

H Rod Hanger Rods



FREYSSINET
SUSTAINABLE TECHNOLOGY

- High-performance hinge anchor
- Simple connection to the structure
- Quick installation

Architectural hanger rod

Technical data sheet reference no.: FT En C II 4 3

An architectural anchor

A fork is a simple, efficient and elegant way to anchor a structural rod to a structure. A metal plate with a hole is sufficient, making the need for sophisticated connections unnecessary.

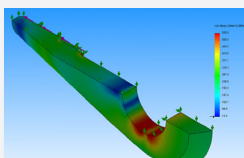
For all the rod diameters and grades mentioned below, Freyssinet offers a range of aesthetic and functional forks that provide all the required qualities in terms of strength and durability.



Advantages

H Rod hanger rods offer numerous advantages:

- **Simplicity:** during installation (prefabricated hangers can be delivered directly to site) and maintenance,
- **Durability:** steel hangers are galvanised or plated; the SS460 range is made from high quality stainless steel,
- **Aesthetics:** the same design regardless of the forces involved,
- **Angular Correction:** fork design allows for 10 mrad of misalignment (i.e. 0.5°), which is usually enough to compensate for potential structural inaccuracies,
- **Adjustment:** adjustment range is equal to the diameter of the rod, making visual inspection quick and simple,
- **Tension:** tension and direct tension of rods can be controlled,
- **Strength:** range components modelled using finite element studies,



- **Endurance:** the system has successfully withstood two million fatigue test cycles at an amplitude of 110 MPa and 55% of rod GUTS.

Three hanger ranges

Three hanger ranges are available depending on project requirements:

- **The H Rod SS460** is based on the use of stainless steel rods with a yield strength of 460 MPa.
- **The H Rod S520** is based on the use of carbon steel rods with a yield strength of 520 MPa.
- **H Rod+** is based on the use of carbon steel Freyssibar+ HSA rods with a yield strength of 870 MPa, largely surpassing other rods available on the market while ensuring optimum fatigue resistance. This rod optimises the design of the structure by reducing the number of hangers or the diameter of the rods.

Main rod specifications

The tables below give the mechanical properties of the three hanger ranges and the rod lengths available.

	Units							
Thread	M30	M33	M36	M39	M42	M45	M48	M52
Pitch (mm)	3.5	3.5	4	4	4.5	4.5	5	5
Stress area (mm ²)	560	693	816	975	1,120	1,306	1,473	1,757
Mass per unit length (kg/m)	4.70	5.78	6.82	8.08	9.34	10.83	12.26	14.56
H Rod SS460								
Load at elastic limit (kN)	258	319	375	449	515	601	678	808
Ultimate strength (kN)	364	450	530	634	728	849	957	1 142
Elongation at break (%)	15							
Young's Modulus (MPa)	200,000							
H Rod S520								
Load at elastic limit (kN)	291	360	424	507	582	679	766	914
Ultimate strength (kN)	392	485	571	683	784	914	1,031	1,230
Elongation at break (%)	15							
Young's Modulus (MPa)	200,000							
H Rod+								
Load at elastic limit (kN)	487	603	710	848	974	1,136	1,282	1,529
Ultimate strength (kN)	599	742	873	1,043	1,198	1,397	1,576	1,880
Elongation at break (%)	12							
Young's Modulus (MPa)	200,000							

Available rod lengths

Thread	Units							
	M30	M33	M36	M39	M42	M45	M48	M52
H Rod S520	Up to 13 m as standard – 18 m on request							
H Rod SS460	6 m as standard – up to 9 m on request							
H Rod+	14.8 m max.							

Please contact us regarding diameters not listed above.

Couplers and turnbuckles corresponding to the rods described above enable the use of H Rod hangers for hanger lengths that exceed the maximum unit lengths of the rods.

