

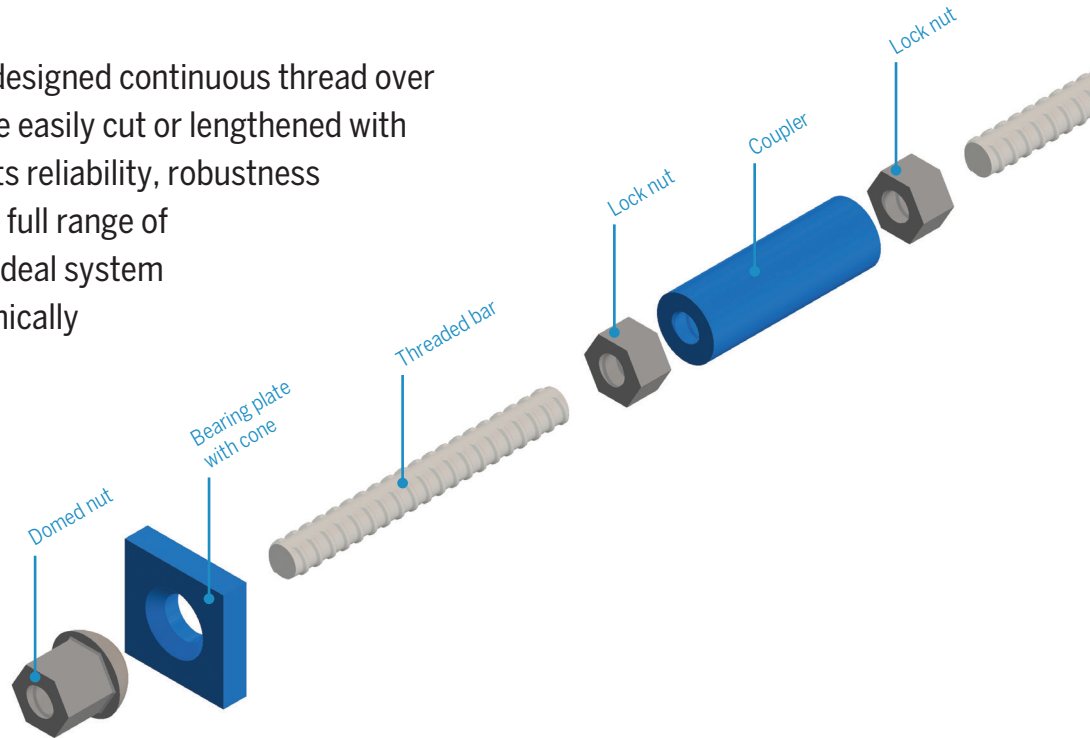
# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



The BBR H Bar is a steel threaded bar with superior fatigue performance and the widest range of bar diameters on the international market place. It is available with steel grades ranging from 500/550MPa to 930/1080MPa (yield/ultimate) and in diameters from 20mm to 75mm.

The BBR H Bar has a specially designed continuous thread over its entire length allowing it to be easily cut or lengthened with couplers at any location. With its reliability, robustness and ease of installation and the full range of accessories - BBR H Bar is the ideal system for the most complex and technically challenging applications.



Yusufeli Dam (Turkey)

# BBR H Bar System

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## Testing & quality assurance to international standards

At BBR, we take pride in every piece of construction technology that we supply and this is why we conduct thorough independently verified laboratory testing. We expect that each product should conform to the highest standards and that it should reach our customers in prime condition, ready for immediate use.

### Independently verified testing

As a part of our testing program for technical approval, we have performed key tests to verify the major mechanical properties of the BBR H Bar System. We have carried out static, fatigue and material testing on the system, comprising the accessories. All the tests were executed in independent accredited European laboratories.

The testing results proved that the BBR H Bar System not only complies with the latest European norms, standards and guidelines, but also fulfills additional requirements specified by local authorities in other regions.

