and non-stainless steel, although some manufacturers may not have their whole range available in stainless steel.

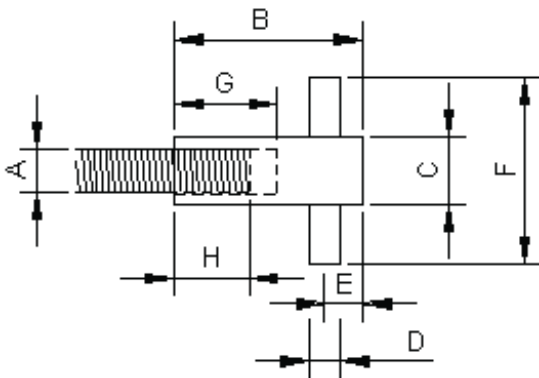
It is important that fixing sockets are not used for lifting purposes. During lifting, the effective loads due to rope angle and dynamic factors are usually considerably higher than the normal load factors of 1.4 or 1.6 used for static loads. As a safeguard in this aspect, lifting sockets and the lifting heads screwed into them have a rounded thread profile called 'Rd'. These will not screw into a standard metric 'M' thread such as is found in fixing sockets.

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Sockets are also available in injection-moulded polyamide (Nylon). Generally the capacities of these are lower than steel sockets.

**Typical dimensions and capacities of solid rod sockets**



Dia/length		12/75	16/75	16/100	20/75	20/100	24/100	30/125
Thread size (mm)	(A)	12	16	16	20	20	24	30
Overall length (mm)	(B)	75	75	100	75	100	100	125
Overall diameter (mm)	(C)	20	22	22	26	26	35	50
Cross pin diameter (mm)	(D)	10	10	10	12	12	16	* 20
Cross pin position (mm)	(E)	12	15	15	16	16	20	37
Cross pin length (mm)	(F)	75	75	75	88	88	100	* 450
Thread depth (mm)	(G)	40	40	65	38	63	55	60
Minimum thread embedment (mm)	(H)	14	19	19	24	24	28	35
Minimum edge distance (mm)		75	75	100	75	100	100	125
Minimum spacing (mm)		150	150	200	150	200	200	250
Recommended torque (Nm)		32	81	81	138	138	216	540
Maximum working tensile force (kN)		9.0	16.9	16.9	23.0	23.0	30.0	60.0
Maximum working shear force (kN)		5.7	10.8	10.8	17.0	17.0	23.8	
Hairpin type/diameter		H8	H8	H8	H10	H10	H12	N/A

The above figures are for guidance only. The manufacturer's figures should be used in actual designs.

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**Typical capacities for different types of tube sockets**



Dia	12	12	16	16	16	16	20	24	30
Length	60	70	70	80	100	120	100	120	150
Capacity	5.0 kN	6.0 kN	7.0 kN	8.0 kN	10.0 kN	12.0 kN	12.5 kN	18.0 kN	27.5 kN



Dia	12	12	16	20	24
Length	50	70	100	100	100
Capacity	4.0 kN	6.0 kN	10.0 kN	12.5 kN	16.0 kN



Dia	12	16	20
Length	70	100	100
Capacity	6.0 kN	10.0 kN	12.5 kN



Dia	12	12	16	16	20	20	24
Length	45	70	60	100	70	100	80
Capacity	4.0 kN	8.0 kN	8.0 kN	13.0 kN	12.0 kN	16.0 kN	16.0 kN

These figures are indicative only and are all taken from a single manufacturer. The figures published by different manufacturers for similar socket types do vary slightly, and substitutions should be used with caution.