

BBR SDX Bar System

Self-drilling bars for construction and underground applications



Rugged, reliable & strong



A Global Network of Experts
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The BBR Network is recognized as the leading group of specialized engineering contractors in the field of post-tensioning, stay cable and related construction engineering. The innovation and technical excellence, brought together in 1944 by its three Swiss founders – Antonio Brandestini, Max Birkenmaier and Mirko Robin Ros – continues, more than 70 years later, in that same ethos and enterprising style.

From its Technical Headquarters and Business Development Centre in Switzerland, the BBR Network reaches out around the globe and has at its disposal some of the most talented engineers and technicians, as well as the very latest internationally approved technology.

THE GLOBAL BBR NETWORK

Within the Global BBR Network, established traditions and strong local roots are combined with the latest thinking and leading edge technology. BBR grants each local BBR Network Member access to the latest technical knowledge and resources – and facilitates the exchange of information on a broad scale and within international partnering alliances. Such global alliances and co-operations create local competitive advantages in dealing with, for example, efficient tendering, availability of specialists and specialized equipment or transfer of technical know-how.

ACTIVITIES OF THE NETWORK

All BBR Network Members are well-respected within their local business communities and have built strong connections in their respective regions. They are all structured differently to suit the local market and offer a variety of construction services, in addition to the traditional core business of post-tensioning.

BBR TECHNOLOGIES & BRANDS

BBR technologies have been applied to a vast array of different structures – such as bridges, buildings, cryogenic LNG tanks, dams, marine structures, nuclear power stations, retaining walls, tanks, silos, towers, tunnels, wastewater treatment plants, water reservoirs and wind farms. The BBR™ brands and trademarks – CONA®, BBRV®, HiAm®, HiEx, DINA®, SWIF®, BBR E-Trace and CONNÆCT® – are recognized worldwide.

The BBR Network has a track record of excellence and innovative approaches – with thousands of structures built using BBR technologies. While BBR's history goes back over 70 years, the BBR Network is focused on constructing the future – with professionalism, innovation and the very latest technology.

BBR VT International Ltd is the Technical Headquarters and Business Development Centre of the BBR Network located in Switzerland. The shareholders of BBR VT International Ltd are BBR Holding Ltd (Switzerland), a subsidiary of the Tectus Group (Switzerland) and KB Spenneteknikk AS (Norway), a subsidiary of the KB Group (Norway).

Rugged, reliable & strong

The BBR SDX Bar System is offered to the construction and underground market with the same high Swiss quality standards and performance criteria that BBR customers have come to expect.

The BBR SDX Bar System is a fully threaded hollow bar system, complete with a selection of accessories, designed to suit the widest variety of ground conditions and working environments.

In producing this system, we have focused on delivering a quality solution based on seamless tubes, rather than welded tubes. This offers a higher degree of reliability – even when applied in extremely difficult terrain. Cold rolling technology refines the grain structure of the BBR SDX bar hence increasing the yield strength.