### Static test on tensile bar element

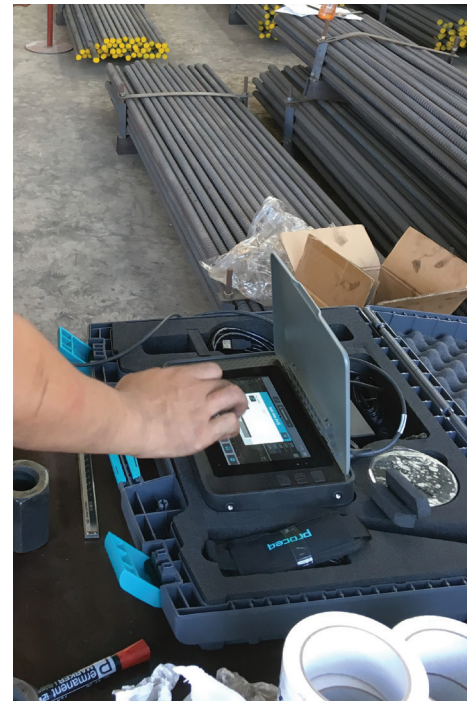
Static testing of tensile elements is carried out according to European norms and international standards.

A bar specimen is stressed by standard stressing equipment to the maximum force (corresponding to ultimate tensile strength) at a specified loading rate. Elongation of the bars is measured during the tests.

The maximum force and force at yield must meet the specified values as 5% fractiles. The ratio of maximum force to force at yield, as well as the elongation at maximum force (Agt) must meet values as 10% fractiles. Agt is expected to be at least 3.5%.

### Static test on bar system

Static testing of the whole system complies with European technical approval guidelines. A complete bar system kit consists of bar, anchor plate, nut and coupler. The assembled system is stressed in stages using standard stressing equipment to 80% of characteristic ultimate tensile stress. The load is then maintained for one hour for the bonded system, or two hours for the unbonded system. The deformation during loading is measured. Additionally, any slip at the anchorage and coupler, as well as any residual deformation of anchorage components after stressing is monitored. All type of nuts and couplers are tested. In each test, 100% of the specified maximum force is attained, with deformation stabilizing at 80% of ultimate tensile stress within 30 minutes.



### Fatigue test on tensile bar element

Fatigue testing of the bars is executed under the provisions of European norms and international standards. A bar specimen is stressed by a resonance testing rig to a specified force range with stress variation cycles. All the bars withstood two million load cycles, with an upper limit at 70% of characteristic ultimate tensile stress and a specified stress range without failure.

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## Fatigue test on bar system

Fatigue testing of the system follows European technical approval guidelines. A complete bar system kit – consisting of bar, anchor plate, nut and coupler – is stressed by a resonance testing rig to a specified force range with stress variation cycles. All types of nuts and couplers are also tested, and any slip at the anchorage and coupler is measured. The acceptance criterion is to pass two million load cycles, with an upper force at 65% of characteristic ultimate tensile stress and a stress range of not less than 80MPa.

## Verification of load transfer in the anchorage zone

The load transfer in the anchorage zone, including relevant reinforcement and concrete with the recommended dimensions for a particular concrete strength, should be verified according to the European and international codes and technical approval guidelines. During a load transfer test, the anchorage components are subjected to 10 load cycles between 12% and 80% of characteristic ultimate tensile stress, before the complete assembly is loaded to failure. An efficiency of at least 110% of characteristic ultimate tensile stress must be achieved.

## Packing & shipping

Our products are shipped globally to various projects, therefore proper packing is a critical step in ensuring products are delivered undamaged. This is especially important when it concerns products which feature additional corrosion protection – such as galvanizing or epoxy coating.

The highest standards are applied to the BBR packing regime, ensuring goods are wrapped with protective paper or fabric, properly bound with steel strapping and placed inside wooden crates.

## Additional testing on request

BBR has a long experience of working with international standards and laboratory test regimes, thus our engineers are able to perform any project-specific tests that may be required. For example, static and fatigue testing conforming with EN ISO 15630-1 and also with ETAG 013 are available. Please contact us for further details.



