

SELF-DRILLING ANCHORS TECHNICAL DATA SHEET



DEFINING THE FUTURE
UNDERGROUND

normet

normet.com

GENERAL DESCRIPTION

The main feature of the Normet Self-Drilling Anchor (SDA) system is the application of a single-use drill bit in combination with the rock bolt being used as a drill steel. Thus, the rock bolt is connected to the hydraulic rock drill by an adapter device and installed in the way a conventional borehole is drilled. The Normet SDA program consists of the following:

- > Single-use drill bits, which are available either hardened or with carbide inserts
- > Hollow, steel bars, with a continuous outside thread
- > Steel couplings, with a continuous inside thread
- > Steel nuts
- > Steel face plates

The bolts in this TDS are classified according to thread type and material:

R-type has a ISO 10208 rope thread, and is available in sizes from R25 to R51.

T-type is according to industry standard, and is available in sizes from T30 to T103.

FRP bolts are made out of fiberglass and are available from S15 to SXX in both solid and hollow versions.

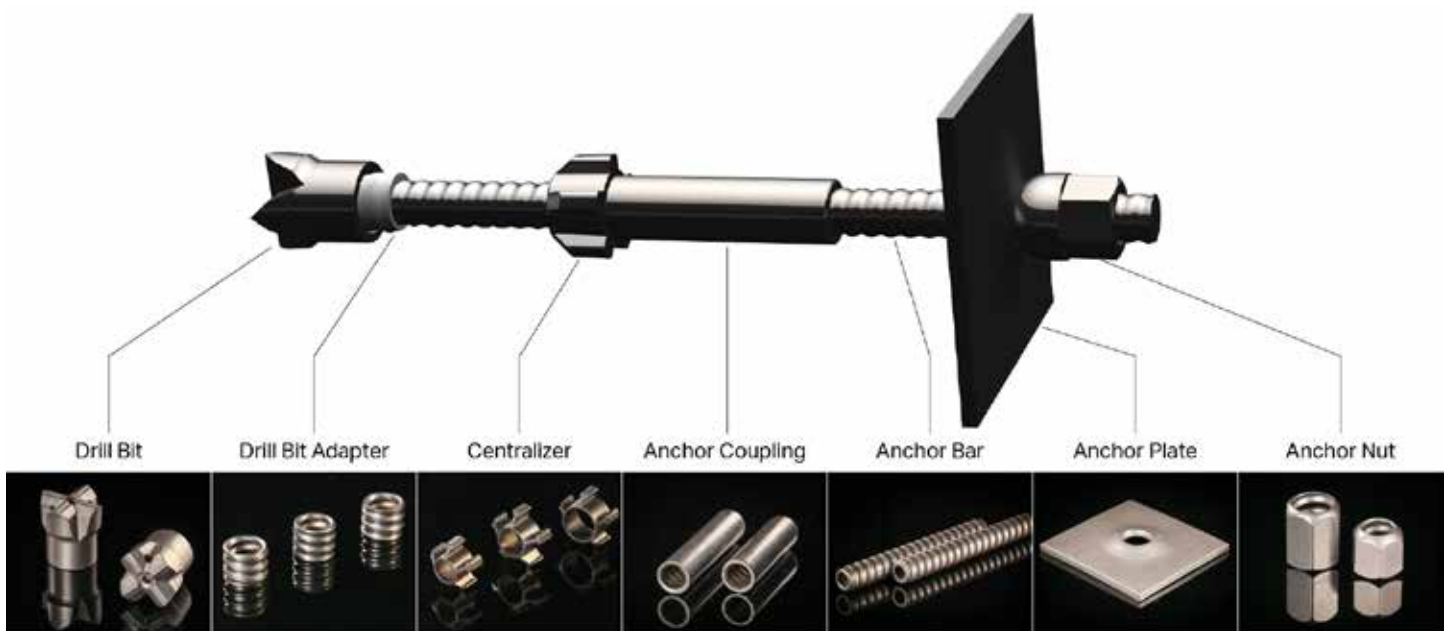
Applications

The Normet SDA system is suitable for simultaneous drilling and grouting in different applications:

| Tunnelling and mining: | Ground Engineering: |
|------------------------|------------------------------------|
| Radial bolting | Ground consolidation and injection |
| Spiling | Soil nailing |
| Face stabilisation | Slope stabilisation |
| Portal preparation | Microinjection pile |
| | Temporary support anchoring |

The Normet SDA system may be used for different rock conditions, and drill bits are available in different designs and diameters. The thread types are compatible to international standards and can easily be adapted to standard rock drilling equipment. The SDA range is available in different load capacity classes, depending on the outer and inner diameter of the bar.