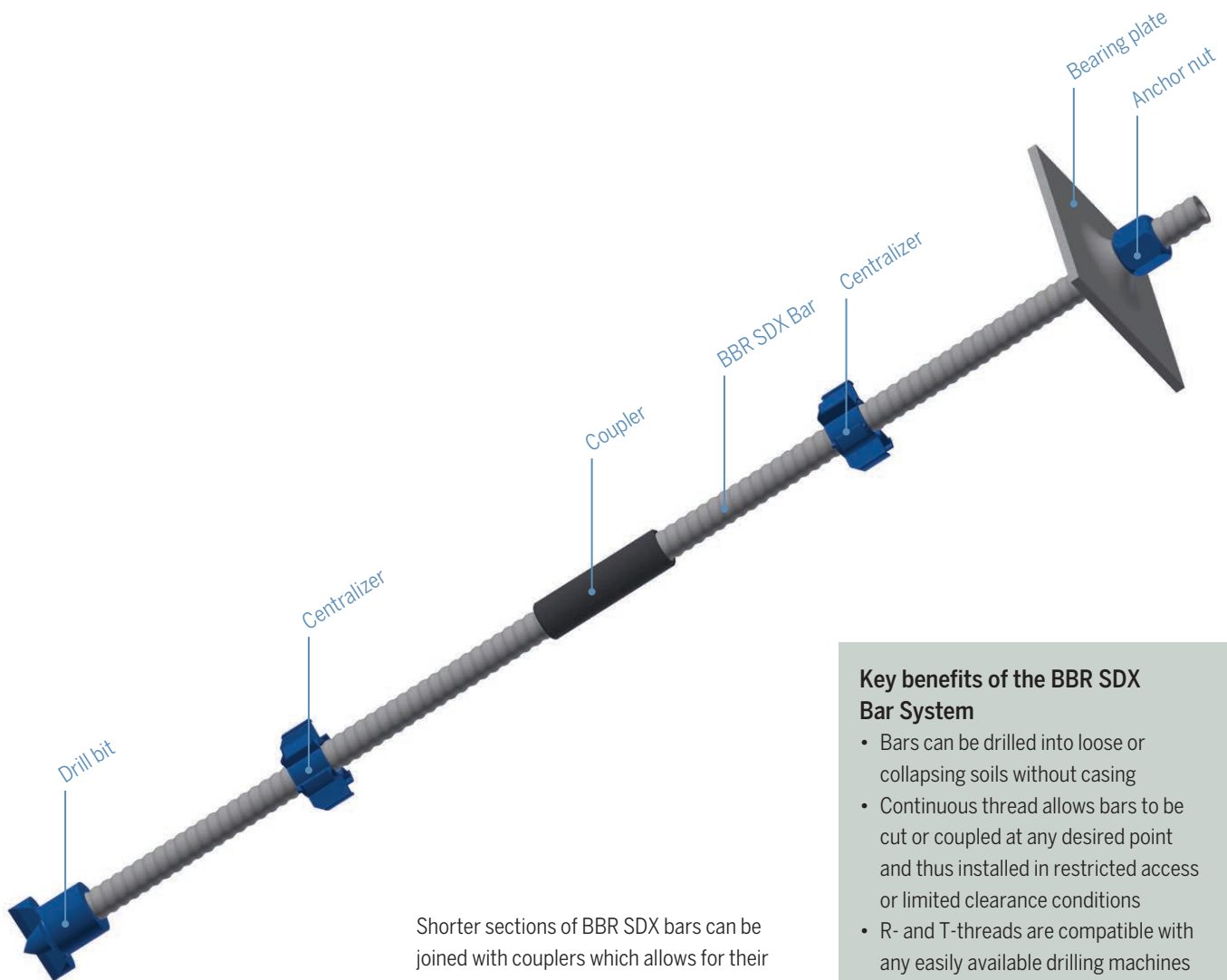
In the following pages, you will be able to learn more about the system features, applications, configurations, testing and quality assurance.

From the very start of the company, back in 1944, BBR engineers have constantly striven to produce the most advanced products and technology to support the ever-changing needs of the global communities in which it works. The BBR SDX Bar System was created as a direct result of feedback received from around the world. So, wherever you are and whatever your construction challenge – do keep talking to us!

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System features, advantages & applications

The BBR SDX Bar System combines versatility of application with ease of use and offers a solution for every construction and underground engineering challenge.



Key benefits of the BBR SDX Bar System

- Bars can be drilled into loose or collapsing soils without casing
- Continuous thread allows bars to be cut or coupled at any desired point and thus installed in restricted access or limited clearance conditions
- R- and T-threads are compatible with any easily available drilling machines and ensure excellent grout bonding
- Drilling bars can be used to flush and grout the borehole
- Grouting advances simultaneously with drilling and ensures proper grout distribution along the whole tendon length
- Mechanical properties of the system allow for application with compression, tension and altering forces
- Rotary or rotary-percussive drilling consolidates the ground around the tendon and increases system efficiency.

The BBR SDX Bar System is a fully threaded hollow bar system comprising couplers, anchor nuts, bearing plates and adapters – as well as a selection of drill bits designed to suit the widest variety of ground conditions. BBR SDX bars can be R- or T-shaped and allow for simultaneous drilling, borehole flushing and grout injection – and at the same time function as load bearing tendons.

Shorter sections of BBR SDX bars can be joined with couplers which allows for their application in confined or restricted spaces. BBR SDX bars cover ultimate force ranges from 200kN to 3,460kN and can be used for construction, as well as underground applications. The left- or right-handed thread is compatible with most common drilling machines and allows for rotary or rotary-percussive drilling. BBR SDX bars are produced as seamless hollow tubes which guarantee the highest quality and reliability – even in the most difficult and demanding ground conditions. In addition, cold rolling technology refines the grain structure of the BBR SDX bars and thereby increases the final yield strength.

Applications

The BBR SDX Bar System can be used as a micropile solution in accordance with EN 14199, for various applications including foundation upgrades for buildings, pylon bases, wind turbines and electricity transmission towers.

