

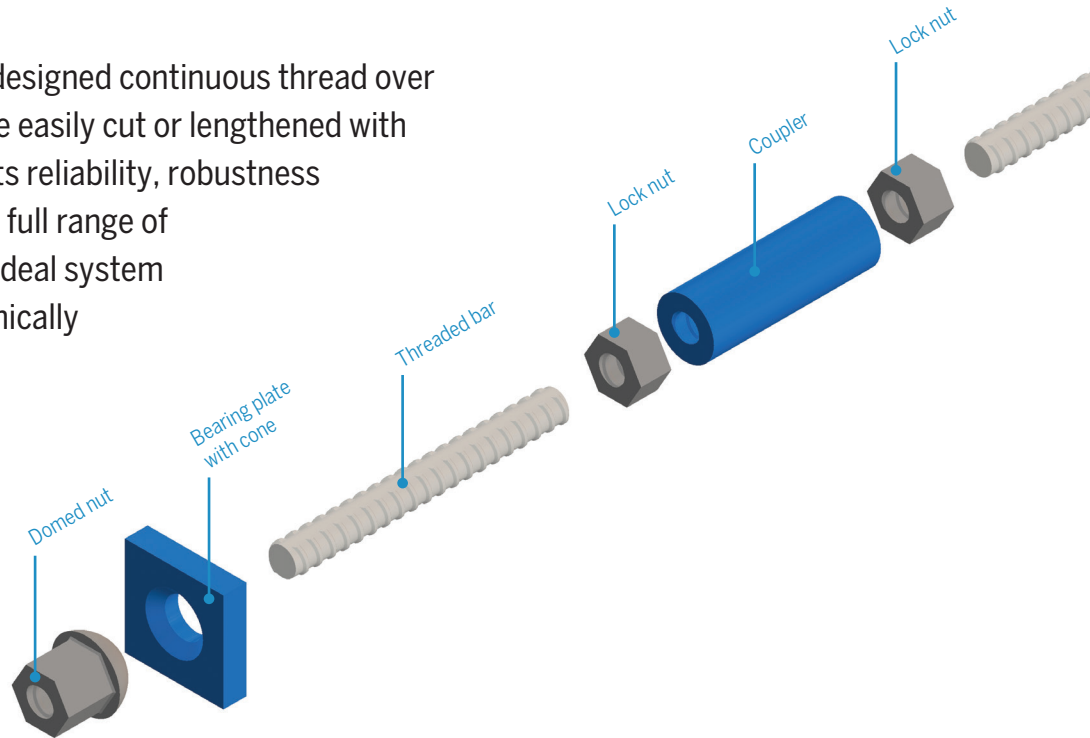
# BBR H Bar System

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

Hot Rolled Threaded Bars for Construction and Underground Applications



## 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

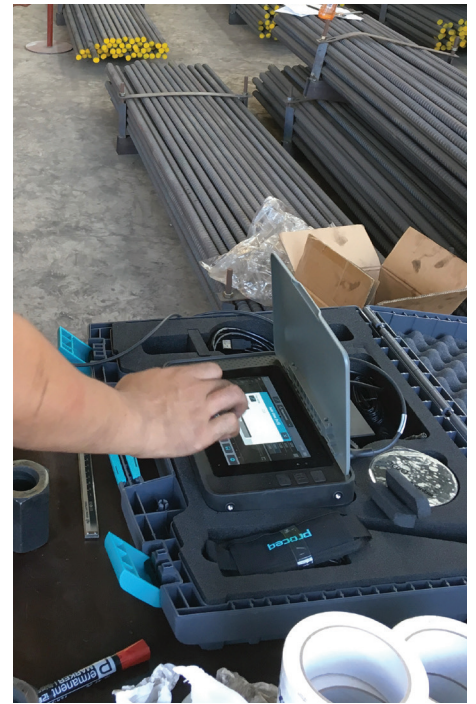
Static testing of tensile elements is carried out according to European norms and international standards.