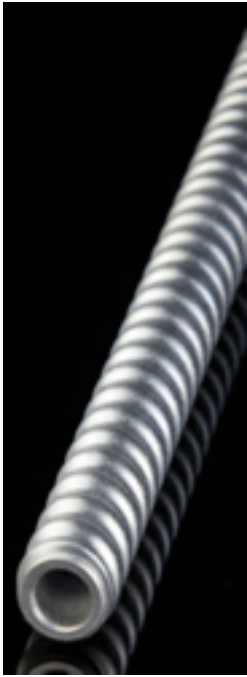
The self-drilling installation of the bolts is similar to the drilling of a conventional borehole: The hollow bar is connected to the shank adapter via a coupling and is being utilized as drill steel; the single-use drill bit is put at the top of the hollow bar. In case where larger bolt lengths are required, the bars can easily be extended by couplings.



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R25 SYSTEM

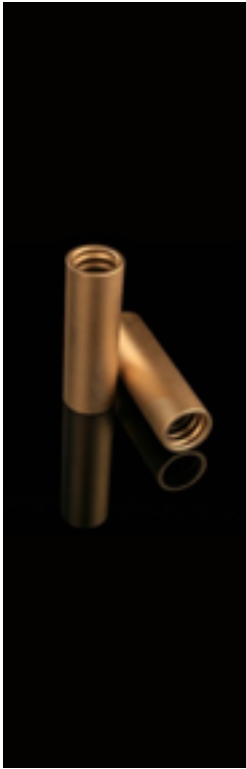


| Bar | R25N |
|---|---|
| Outside Diameter (mm) | 25 |
| Internal Diameter (mm) | 12 |
| Cross Sectional Area (mm ²) | 292 |
| Ultimate Load (kN) | 200 |
| Yield Load (kN) | 150 |
| Weight (kg/m) | 2.3 |
| Thread Type | ISO10208 |
| Type of Steel | EN10083-1 |
| Thread (Left / Right hand) | Left or Right |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

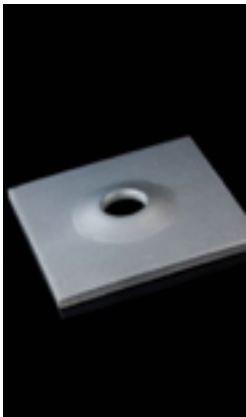


| Nut | R25N |
|----------------------------|--|
| Key Size (mm) | 41 |
| Length (mm) | 35 |
| Hardness (HRC) | 25 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. |
| Thread Type | ISO10208 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 0.25 |
| Thread (Left / Right hand) | Left or Right |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

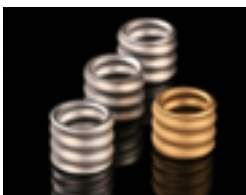
R25 SYSTEM



| Coupling | R25N |
|----------------------------|--|
| Outside Diameter (mm) | 36 |
| Length (mm) | 150 |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. |
| Thread Type | ISO10208 |
| Type of Steel | EN10083-1 |
| Unit Weight (kg) | 0.60 |
| Thread (Left / Right hand) | Left or Right |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |



| Plate | R25N |
|----------------------------|---|
| Size (mm) | 150 x 150 |
| Thickness (mm) | 8 |
| Hole Diameter (mm) | 30 |
| Unit Weight (kg) | 1.4 |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |



| Drill bit adapter | R25N |
|-------------------|-----------------|
| Anchor Bar Thread | R25 |
| Drill Bit Thread | R32 / R38 / T40 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.1 |