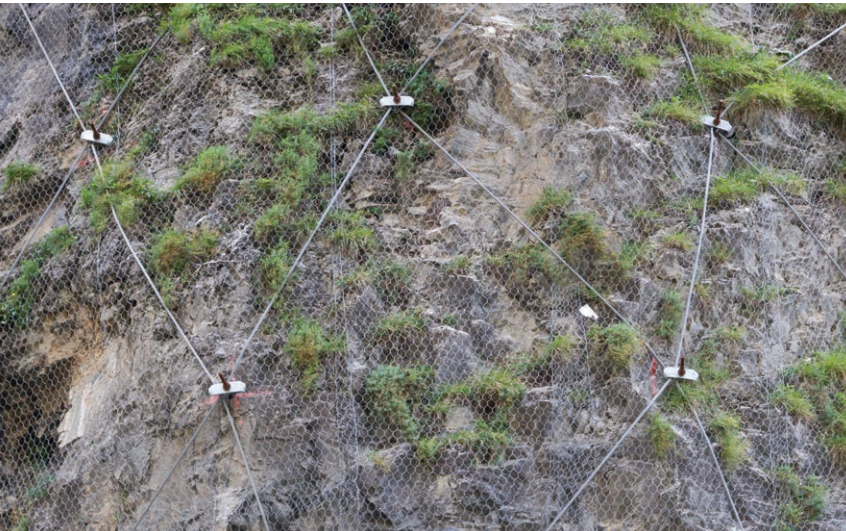
The system can also be used as lightly loaded and passive soil nails or rock bolts in accordance with EN 14490. An easy installation process, with options of borehole water or air flushing, along with simultaneous or post-installation grouting makes this solution a popular choice.

A comprehensive range of drill bits ensures the BBR SDX Bar System is suitable for standard as well as special ground and rock conditions. Among these special applications are the bolting of tunnel portals and strata support in the mining industry.

The application of BBR SDX bars as temporary anchors is based on EN 1537 and recommended for a broad range of difficult ground conditions including places which are not easily accessible or where access is restricted. These challenges can be overcome by using lightweight machinery to install the BBR SDX Bar System and dedicated drill bits which can cut through the local soils or rocks.

Typical applications

- Slope stabilization
- Rock fall protection
- Tie back anchorage
- Ground consolidation
- Uplift control
- Abutments
- Pile foundation
- Tie rods
- Face bolting
- Roof & rib bolting
- Injection works
- Radial bolting
- Portal stabilization
- Forepoling
- Footwall stabilization
- Utility hangers



Installation & best practice

Installation of the BBR SDX Bar System can be facilitated with lightweight machinery and the appropriate choice of drill bits from our range which is designed to handle most types of ground conditions.

Corrosion protection

Durability of the BBR SDX Bar System is dependent on ground conditions and the surrounding environment, as well as the applied working load. Three main types of corrosion protection are suitable for self-drilling bars:

- **Sacrificial corrosion allowance** – considers partial loss of cross-section over the service life, in order to assess the remaining strength of the bar and its ability to retain the required loading.
- **Galvanization** – popular solution to ensure additional corrosion protection of the system and limit negative influence of the ground and environmental conditions, SDX hot-dip galvanization is executed in line with ISO 1461 requirements.
- **Epoxy coating** – similar solution to galvanization, based on mixture of epoxy coatings and hardener. The final result is a hard and resistant finish on the system which can constitute an efficient additional corrosion protection measure in aggressive conditions.