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# BBR H Bar System

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## BBR H930 Bar System

Threaded Bar Specifications

Property	Size	Component dimensions				
		ø25	ø32	ø36	ø40	ø50
Nominal diameter	mm	25	32	36	40	50
Yield stress	MPa	930	930	930	930	930
Ultimate stress	MPa	1080	1080	1080	1080	1080
Yield load	kN	457	748	947	1169	1827
Ultimate load	kN	530	869	1099	1357	2121
Nom. cross section	mm <sup>2</sup>	491	804	1018	1257	1964
Weight	kg/m	4.10	6.65	8.41	10.34	16.28

Right-hand thread

Elongation at max. load  $A_{gt} = 3.5\%$

## BBR H830 Bar System

Threaded Bar Specifications

Property	Size	Component dimensions			
		ø25	ø32	ø36	ø40
Nominal diameter	mm	25	32	36	40
Yield stress	MPa	830	830	830	830
Ultimate stress	MPa	1030	1030	1030	1030
Yield load	kN	407	667	844	1043
Ultimate load	kN	505	828	1048	1294
Nom. cross section	mm <sup>2</sup>	491	804	1018	1257
Weight	kg/m	4.10	6.65	8.41	10.34

Elongation at max. load  $A_{gt} = 3.5\%$

Accessory Specifications

Anchor nut	Size	Component dimensions				
		ø25	ø32	ø36	ø40	ø50
SW	mm	50	60	65	70	80
L	mm	60	72	80	100	110
Weight	kg	0.7	1.2	1.5	2.0	2.7

Accessory Specifications

Anchor nut	Size	Component dimensions			
		ø25	ø32	ø36	ø40
SW	mm	50	60	65	70
L	mm	60	72	80	100
Weight	kg	0.7	1.2	1.5	2.0

Domed nut		Component dimensions				
SW	mm	50	60	65	70	85
L	mm	75	90	100	115	145
D	mm	72	80	90	100	120
Weight	kg	1.1	1.8	2.3	3.1	5.4

Domed nut		Component dimensions			
SW	mm	50	60	65	70
L	mm	75	90	100	115
D	mm	72	80	90	100
Weight	kg	1.1	1.8	2.3	3.1

Spherical nut		Component dimensions				
SW	mm	50	60	65	70	80
L	mm	60	72	80	100	110
Weight	kg	0.6	1.2	1.4	2.0	2.7

Spherical nut		Component dimensions			
SW	mm	50	60	65	70
L	mm	60	72	80	100
Weight	kg	0.6	1.2	1.4	2.0

Coupler		Component dimensions				
D	mm	50	60	70	75	90
L	mm	132	168	180	220	270
Weight	kg	1.4	2.5	3.6	5.1	8.9

Coupler		Component dimensions			
D	mm	50	60	70	75
L	mm	132	168	180	220
Weight	kg	1.4	2.5	3.6	5.1

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H930 Bar System

Accessory Specifications

Property	Size	Component dimensions				
		ø25	ø32	ø36	ø40	ø50
<b>Bearing plate for anchor nut</b>						
L	mm	115	150	165	185	225
E	mm	30	40	45	50	65
Weight	kg	2.9	6.6	8.9	12.5	24.1

Property	Size	Component dimensions				
		ø25	ø32	ø36	ø40	ø50
<b>Bearing plate for domed nut</b>						
L	mm	115	150	165	185	225
E	mm	30	40	45	50	65
D	mm	35	45	50	55	65
Weight	kg	2.7	6.3	8.5	11.9	23.5

Property	Size	Component dimensions				
		ø25	ø32	ø36	ø40	ø50
<b>Bearing plate for spherical nut</b>						
L	mm	115	150	165	185	225
E	mm	30	40	45	50	65
D	mm	35	45	50	55	65
Weight	kg	2.8	6.4	8.8	12.3	23.9

## BBR H830 Bar System

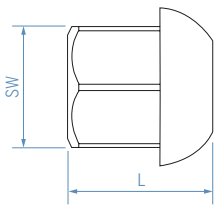
Accessory Specifications

Property	Size	Component dimensions			
		ø25	ø32	ø36	ø40
<b>Bearing plate for anchor nut</b>					
L	mm	100	150	155	170
E	mm	25	40	40	45
Weight	kg	1.8	6.6	6.9	9.4