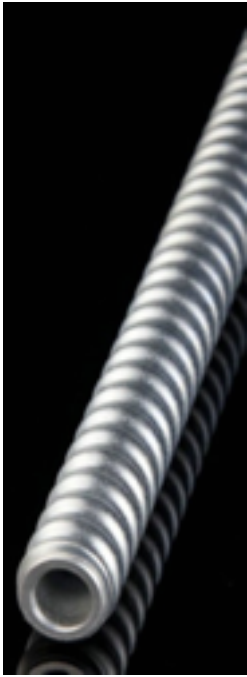
R25 SYSTEM

SDA System
Technical Data Sheet

| Drill bit | EX | EXX | ESF | ESSF |
|---|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D42 / 0.30 D51 / 0.40 | D42 / 0.30 D51 / 0.40 | D42 / 0.30 D51 / 0.40 | D42 / 0.30 D51 / 0.40 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | ISO 10208 | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item number | Item Description | Unit of Measure |
|-------------|---|-----------------|
| 100100693 | Bar, R25N | m |
| 100100694 | Bar, R25N Hot-dipped Galvanization | m |
| 100100695 | Bar, R25N Double Coated | m |
| 100087091 | Nut, R25N | pcs |
| 100100696 | Nut, R25N Hot-dipped Galvanization | pcs |
| 100100697 | Nut, R25N Double Coated | pcs |
| 100100698 | Coupling, R25N | pcs |
| 100100699 | Coupling, R25N Hot-dipped Galvanization | pcs |
| 100100700 | Coupling, R25N Double Coated | pcs |
| 100087090 | Plate, R25N | pcs |
| 100100701 | Plate, R25N Hot-dipped Galvanization | pcs |
| 100100702 | Plate, R25N Double Coated | pcs |
| 100099074 | Adapter, Drill Bit Adapter R25 – R32 | pcs |
| 100100703 | Adapter, Drill Bit Adapter R25 – R38 | pcs |
| 100100704 | Adapter, Drill Bit Adapter R25 – T40 | pcs |
| 100100705 | Drill Bit, R25N EX D42 | pcs |
| 100100706 | Drill Bit, R25N EX D51 | pcs |
| 100087034 | Drill Bit, R25N EXX D42 | pcs |
| 100100707 | Drill Bit, R25N EXX D51 | pcs |
| 100100708 | Drill Bit, R25N ESF D42 | pcs |
| 100100709 | Drill Bit, R25N ESF D51 | pcs |
| 100087641 | Drill Bit, R25N ESSF D42 | pcs |
| 100100710 | Drill Bit, R25N ESSF D51 | pcs |

R28 SYSTEM

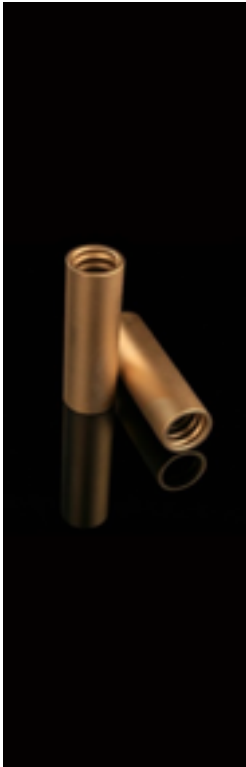


| Bar | R28 |
|---|---|
| Outside Diameter (mm) | 28 |
| Internal Diameter (mm) | 15 |
| Cross Sectional Area (mm ²) | 439 |
| Ultimate Load (kN) | 260 |
| Yield Load (kN) | 200 |
| Weight (kg/m) | 2.90 |
| Thread Type | ISO 10208 R28 |
| Type of Steel | EN10083-1 |
| Thread (Left / Right hand) | Left hand |
| Length (m) | Available in 1m; 2m; 3m and 4m. other length on request |
| Optional of Anti-corrosion | Hot Dipped Galvanization – HDG according to ISO 1461 Epoxy coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

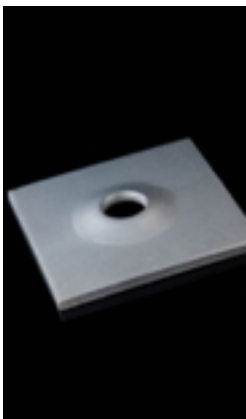


| Nut | R28 |
|----------------------------|--|
| Key Size (mm) | 46 |
| Length (mm) | 45 |
| Hardness (HRC) | 25-30 |
| Thread Type | ISO 10208 R28 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 0.44 |
| Thread (Left / Right hand) | Left hand |
| Optional of Anti-corrosion | HDG according to ISO 1461 Epoxy coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

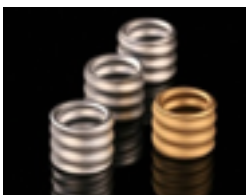
R28 SYSTEM



| Coupling | R28 |
|----------------------------|--|
| Outside Diameter (mm) | 36 |
| Length (mm) | 150 |
| Hardness (HRC) | 23-30 |
| Thread Type | ISO 10208 R28 |
| Type of Steel | EN10083-1 |
| Unit Weight (kg) | 0.53 |
| Thread (Left / Right hand) | Left hand |
| Optional of Anti-corrosion | HDG according to ISO 1461 Epoxy coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |



| Plate | R28 |
|----------------------------|--|
| Size (mm) | 150x150 ; 200x200 |
| Thickness (mm) | 6 ; 10 |
| Hole Diameter (mm) | 35 |
| Unit Weight (kg) | 1 ; 2.94 |
| Optional of Anti-corrosion | HDG according to ISO 1461 Epoxy coating: Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |



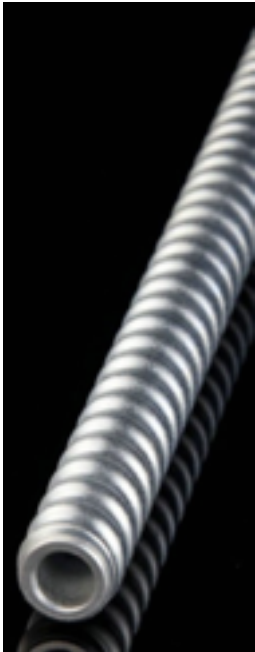
| Drill bit adapter | R28 |
|-------------------|-----------|
| Anchor Bar Thread | R28 |
| Drill Bit Thread | R32 / R38 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.1 |