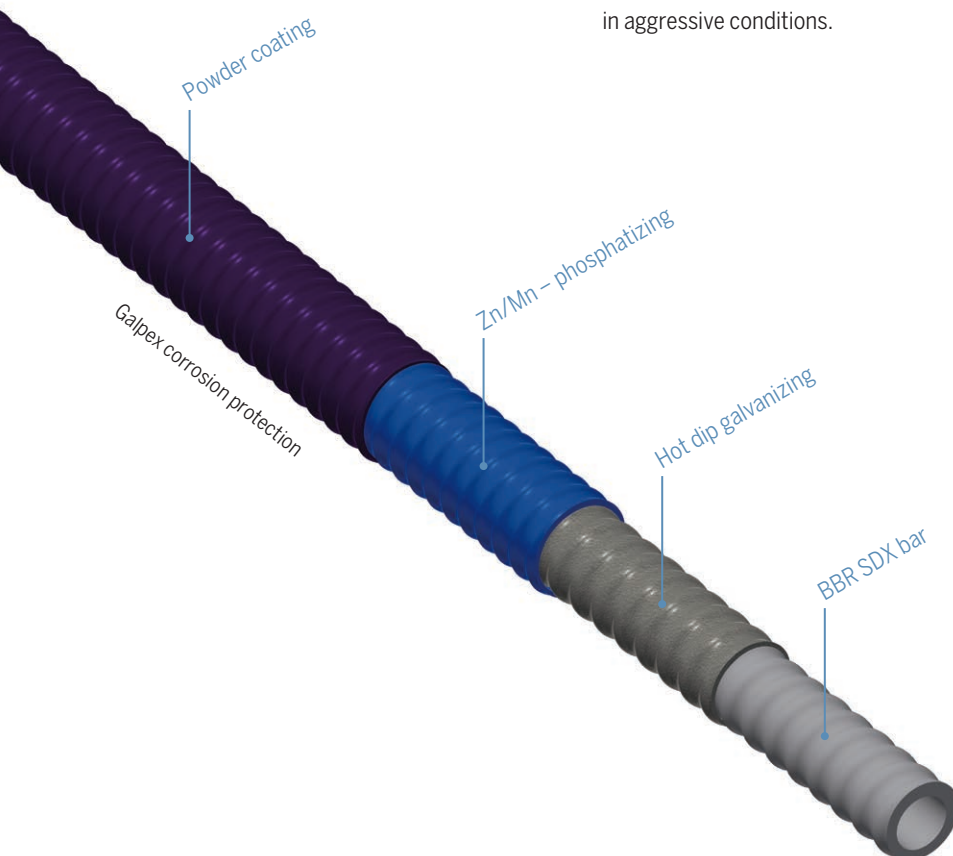
- **Galpex** – corrosion protection for steel products where a combination of hot-dip galvanizing, Zn/Mn-phosphatized and epoxy or polyester powder coating is applied. This combination is one of the best methods available for protection of exposed products. The durability is unique and gives the product considerable longevity, especially in corrosive acid environments.

Grouting

Simultaneous drilling and grouting can be applied for almost all ground conditions – from gravel to clay. This technique ensures that the grout extends throughout the full depth of the borehole. For ground conditions where the borehole may collapse, simultaneous drilling and grouting is preferred.

The correct rotation speed and drill motors with sufficient torque must be ensured – recommended speeds are: 120rpm - 150rpm for soil nails and 100rpm - 130rpm for micropiles. Generally, a water-to-cement ratio of 0.4 is advisable to ensure sufficient concrete strength, however, this may be recalculated to take account of local weather and ground conditions. These parameters reflect the usual ranges, however project-specific parameters should be provided by the project engineer.

If a simultaneous drilling and grouting procedure is chosen, steady pumping pressure and an adequate supply of grout material should be ensured.





Indications & recommendation

Indicative drilling depths*:

- R25 - R32 12 to 20m
- R38 - R51 24 to 30m
- T76 - T103 36 to 40m

Recommended bar lengths*:

- R25N, R32N - 2 to 3m
- R32S, R38N - 4 to 5m
- > R51 - 6m

*subject to ground conditions

Bar selection and drilling depths

The BBR SDX Bar System offers quick installation because drilling, borehole stabilization and grouting are combined in one cycle. However, in order to achieve that, proper equipment with enough torque capacity as well as the correct drilling depths and section lengths should be selected. Experience-based values for rotation drilling are 120rpm - 150rpm and 300bpm - 600bpm for percussion. Rotary-percussion drilling helps to ensure directional stability of the drilling string and consolidates ground along the borehole, thus achieving higher load bearing capacities of the system. The parameters above reflect the usual ranges, however project-specific parameters should be provided by the project engineer.



Drill bits & accessory selection

The BBR SDX Bar System features a selection of precision engineered drill bits and accessories that are designed to suit every construction application. These components are supplied to match with the sizes and specifications of the BBR SDX bar solution.