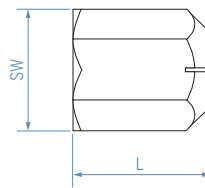
Property	Size	Component dimensions			
		ø25	ø32	ø36	ø40
<b>Bearing plate for domed nut</b>					
L	mm	100	150	155	170
E	mm	25	40	40	45
D	mm	35	45	50	55
Weight	kg	1.6	6.3	6.6	8.9

Property	Size	Component dimensions			
		ø25	ø32	ø36	ø40
<b>Bearing plate for spherical nut</b>					
L	mm	100	150	155	170
E	mm	25	40	40	45
D	mm	35	45	50	55
Weight	kg	1.7	6.4	6.8	9.2

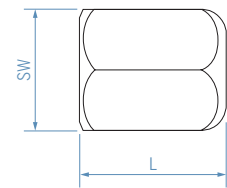
## Steel Accessoires



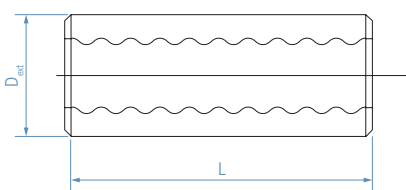
Domed anchor nut



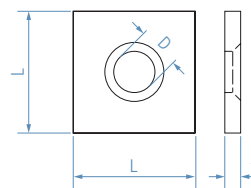
Spherical anchor nut



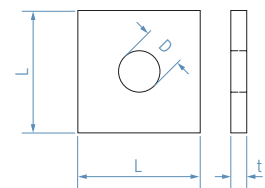
Hex anchor nut



Coupler



Bearing plate with cone



Bearing plate

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H670 Bar System

Threaded Bar Specifications

Property	Size	Component dimensions									
		ø22	ø25	ø28	ø30	ø35	ø43	ø50	ø57.5	ø63.5	ø75
Nominal diameter	mm	22	25	28	30	35	43	50	57.5	63.5	75
Yield stress	MPa	670	670	670	670	670	670	670	670	670	670
Ultimate stress	MPa	800	800	800	800	800	800	800	800	800	800
Yield load	kN	255	329	413	474	645	973	1315	1740	2122	2960
Ultimate load	kN	304	393	493	566	770	1162	1571	2078	2534	3535
Nom. cross section	mm <sup>2</sup>	380	491	616	707	962	1466	1960	2597	3167	4418
Weight	kg/m	2.98	3.85	4.83	5.54	7.55	11.40	15.41	20.38	24.86	34.68

Right-hand thread

Elongation at max. load  $A_{gt} = 5\%$

Accessory Specifications

Property	Size	Component dimensions									
		ø22	ø25	ø28	ø30	ø35	ø43	ø50	ø57.5	ø63.5	ø75
<b>Anchor nut</b>											
SW	mm	41	46	50	55	65	80	80	90	100	100
L	mm	50	55	60	65	70	90	100	120	110	130
Weight	kg	0.39	0.53	0.67	0.90	1.37	2.62	2.80	4.42	4.41	4.90

<b>Domed nut</b>											
SW	mm	36	41	46	50	60	70	80	90	100	120
D	mm	45	50	55	60	70	85	100	115	125	150
L	mm	53	60	67	71	83	102	116	137	151	174
Weight	kg	0.31	0.43	0.60	0.79	1.30	2.20	3.59	5.50	7.30	11.90

<b>Lock nut</b>											
SW	mm	36	41	46	50	55	70	80	90	100	100
L	mm	22	22	30	30	40	50	50	60	70	80
Weight	kg	0.12	0.15	0.26	0.31	0.47	1.00	1.39	1.93	3.03	2.33

<b>Coupler</b>											
D	mm	40	45	50	55	65	80	90	102	114	108
L	mm	110	120	140	150	170	200	210	250	300	260
Weight	kg	0.71	0.94	1.36	1.84	2.95	5.42	7.24	10.31	14.48	8.74