R28 SYSTEM

| Drill bit | EX | EXX | ESF | ESSF |
|---|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D38 / 0.24 D42 / 0.30 D51 / 0.40 | D38 / 0.26 D42 / 0.32 D51 / 0.42 | D38 / 0.24 D42 / 0.30 D51 / 0.40 | D38 / 0.26 D42 / 0.32 D51 / 0.42 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | ISO 10208 R28 | | | |
| Type of Steel | EN 10083-1 | | | |
| Thread (Left / Right hand) | Left hand (CCW) | | | |

R32 SYSTEM

SDA System
Technical Data Sheet



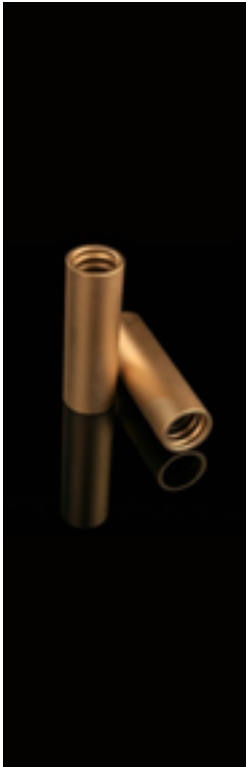
| Bar | R32L | R32N/21 | R32N/18.5 | R32S | R32SS |
|---|--|---------|-----------|------|-------|
| Outside Diameter (mm) | 32 | | | | |
| Internal Diameter (mm) | 22 | 21 | 18.5 | 17 | 14 |
| Cross Sectional Area (mm ²) | 356 | 363 | 433 | 440 | 522 |
| Ultimate Load (kN) | 260 | 280 | 280 | 360 | 405 |
| Yield Load (kN) | 200 | 230 | 230 | 280 | 300 |
| Weight (kg/m) | 2.8 | 2.85 | 3.4 | 3.45 | 4.1 |
| Thread Type | ISO10208 | | | | |
| Type of Steel | EN10083-1 | | | | |
| Thread (Left / Right hand) | Left or Right | | | | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | | |



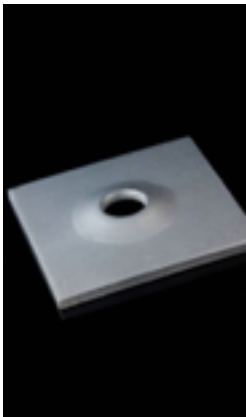
| Nut | R32L | R32N/21 | R32N/18.5 | R32S | R32SS |
|----------------------------|---|---------|-----------|------|-------|
| Key Size (mm) | 46 | | | | |
| Length (mm) | 45 | | | 65 | |
| Hardness (HRC) | 25 - 30 (*) | | | | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | | | |
| Thread Type | ISO10208 | | | | |
| Type of Steel | CK45 | | | | |
| Unit Weight (kg) | 0.35 | | | 0.53 | |
| Thread (Left / Right hand) | Left or Right | | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | | |

R32 SYSTEM

SDA System
Technical Data Sheet



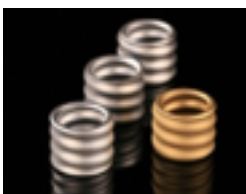
| Coupling | R32L | R32N/21 | R32N/18.5 | R32S | R32SS |
|----------------------------|--|---------|-----------|------|-------|
| Outside Diameter (mm) | 42 | | | | |
| Length (mm) | 145 | 160 | | 190 | |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | | | |
| Thread Type | ISO10208 | | | | |
| Type of Steel | EN10083-1 | | | | |
| Unit Weight (kg) | 0.72 | 0.8 | | 0.96 | |
| Thread (Left / Right hand) | Left or Right | | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | | |



| Plate | R32L | R32N/21 | R32N/18.5 | R32S | R32SS |
|----------------------------|--|---------|-----------|------|-------|
| Size (mm) | 200 x 200 | | | | |
| Thickness (mm) | 10 | | | 12 | |
| Hole Diameter (mm) | 35 | | | | |
| Unit Weight (kg) | 3 | | | 3.3 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | | |



| Centralizer | R32L | R32N/21 | R32N/18.5 | R32S | R32SS |
|-----------------------|------|---------|-----------|------|-------|
| Outside Diameter (mm) | 72 | | | | |
| Length (mm) | 30 | | | | |
| Hole Diameter (mm) | 41 | | | | |
| Type of Steel | CK45 | | | | |
| Unit Weight (kg) | 0.3 | | | | |



| Drill Bit Adapter | R32 |
|-------------------|-----------------------|
| Anchor Bar Thread | R32 |
| Drill Bit Thread | R38 / R51 / T40 / T52 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.1 |