Type	Description	Drill bit types and related external diameters											
		T30	T40		T52	T73	T76	T103	R25	R32	R38	R51	
EX	Hardened cross for loose to medium dense ground conditions	ø42 ø46 ø51 ø76	ø76 ø90 ø100 ø115		ø115	ø130 ø170	ø130 ø170		ø42 ø51	ø51 ø76 ø90	ø76 ø90 ø100	ø90 ø115	
EXX	Tungsten carbide cross bit for soft to medium rock formations	ø42 ø46 ø51	ø76 ø100 ø130	ø90 ø115 ø150	ø115 ø130 ø150	ø130 ø150 ø200	ø130 ø150 ø200	ø175	ø42 ø51	ø51 ø76 ø90	ø76 ø90 ø100	ø90 ø115 ø150	ø100 ø130
ESF	Hardened button bit for unconsolidated rock without boulders	ø42 ø46 ø51	ø76 ø100 ø130	ø90 ø115					ø42 ø51	ø51 ø76	ø76 ø90 ø100	ø90 ø100	
ESD	Hardened button bit with drop centre for unconsolidated rock with boulders				ø115	ø130	ø130 ø170				ø115	ø115	
ESSF	Tungsten carbide button bit with flat drill face for medium rock formations	ø46 ø51	ø70 ø90 ø115	ø76 ø100 ø130	ø100 ø115	ø110 ø130	ø120 ø130 ø150	ø175	ø42 ø51	ø51 ø76 ø90	ø76 ø90 ø100 ø115	ø90 ø115 ø150	ø100 ø130
EW	Clay and loam, sandy-cohesive mixed soils without obstructions	ø76 ø90	ø90 ø130 ø150		ø130 ø150	ø130 ø150	ø130 ø150	ø220 ø280		ø76 ø90	ø76 ø90 ø110 ø130 ø150	ø130 ø150	
EC	Hardened arching bit for unconsolidated soil with small boulders	ø51	ø90 ø115							ø51 ø76	ø76 ø90 ø115	ø115	
ECC	Tungsten carbide arching bit for soft to medium rock formations	ø51	ø90 ø100 ø115							ø51 ø76	ø76 ø90 ø100 ø115	ø115	
EY	Hardened drop centre bit for fills and chalk									ø76 ø90	ø76 ø90 ø130	ø115	
EYY	TC drop centre bit with races blades for competent ground and strong rock									ø76 ø90	ø76 ø90 ø115	ø115	

other drill bits and diameters available on request



EX



EXX



ESF



ESD



ESSF



EW



EC



ECC



EY



EYY

Accessories

The BBR SDX Bar System comprises a wide selection of standard accessories, which are customizable on demand.

Drill bits

Drill bits are a crucial, yet sacrificial, part of the system which allow BBR SDX bars to be installed in various ground and rock conditions without unnecessary casing. The appropriate selection of drill bits contributes significantly to the final installed quality of the bars, as nails, micropiles or anchors in soil, rock or other materials such as existing concrete.

Depending on the drilling method, the diameter of the drill bit, centric or eccentric installation of the drill bit or reaming drilling can all improve ground conditions around the tendon and borehole by compacting the surrounding ground.

BBR offers a vast range of drill bits for a wide variety of ground conditions and bar diameters and also offers drill bits with a customized outside diameter. These are categorized by thread type and material – the R-type has a rope thread, while the T-type has a trapezoid shape of thread.

Anchor nuts

The standard range consists of spherical and domed anchor nuts, which in conjunction with the appropriate bearing plate, allow for angle compensation of up to 25 degrees.

Couplers

These enable coupling of bar sections and thus allow for use of shorter sections when working in restricted or confined spaces. The BBR SDX Bar System offers a coupler option with a middle stop which ensures equal coverage on both sides of the bar sections being coupled. Couplers are available with rounded or hexagonal exterior surfaces.

Bearing plates

Bearing plates transfer the force to the ground or structure from the anchor nut. The appropriate bearing plate should be chosen for the application. The BBR SDX Bar System includes bearing plates for spherical and domed anchor nuts.

Centralizer

Typical applications for the BBR SDX Bar System do not require any centralizers, as the selection of a larger drill bit diameter ensures sufficient grout cover around the tendon. Usage of centralizers improves grout cover around the bar sections.

Adapters

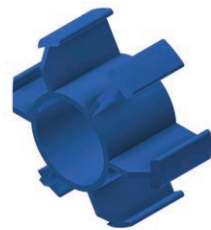
A larger borehole diameter contributes to higher loads in poor ground conditions and can be achieved by use of larger drill bits which are joined with smaller diameter bar by means of adapters.



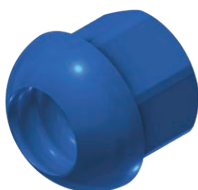
Spherical anchor nut



Bearing plate



Centralizer



Domed anchor nut

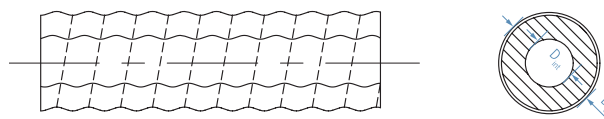


Coupler



Adapter

System Description – R Range



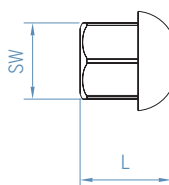
Self-drilling Hollow bar	Size	Component characteristics							
		R25	R32				R38	R51	
		R25-200	R32-260	R32-280	R32-360	R32-405	R38-500	R51-550	R51-800
Nominal diameter (external)	mm	25	32	32	32	32	38	51	51
Yield load	kN	150	200	230	280	300	400	450	630
Ultimate load	kN	200	260	280	360	405	500	550	800
Inner hole Diameter	mm	10	19	20	18.5	14	19	36	28
Nominal section	mm ²	318	395	363	433	535	764	803	1121
Weight	kg/m	2.5	3.1	2.9	3.4	4.2	6.0	6.3	8.8