<b>Bearing plate for anchor nut</b>											
L	mm	80	90	100	110	125	150	175	200	220	260
E	mm	20	20	20	25	25	30	30	45	50	65
Weight	kg	2.26	2.20	2.90	3.74	5.80	11.40	17.03	25.46	31.05	53.10

<b>Bearing plate for domed nut</b>											
L	mm	110	125	135	145	170	210	240	275	300	325
E	mm	30	30	35	35	40	50	55	60	65	70
Weight	kg	2.62	3.39	4.59	5.32	8.36	15.96	22.77	32.77	42.00	52.44

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H500 Bar System

Threaded Bar Specifications

Property	Size	Component dimensions									
		ø20	ø25	ø28	ø32	ø40	ø43	ø50	ø57.5	ø63.5	ø75
Nominal diameter	mm	20	25	28	32	40	43	50	57.7	63.5	75
Yield stress	MPa	500	500	500	500	500	500	500	555	555	500
Ultimate stress	MPa	550	550	550	550	550	550	550	700	700	550
Yield load	kN	157	246	308	402	629	726	982	1441	1758	2209
Ultimate load	kN	172	270	339	442	691	799	1078	1818	2217	2430
Nom. cross section	mm <sup>2</sup>	314	491	616	804	1257	1466	1964	2597	3167	4418
Weight	kg/m	2.47	3.85	4.83	6.31	9.87	11.40	15.41	20.38	24.86	34.68

Left-hand thread

Elongation at max. load  $A_{gt} = 6\% \leq \phi 32\text{mm}$

Elongation at max. load  $A_{gt} = 5\% \phi 40$  to 75mm

Accessory Specifications

Property	Size	Component dimensions									
		ø20	ø25	ø28	ø32	ø40	ø43	ø50	ø57.5	ø63.5	ø75
<b>Anchor nut</b>											
SW	mm	36	41	46	55	65	70	80	90	100	110
L	mm	45	50	55	60	70	85	85	100	135	120
Weight	kg	0.26	0.34	0.48	0.78	1.19	1.86	2.17	3.65	6.60	7.02

<b>Domed nut</b>											
SW	mm	36	41	41	46	60	70	80	90	100	120
L	mm	41	45	54	57	70	80	85	100	115	120
D	mm	49	55	62	70	88	100	107	120	144	165
Weight	kg	0.26	0.35	0.45	0.65	1.25	2.26	2.60	4.15	6.00	9.69

<b>Lock nut</b>											
SW	mm	32	41	41	50	60	70	80	90	90	110
L	mm	20	20	25	30	35	40	50	60	75	80
Weight	kg	0.08	0.14	0.15	0.28	0.45	0.87	1.21	2.16	2.18	4.54

<b>Coupler</b>											
D	mm	36	40	45	52	65	80	80	102	102	140
L	mm	105	115	125	140	160	170	200	230	260	290
Weight	kg	0.52	0.61	0.85	1.26	2.34	4.75	4.23	10.31	9.55	24.96

<b>Bearing plate for anchor nut</b>											
L	mm	70	70	100	120	150	170	190	220	245	275
E	mm	10	10	12	20	30	35	45	50	50	65
Weight	kg	0.33	0.35	0.86	2.06	4.90	7.40	11.82	17.69	22.38	35.60

<b>Bearing plate for domed nut</b>											
L	mm	70	70	100	120	150	170	190	220	245	275
E	mm	12	12	20	20	30	35	45	50	50	65
Weight	kg	0.37	0.34	1.33	1.91	4.48	6.61	10.78	16.25	20.09	32.60

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## Features

- Widest range of bar diameters from 20mm up to 75mm
- Continuous robust thread appropriate for all environmental conditions and suitable for cutting or lengthening with a coupler at any location
- High quality threaded bar system with superior fatigue performance
- Widest range of bar grades from 550MPa up to 1080MPa (ultimate)
- Full range of accessories facilitate easy and reliable installation
- Suitable for temporary or permanent applications
- Available in standard lengths of 11.8m (custom lengths on request)
- Tested to the latest international standards



## Applications

- Post-tensioning
- Geotechnical anchoring
- Ground stabilisation
- Temporary or permanent works
- Construction & civil engineering projects
- Concrete reinforcement