R32 SYSTEM

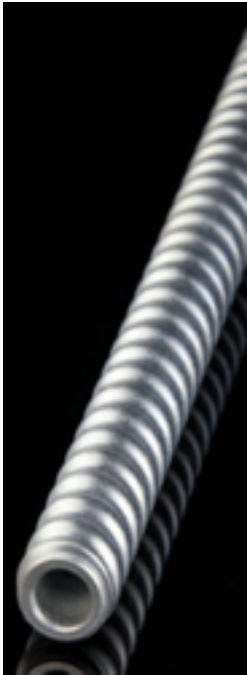
SDA System
Technical Data Sheet

| Drill Bit | EX | EXX | ESF | ESSF |
|--|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D51 / 0.35 D76 / 0.40 D90 / 1.60 | D51 / 0.40 D76 / 1.20 D90 / 2.30 | D51 / 0.42 D76 / 1.25 | D51 / 0.47 D76 / 1.60 D90 / 1.90 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | ISO 10208 | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item number | Item Description | Unit of Measure |
|-------------|--|-----------------|
| 100100711 | Bar, R32L | m |
| 100100712 | Bar, R32L Hot-dipped Galvanization | m |
| 100100713 | Bar, R32L Double Coated | m |
| 100100714 | Bar, R32N/21 | m |
| 100100715 | Bar, R32N/21 Hot-dipped Galvanization | m |
| 100100716 | Bar, R32N/21 Double Coated | m |
| 100099097 | Bar, R32N / 18.5 | m |
| 100100717 | Bar, R32N / 18.5 Hot-dipped Galvanization | m |
| 100100718 | Bar, R32N / 18.5, Double Coated | m |
| 100099098 | Bar, R32S | m |
| 100100719 | Bar, R32S Hot-dipped Galvanization | m |
| 100100720 | Bar, R32S Double Coated | m |
| 100100721 | Bar, R32SS | m |
| 100100722 | Bar, R32SS Hot-dipped Galvanization | m |
| 100100458 | Bar, R32SS Double Coated | m |
| 100099105 | Nut, R32L / R32N21 / R32N18.5 | pcs |
| 100100723 | Nut, R32L / R32N21 / R32N18.5 Hot-dipped Galvanization | pcs |
| 100100724 | Nut, R32L / R32N21 / R32N18.5 Double Coated | pcs |
| 100087082 | Nut, R32S / R32SS | pcs |
| 100100725 | Nut, R32S / R32SS Hot-dipped Galvanization | pcs |
| 100100461 | Nut, R32S / R32SS Double Coated | pcs |
| 100100726 | Coupler, R32L | pcs |
| 100100727 | Coupler, R32L Hot-dipped Galvanization | pcs |
| 100100728 | Coupler, R32L Double Coated | pcs |
| 100100729 | Coupler, R32N21 / R32N18.5 | pcs |
| 100100730 | Coupler, R32N21 / R32N18.5 Hot-dipped Galvanization | pcs |

| Item number | Item Description | Unit of Measure |
|-------------|--|-----------------|
| 100100731 | Coupler, R32N21 / R32N18.5 Double Coated | pcs |
| 100087080 | Coupler, R32S / R32SS | pcs |
| 100100732 | Coupler, R32S / R32SS Hot-dipped Galvanization | pcs |
| 100100462 | Coupler, R32S / R32SS Double Coated | pcs |
| 100100733 | Plate, R32L / R32N21 / R32N18.5 | pcs |
| 100100734 | Plate, R32L / R32N21 / R32N18.5 Hot-dipped Galvanization | pcs |
| 100100735 | Plate, R32L / R32N21 / R32N18.5 Double Coated | pcs |
| 100087081 | Plate, R32S / R32SS | pcs |
| 100100736 | Plate, R32S / R32SS Hot-dipped Galvanization | pcs |
| 100100464 | Plate, R32S / R32SS Double Coated | pcs |
| 100099081 | Guide, R32 | pcs |
| 100099075 | Adapter, Drill Bit Adapter R32-R38 | pcs |
| 100100737 | Adapter, Drill Bit Adapter R32-R51 | pcs |
| 100100738 | Adapter, Drill Bit Adapter R32-T40 | pcs |
| 100100739 | Adapter, Drill Bit Adapter R32-T52 | pcs |
| 100100740 | Drill Bit, R32 EX D51 | pcs |
| 100100741 | Drill Bit, R32 EX D90 | pcs |
| 100100742 | Drill Bit, R32 EX D76 | pcs |
| 100087030 | Drill Bit, R32 EXX D51 | pcs |
| 100100743 | Drill Bit, R32 EXX D76 | pcs |
| 100100744 | Drill Bit, R32 EXX D90 | pcs |
| 100100745 | Drill Bit, R32 ESF D51 | pcs |
| 100100746 | Drill Bit, R32 ESF D76 | pcs |
| 100087031 | Drill Bit, R32 ESSF D51 | pcs |
| 100100747 | Drill Bit, R32 ESSF D76 | pcs |
| 100100748 | Drill Bit, R32 ESSF D90 | pcs |