Anchor nut	Size	Component characteristics							
		R25	R32				R38	R51	
		R25-200	R32-260	R32-280	R32-360	R32-405	R38-500	R51-550	R51-800
Nominal diameter	mm	25	32	32	32	32	38	51	51
SW	mm	41	46	46	46	46	50	75	75
L	mm	35	45	45	65	65	60	70	70
Weight	kg	0.3	0.4	0.4	0.6	0.6	0.5	1.5	1.5

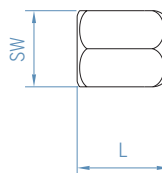
Coupler	Size	Component characteristics							
		R25	R32				R38	R51	
		R25-200	R32-260	R32-280	R32-360	R32-405	R38-500	R51-550	R51-800
Nominal diameter	mm	25	32	32	32	32	38	51	51
D _{ext}	mm	36	42	42	42	42	52	63	63
L	mm	150	145	160	190	190	220	140	200
Weight	kg	0.6	0.7	0.8	1.0	1.0	1.8	1.3	1.9

Bearing plate	Size	Component characteristics							
		R25	R32				R38	R51	
		R25-200	R32-260	R32-280	R32-360	R32-405	R38-500	R51-550	R51-800
Nominal diameter	mm	25	32	32	32	32	38	51	51
L	mm	150	200	200	200	200	200	200	250
t	mm	8	10	10	12	12	12	30	40
D	mm	30	35	35	35	35	41	60	60
Weight	kg	1.4	3.0	3.0	3.3	3.3	3.6	8.8	18.5

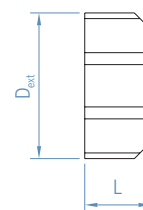
Centralizer	Size	Component characteristics							
		R25	R32				R38	R51	
		R25-200	R32-260	R32-280	R32-360	R32-405	R38-500	R51-550	R51-800
Nominal diameter	mm	32	32	32	32	32	38	52	52
L	mm	30	30	30	30	30	41	70	70
D _{ext}	mm	72	72	72	72	72	72	68	68
Weight	kg	0.3	0.3	0.3	0.3	0.3	0.3	1.2	1.2



Domed anchor nut



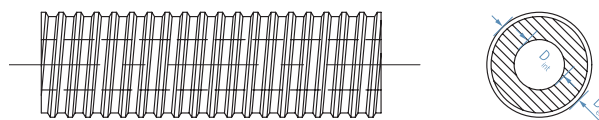
Hex anchor nut



Centralizer

Elongation at maximum load $A_{gt} > 5\%$
 Thread type conforming with ISO 10208
 Thread direction: left- or right-hand thread
 Available lengths: 1m - 9m

System Description – T Range



Self-drilling Hollow bar	Size	Component characteristics													
		T30			T40		T52	T73				T76		T103	
		T30-220	T30-260	T30-320	T40-540	T40-660	T52-929	T73-1035	T73-1160	T73-1575	T73-1865	T76-1600	T76-1900	T103-2280	T103-3460
Nominal diameter (external)	mm	30	30	30	40	40	52	73	73	73	73	76	76	103	103
Yield load	kN	180	220	260	430	525	730	830	970	1270	1430	1200	1500	1800	2730
Ultimate load	kN	220	260	320	540	660	929	1035	1160	1575	1865	1600	1900	2280	3460
Inner hole Diameter	mm	16	14	11	20	16	26	56	53	45	35	49	45	78	51
Nominal section	mm ²	344	357	420	739	917	1261	1401	1682	2268	2701	2229	2675	3223	5682
Weight	kg/m	2.7	2.8	3.3	5.8	7.2	9.9	11.0	13.2	17.8	21.2	17.5	21.0	25.3	44.6