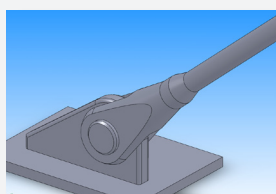
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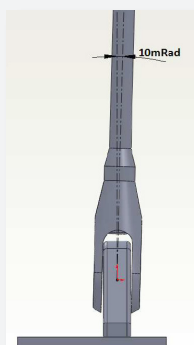
Installation

H Rod hangers can be delivered to site preassembled or ready for assembly, depending on the required length. The minimum effective thread engagement, clearly marked on the threaded ends of the rod, must be checked at the time of delivery and prior to installation, even if the fork or nut is already screwed onto the rod.



The length of the hangers must also be checked prior to installation. It may be adjusted in situ by means of a turnbuckle (optional) if the length of the hanger allows.

If forks are used, the pin must be inserted into the fork and the gusset on the structure without impact so that it is not subjected to bending strain when the hanger is put under load. H Rod hangers and forks are designed to accept 10 mrad of misalignment, thereby overcoming common construction faults.



It should be noted that for SS460 range hangers, an isolation bearing may be inserted into the steel gusset on the structure to prevent the effects of galvanic coupling with the stainless steel pin.

The various accessories must be tightened in accordance with the sequences and methods specified by Freyssinet. Once installation is complete, the hangers can be tensioned by straightening the deck or applying pre-tension (defined by the structure designer) using hydraulic jacks and a turnbuckle.

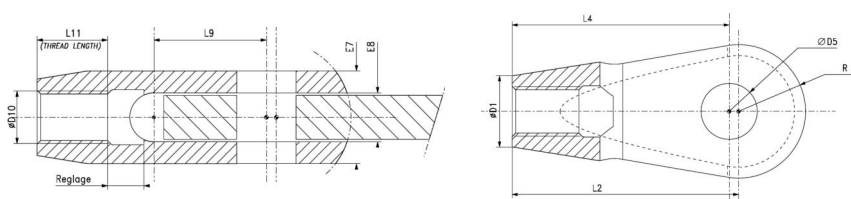
References

Ghazipur (2011) – India – hangers with made-to-measure forks – M36 units – H Rod SS460 range

Puente sobre el Rio Saja (2011) – Spain – hangers without forks – M75 units – H Rod+ range

Décines (2012) – France – hangers with forks – M48 units – H Rod S520 range

Dimensions



H Rod S520 & SS460 range - Forks (dimensions in mm)

Type	D1	L2	R3	L4	D5	E7	E8	L9	D10	L11	Adjust.
M30	43	141	43	135	34	51	28	65.5	M30x3.5	42	30
M33	48	154	48	149	39	57	30.5	71.5	M33x3.5	45	33
M36	52	168	54	161	42	64	35	78	M36x4	50	36
M39	57	182	54	174	45	68	36.5	85.5	M39x4	53	39
M42	61	194	57	186	48	74	39	91	M42x4.5	57	42
M45	65	208	63	199	51	78	40	94	M45x4.5	60	45
M48	70	220	66	211	54	87	45	102	M48x5	66	48
M52	76	235	71	225	58	95	49	110	M52x5	69	50

H Rod+ range - Forks (dimensions in mm)

Type	D1	L2	R3	L4	D5	E7	E8	L9	D10	L11	Adjust.
M30	76	147	47	140	42	65	42	74.5	M30x3.5	39	30
M33	48	158	51	153	45	71	45	73	M33x3.5	42	33
M36	52	170	56	166	50	77	48	86	M36x4	45	36
M39	57	188	59	180	55	82	51	97	M39x4	48	39
M42	61	203	63	195	58	89	54	106	M42x4.5	55	42
M45	65	217	66	209	61	94	56	113.5	M45x4.5	59	45
M48	70	227	71	218	65	102	60	117.5	M48x5	60	48
M52	76	249	76	237	70	108	62	130	M52x5	63	50

Gussets are made of at least S355 grade steel as per Eurocode 3.



Production and distribution

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