R38 SYSTEM

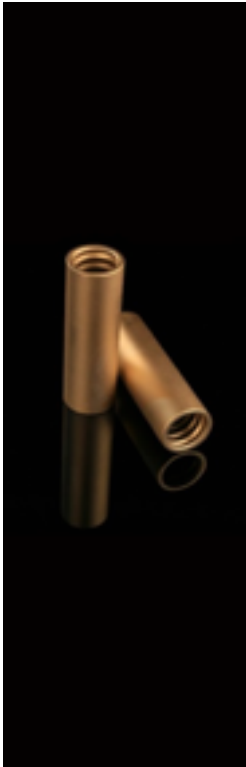


| Bar | R38N/21 | R38N/19 |
|---|--|---------|
| Outside Diameter (mm) | 38 | |
| Internal Diameter (mm) | 21 | 19 |
| Cross Sectional Area (mm ²) | 611 | 700 |
| Ultimate Load (kN) | 500 | 500 |
| Yield Load (kN) | 400 | 400 |
| Weight (kg/m) | 4.8 | 5.5 |
| Thread Type | ISO10208 | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

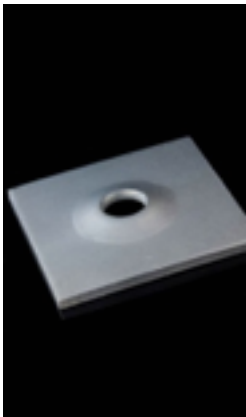


| Nut | R38N/21 | R38N/19 |
|----------------------------|---|---------|
| Key Size (mm) | 50 | |
| Length (mm) | 60 | |
| Hardness (HRC) | 25 - 30 (*) | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | ISO10208 | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 0.25 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

R38 SYSTEM



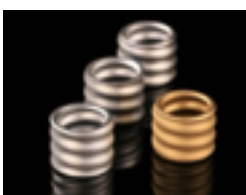
| Coupling | R38N/21 | R38N/19 |
|----------------------------|---|---------|
| Outside Diameter (mm) | 52 | |
| Length (mm) | 220 | |
| Hardness (HRC) | 23- 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | ISO10208 | |
| Type of Steel | EN10083-1 | |
| Unit Weight (kg) | 1.8 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Plate | R38N/21 | R38N/19 |
|----------------------------|--|---------|
| Size (mm) | 200 x 200 | |
| Thickness (mm) | 12 | |
| Hole Diameter (mm) | 41 | |
| Unit Weight (kg) | 3.6 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Centralizer | R38N/21 | R38N/19 |
|-----------------------|---------|---------|
| Outside Diameter (mm) | 72 | |
| Length (mm) | 41 | |
| Hole Diameter (mm) | 50 | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 0.3 | |



| Drill Bit Adapter | R38 |
|-------------------|-----------------------|
| Anchor Bar Thread | R38 |
| Drill Bit Thread | R51 / T52 / T73 / T76 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.1 |

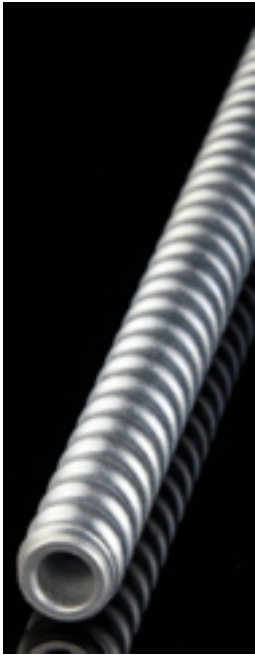
R38 SYSTEM

| Drill Bit | EX | EXX | ESF | ESSF |
|---|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D76 / 0.75 | D76 / 1.06 | D76 / 1.15 | D76 / 1.40 |
| | D90 / 1.55 | D90 / 1.80 | D90 / 1.54 | D90 / 1.85 |
| | D100 / 1.80 | D100 / 1.90 | D100 / 2.00 | D100 / 2.70 |
| | | | | D115 / 3.60 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | ISO 10208 | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item number | Item Description | Unit of Measure |
|-------------|---|-----------------|
| 100100749 | Bar, R38N/21 | m |
| 100100750 | Bar, R38N/21 Hot-dipped Galvanization | m |
| 100100751 | Bar, R38N/21 Double Coated | m |
| 100100752 | Bar, R38N/19 | m |
| 100100753 | Bar, R38N/19 Hot-dipped Galvanization | m |
| 100100754 | Bar, R38N/19 Double Coated | m |
| 100100755 | Nut, R38N/21 | pcs |
| 100100756 | Nut, R38N/21 Hot-dipped Galvanization | pcs |
| 100100757 | Nut, R38N/21 Double Coated | pcs |
| 100100758 | Nut, R38N/19 | pcs |
| 100100759 | Nut, R38N/19 Hot-dipped Galvanization | pcs |
| 100100760 | Nut, R38N/19 Double Coated | pcs |
| 100100761 | Coupler, R38N21 / R38N19 | pcs |
| 100100762 | Coupler, R38N21 / R38N19 Hot-dipped Galvanization | pcs |
| 100100763 | Coupler, R38N21 / R38N19 Double Coated | pcs |
| 100100764 | Plate, R38N21 / R38N19 | pcs |
| 100100765 | Plate, R38N21 / R38N19 Hot-dipped Galvanization | pcs |