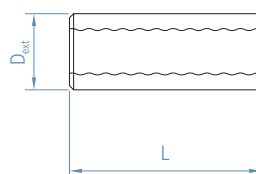
Anchor nut	Size	Component characteristics													
		T30			T40		T52	T73				T76		T103	
		T30-220	T30-260	T30-320	T40-540	T40-660	T52-929	T73-1035	T73-1160	T73-1575	T73-1865	T76-1600	T76-1900	T103-2280	T103-3460
Nominal diameter	mm	30	30	30	40	40	52	73	73	73	73	76	76	103	103
SW	mm	46	46	46	65	65	80	95	95	95	95	100	100	125	125
L	mm	35	35	35	50	50	70	70	70	70	70	80	80	80	80
Weight	kg	0.4	0.4	0.4	0.9	0.9	2.4	2.2	2.2	2.2	2.2	2.7	2.7	3.4	3.4

Coupler	Size	Component characteristics													
		T30			T40		T52	T73				T76		T103	
		T30-220	T30-260	T30-320	T40-540	T40-660	T52-929	T73-1035	T73-1160	T73-1575	T73-1865	T76-1600	T76-1900	T103-2280	T103-3460
Nominal diameter	mm	30	30	30	40	40	52	73	73	73	73	76	76	103	103
D _{ext}	mm	38	38	38	54	57	70	89	89	95	95	95	97	123	132
L	mm	105	105	105	140	140	160	235	235	245	245	200	220	255	290
Weight	kg	0.4	0.4	0.4	1.2	1.4	2.3	4.3	4.3	6.2	6.2	4.3	5.4	7.4	12.5

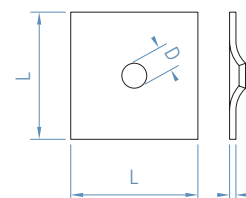
Bearing plate	Size	Component characteristics													
		T30			T40		T52	T73				T76		T103	
		T30-220	T30-260	T30-320	T40-540	T40-660	T52-929	T73-1035	T73-1160	T73-1575	T73-1865	T76-1600	T76-1900	T103-2280	T103-3460
Nominal diameter	mm	30	30	30	40	40	52	73	73	73	73	76	76	103	103
L	mm	200	200	200	200	200	220	250	250	250	250	250	250	300	300
t	mm	8	8	8	12	15	35	40	40	40	40	40	40	50	50
D	mm	36	36	36	54	54	65	80	80	80	80	80	80	110	110
Weight	kg	2.5	2.5	2.5	3.5	4.6	12.1	8.0	8.0	8.0	8.0	19.1	19.1	32.6	32.6

Centralizer	Size	Component dimensions													
		T30			T40		T52	T73				T76		T103	
		T30-220	T30-260	T30-320	T40-540	T40-660	T52-929	T73-1035	T73-1160	T73-1575	T73-1865	T76-1600	T76-1900	T103-2280	T103-3460
Nominal diameter	mm	30	30	30	40	40	52	73	73	73	73	73	73	103	103
L	mm	37	37	37	40	40	70	80	80	80	80	80	80	80	80
D _{ext}	mm	88	88	88	88	88	68	87	87	87	87	87	87	110	110
Weight	kg	0.3	0.3	0.3	0.4	0.4	1.2	1.2	1.2	1.2	1.2	1.2	1.2	2.9	2.9

Elongation at maximum load $A_{gt} > 5\%$
 Thread type conforming with T international standard
 Thread direction: left- or right-hand thread
 Available lengths: 1m - 9m



Coupler



Bearing plate

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 require that each product conforms to the highest applicable standards and reaches 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 SDX Bar System.

We have carried out demanding mechanical and material tests on the system comprising bar and anchoring accessory components – and for both R and T thread bars. All the tests were executed in independent accredited laboratories. The testing results proved that the BBR SDX Bar System not only complies with the relevant European norms, standards and guidelines, but also fulfills additional requirements specified by local authorities in other regions, such as Australia and New Zealand, and meets the ISO 1720 and 10208 standards for rock drilling.

Static test on tensile bar element

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.