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 ( $A_{gt}$ ) must meet values as 10% fractiles.  $A_{gt}$  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.

# BBR H Bar System

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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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WIEN

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H930 Bar System

Threaded Bar and Accessories Specifications

Property	Size	Component dimensions							
		ø25	ø32	ø36	ø40	ø50	ø57	ø63.5	ø75
Nominal diameter	mm	25	32	36	40	50	57	63.5	75
Yield stress	MPa	930	930	930	930	930	930	930	930
Ultimate stress	MPa	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080
Yield load	kN	457	748	947	1,169	1,826	2,373	2,945	4,109
Ultimate load	kN	530	869	1,099	1,357	2,120	2,756	3,420	4,771
Nom. cross-section	mm <sup>2</sup>	491	804	1,018	1,257	1,963	2,552	3,167	4,418
Weight	kg/m	4.1	6.7	8.4	10.3	16.3	21.6	26.5	36.9

Anchor nut									
SW	mm	50	60	65	70	80	90	102	105
L	mm	60	72	80	100	110	115	130	145
Weight	kg	0.7	1.2	1.5	2.0	2.7	3.9	5.7	5.5

Domed nut									
SW	mm	50	60	65	70	85	90	100	115
L	mm	75	90	100	115	145	115	115	190
D	mm	72	80	90	100	120	110	120	140
Weight	kg	1.1	1.8	2.3	3.1	5.4	4.7	6.0	11.2

Spherical nut									
SW	mm	50	60	65	70	80	90	102	105
L	mm	60	72	80	100	110	115	130	145
Weight	kg	0.6	1.2	1.4	2.0	2.7	3.9	5.7	5.5

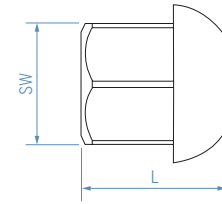
Coupler									
D <sub>ext</sub>	mm	50	60	70	75	88	95	102	115
L	mm	132	168	180	220	270	240	260	290
Weight	kg	1.4	2.5	3.6	5.1	8.9	7.75	9.6	12.3

Bearing plate for anchor nut									
L	mm	115	150	165	185	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	30	40	45	50	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	2.9	6.6	8.9	12.5	24.1	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

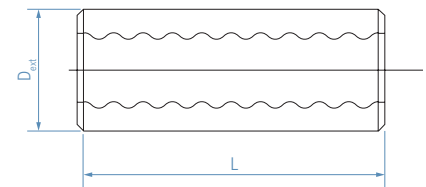
Bearing plate for domed nut									
L	mm	115	150	165	185	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	30	40	45	50	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
D	mm	35	45	50	55	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	2.7	6.3	8.5	11.9	23.5	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

Bearing plate for spherical nut									
L	mm	115	150	165	185	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	30	40	45	50	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
D	mm	35	45	50	55	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	2.8	6.4	8.8	12.3	23.9	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

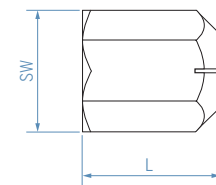
## Steel Accessories



Domed anchor nut



Coupler



Spherical anchor nut

Right-hand thread  
Elongation at max. load  $A_{gt} = 3.5\%$

<sup>1</sup> upon request for specific project(s)

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H835<sup>2</sup> Bar System

Threaded Bar and Accessories Specifications

Property	Size	Component dimensions							
		ø25	ø32	ø36	ø40	ø50	ø57	ø63.5	ø75
Nominal diameter	mm	25	32	36	40	50	57	63.5	75
Yield stress	MPa	830	830	830	830	830	835	835	835
Ultimate stress	MPa	1,030	1,030	1,030	1,030	1,030	1,035	1,035	1,035
Yield load	kN	407	667	845	1,043	1,629	2,131	2,644	3,689
Ultimate load	kN	505	828	1,048	1,294	2,022	2,641	3,278	4,573
Nom. cross-section	mm <sup>2</sup>	491	804	1,018	1,257	1,963	2,552	3,167	4,418
Weight	kg/m	4.1	6.7	8.4	10.3	16.3	21.6	26.5	36.9