| Item number | Item Description | Unit of Measure |
|-------------|--------------------------------------|-----------------|
| 100100766 | Plate, R38N21 / R38N19 Double Coated | pcs |
| 100099082 | Guide, R38 | pcs |
| 100099076 | Adapter, Drill Bit Adapter R38 – R51 | pcs |
| 100100767 | Adapter, Drill Bit Adapter R38 – T52 | pcs |
| 100100768 | Adapter, Drill Bit Adapter R38 – T73 | pcs |
| 100100769 | Adapter, Drill Bit Adapter R38 – T76 | pcs |
| 100100770 | Drill Bit, R38 EX D76 | pcs |
| 100100771 | Drill Bit, R38 EX D90 | pcs |
| 100100772 | Drill Bit, R38 EX D100 | pcs |
| 100100773 | Drill Bit, R38 EXX D76 | pcs |
| 100100774 | Drill Bit, R38 EXX D90 | pcs |
| 100100775 | Drill Bit, R38 EXX D100 | pcs |
| 100100776 | Drill Bit, R38 ESF D76 | pcs |
| 100100777 | Drill Bit, R38 ESF D90 | pcs |
| 100100778 | Drill Bit, R38 ESF D100 | pcs |
| 100100779 | Drill Bit, R38 ESSF D76 | pcs |
| 100100780 | Drill Bit, R38 ESSF D90 | pcs |
| 100100781 | Drill Bit, R38 ESSF D100 | pcs |
| 100100782 | Drill Bit, R38 ESSF D115 | Pcs |

R51 SYSTEM

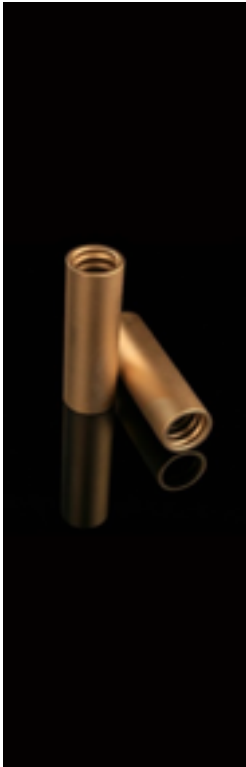


| Bar | R51L | R51N |
|---|--|------|
| Outside Diameter (mm) | 51 | |
| Internal Diameter (mm) | 36 | 33 |
| Cross Sectional Area (mm ²) | 713 | 993 |
| Ultimate Load (kN) | 550 | 800 |
| Yield Load (kN) | 450 | 630 |
| Weight (kg/m) | 6.3 | 7.8 |
| Thread Type | ISO10208 | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

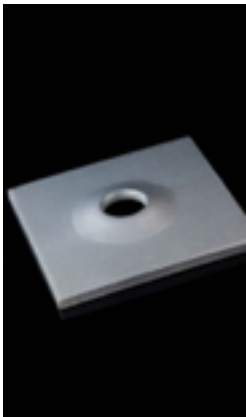


| Nut | R51L | R51N |
|----------------------------|---|------|
| Key Size (mm) | 75 | |
| Length (mm) | 70 | |
| Hardness (HRC) | 25 - 30 (*) | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | ISO10208 | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 1.5 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

R51 SYSTEM



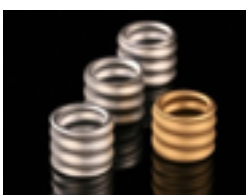
| Coupling | R51L | R51N |
|----------------------------|--|------|
| Outside Diameter (mm) | 63 | |
| Length (mm) | 140 | 200 |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | ISO10208 | |
| Type of Steel | EN10083-1 | |
| Unit Weight (kg) | 1.26 | 1.9 |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Plate | R51L | R51N |
|----------------------------|--|-----------|
| Size (mm) | 200 x 200 | 250 x 250 |
| Thickness (mm) | 30 | 40 |
| Hole Diameter (mm) | 60 | |
| Unit Weight (kg) | 8.8 kg | 18.5 kg |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Centralizer | R51L | R51N |
|-----------------------|------|------|
| Outside Diameter (mm) | 90 | |
| Length (mm) | 54 | |
| Hole Diameter (mm) | 60 | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 0.36 | |



| Drill Bit Adapter | R51 |
|-------------------|-----------|
| Anchor Bar Thread | R51 |
| Drill Bit Thread | T73 / T76 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.2 |