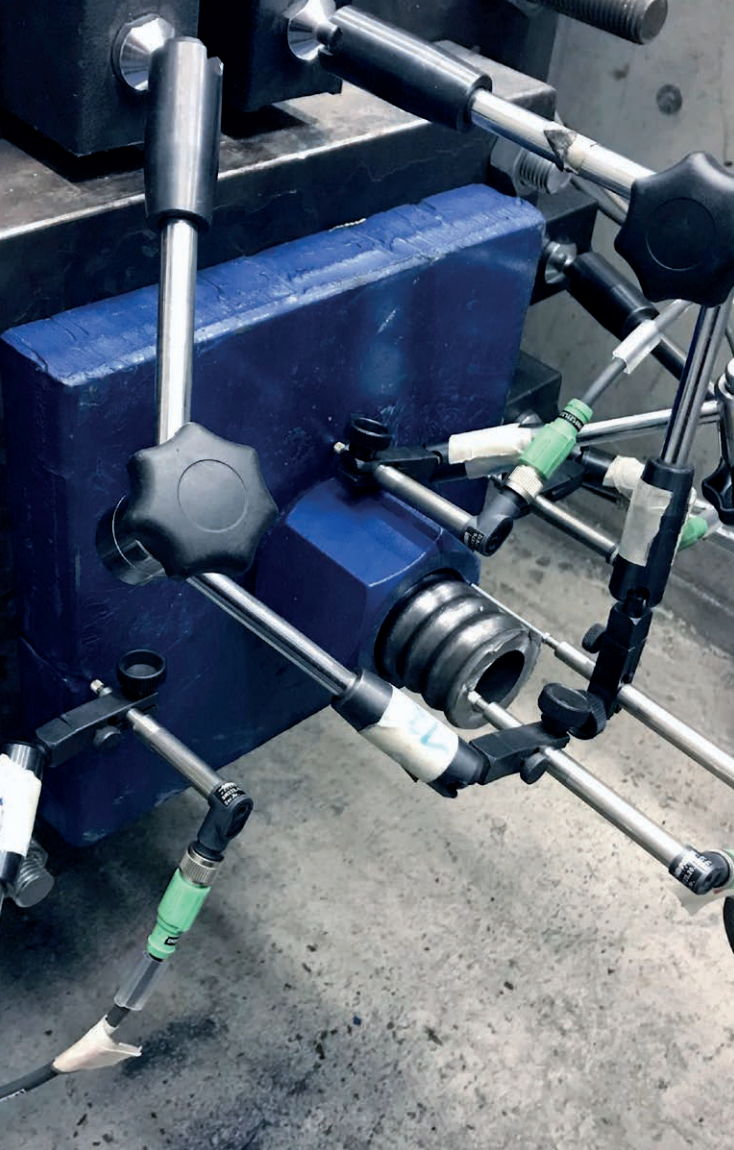
A_{gt} is expected to be at least 5%, while for the smallest size 2.5% might be acceptable.

Static test on bar system

To verify the resistance of the BBR SDX Bar System against static load, a complete bar system kit – consisting of a BBR SDX bar, bearing plates, anchor nuts and coupler – is assembled according to the envisaged final application. The assembled system is stressed in equal stages up to 80% of the ultimate characteristic force using standard stressing equipment. Subsequently the load on the bar system kit is maintained for one

hour and immediately after, gradually stressed until complete failure. The measured maximum load should not be less than 95% of the actual ultimate strength and the failure of the bar system kit should not be induced by the failure of the anchorage nut or couplers. During the test, the elongation of the system during loading is continuously measured as well as any relative movement between the anchor nut and the bearing plate or between the coupler and the bar.





Fatigue test on tensile bar element

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.

Fatigue test on bar system

To verify the resistance of the BBR SDX Bar System against fatigue, a complete bar system kit – consisting of a BBR SDX bar, bearing plates, anchor nuts and coupler – is assembled according to the envisaged final application and stressed up to 65% of the ultimate characteristic force. Subsequently the bar system kit is subjected to a fatigue test with two million load cycles at an upper load of 65% and an axial stress of 80 MPa. At the end of the fatigue test there should not be failures due to fatigue, neither at the free length nor at the anchor nuts or couplers.

During the test, the elongation of the system during initial loading is measured as well as any correlation with the number of cycles of the relative movement between the anchor nut and the bearing plate or between the coupler and the bar.

Verification of load transfer in the anchorage zone

For load transfer, for certain applications, the anchorage zone, including concrete with recommended dimensions for a particular concrete strength, should be designed and verified according to the European and international codes and technical approval guidelines.

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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Excellence meets experience

In over seven decades of experience, BBR technology has been applied to thousands of structures around the world. During this time, based on our continuous commitment to excellence in construction technology and techniques, we have continued to refine and enhance our range.



The BBR SDX Bar System brings together the finest construction engineering technology with feedback from our international customers who can be certain that their projects will benefit from:

- Robust and flexible solutions based on experience
- Independently tested and certified technology
- Stringent European Factory Production Control
- Full traceability through BBR's unique E-Trace platform
- Quality control inspections by BBR engineers
- Installation by a well-trained, talented network of construction professionals.

Our Swiss roots are deeply embedded in technological development and, down the years, we have introduced the most advanced products and technology to the international market place.

Today, this combines with a strong global network – the BBR Network of Experts – who first listen, then advise and deliver best-in-class solutions to customers around the globe.



The BBR Network –
international expertise &
technology delivered locally



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