Anchor nut									
SW	mm	50	60	65	70	80	90	102	105
L	mm	60	72	80	100	110	115	130	145
Weight	kg	0.7	1.2	1.5	2.5	2.7	3.9	5.7	5.5

Domed nut									
SW	mm	50	60	65	70	85	90	100	115
L	mm	75	90	100	115	145	115	115	190
D	mm	72	80	90	100	120	110	120	140
Weight	kg	1.1	1.8	2.3	3.1	5.4	4.7	6.0	11.2

Spherical nut									
SW	mm	50	60	65	70	80	90	102	105
L	mm	60	72	80	100	110	115	130	145
Weight	kg	0.6	1.2	1.4	2.0	2.7	3.9	5.7	5.5

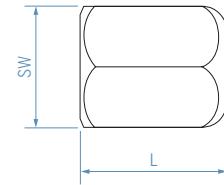
Coupler									
D <sub>ext</sub>	mm	50	60	70	75	88	95	102	115
L	mm	132	168	180	220	270	240	260	290
Weight	kg	1.4	2.5	3.6	5.1	8.9	7.75	9.6	12.3

Bearing plate for anchor nut									
L	mm	100	150	155	170	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	25	40	40	45	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	1.8	6.6	6.9	9.4	24.1	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

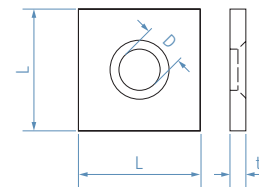
Bearing plate for domed nut									
L	mm	100	150	155	170	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	25	40	40	45	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
D	mm	35	45	50	55	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	1.6	6.3	6.6	8.9	23.5	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

Bearing plate for spherical nut									
L	mm	100	150	155	170	225	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
E	mm	25	40	40	45	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
D	mm	35	45	50	55	65	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>
Weight	kg	1.7	6.4	6.8	9.2	23.9	- <sup>1</sup>	- <sup>1</sup>	- <sup>1</sup>

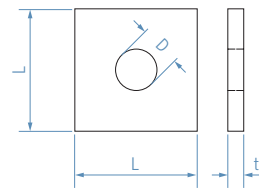
## Steel Accessories



Hex anchor nut



Bearing plate with cone



Bearing plate

<sup>1</sup> upon request for specific project(s) | <sup>2</sup> complies with H830 steel grade

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H670 Bar System

Threaded Bar Accessories 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	1,315	1,740	2,122	2,960
Ultimate load	kN	304	393	493	566	770	1,162	1,571	2,078	2,534	3,535
Nom. cross-section	mm <sup>2</sup>	380	491	616	707	962	1,466	1,960	2,597	3,167	4,418
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  $A_{gt} = 5\%$

Accessories 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 <sub>ext</sub>	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

\*Refer to previous page for dimension nomenclature.

# BBR H Bar System

Hot Rolled Threaded Bars for Construction and Underground Applications



## BBR H500 Bar System

Threaded Bar Accessories 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	1,441	1,758	2,209
Ultimate load	kN	172	270	339	442	691	799	1,078	1,818	2,217	2,430
Nom. cross-section	mm <sup>2</sup>	314	491	616	804	1,257	1,466	1,964	2,597	3,167	4,418
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  $A_{gt} = 6\% \leq \text{ø}32\text{mm}$

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

Accessories 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>											
$D_{ext}$	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

\*Refer to previous page for dimension nomenclature.

# 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, such as in groundwork applications, 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 1,080MPa (ultimate)
- Full range of accessories facilitate easy and reliable installation
- Suitable for temporary and 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 and permanent works
- Construction & civil engineering projects
- Concrete reinforcement