R51 SYSTEM

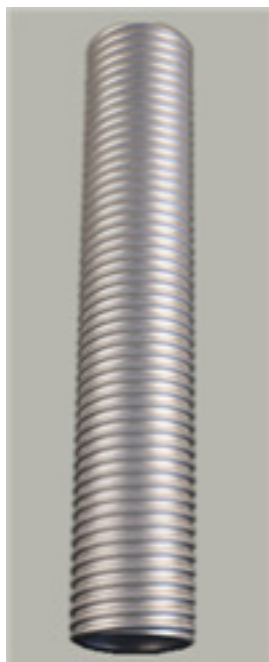
SDA System
Technical Data Sheet

| Drill Bit | EX | EXX | ESF | ESSF |
|---|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D90 / 1.60 | D90 / 1.75 | D90 / 1.35 (ESF) | D90 / 1.90 |
| | D115 / 2.50 | D100 / 2.50 | D100 / 1.50 (ESF) | D100 / 2.40 |
| | | D115 / 2.80 | D115 / 2.10 (ESD) | D115 / 3.50 |
| | | D130 / 4.00 | | D130 / 5.00 |
| | | D150 / 5.50 | | D150 / 6.20 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | ISO 10208 | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item Number | Item Description | Unit of Measure |
|-------------|---|-----------------|
| 100100783 | Bar, R51L | m |
| 100100784 | Bar, R51L Hot-dipped Galvanization | m |
| 100100785 | Bar, R51L Double Coated | m |
| 100100786 | Bar, R51N | m |
| 100100787 | Bar, R51N Hot-dipped Galvanization | m |
| 100100788 | Bar, R51N Double Coated | m |
| 100100789 | Nut, R51L / R51N | pcs |
| 100100790 | Nut, R51L / R51N Hot-dipped Galvanization | pcs |
| 100100791 | Nut, R51L / R51N Double Coated | pcs |
| 100100792 | Coupler, R51L | pcs |
| 100100793 | Coupler, R51L Hot-dipped Galvanization | pcs |
| 100100794 | Coupler, R51L Double Coated | pcs |
| 100100795 | Coupler, R51N | pcs |
| 100100796 | Coupler, R51N Hot-dipped Galvanization | pcs |
| 100100797 | Coupler, R51N Double Coated | pcs |
| 100100798 | Plate, R51L / R51N | pcs |
| 100100799 | Plate, R51L / R51N Hot-dipped Galvanization | pcs |

| Item Number | Item Description | Unit of Measure |
|-------------|------------------------------------|-----------------|
| 100100800 | Plate, R51L / R51N Double Coated | pcs |
| 100100801 | Guide, R51 | pcs |
| 100100802 | Adapter, Drill Bit Adapter R51-T73 | pcs |
| 100100803 | Adapter, Drill Bit Adapter R51-T76 | pcs |
| 100100804 | Drill Bit, R51 EX D90 | pcs |
| 100100805 | Drill Bit, R51 EX D115 | pcs |
| 100100806 | Drill Bit, R51 EXX D90 | pcs |
| 100100807 | Drill Bit, R51 EXX D100 | pcs |
| 100100808 | Drill Bit, R51 EXX D115 | pcs |
| 100100809 | Drill Bit, R51 EXX D130 | pcs |
| 100100810 | Drill Bit, R51 EXX D150 | pcs |
| 100100811 | Drill Bit, R51 ESF D90 | pcs |
| 100100812 | Drill Bit, R51 ESF D100 | pcs |
| 100100813 | Drill Bit, R51 ESF D115 | pcs |
| 100100814 | Drill Bit, R51 ESSF D90 | pcs |
| 100100815 | Drill Bit, R51 ESSF D100 | pcs |
| 100100816 | Drill Bit, R51 ESSF D115 | pcs |
| 100100817 | Drill Bit, R51 ESSF D130 | pcs |
| 100100818 | Drill Bit, R51 ESSF D150 | pcs |

T30 SYSTEM



| Bar | T30/16 | T30/14 | T30/11 |
|---|--|--------|--------|
| Outside Diameter (mm) | 30 | | |
| Internal Diameter (mm) | 16 | 14 | 11 |
| Cross Sectional Area (mm ²) | 343 | 356 | 406 |
| Ultimate Load (kN) | 220 | 260 | 320 |
| Yield Load (kN) | 180 | 220 | 260 |
| Weight (kg/m) | 2.7 | 2.8 | 3.25 |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | EN10083-1 | | |
| Thread (Left / Right hand) | Left or Right | | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | |

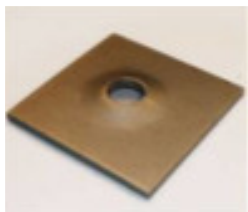


| Nut | T30/16 | T30/14 | T30/11 |
|----------------------------|--|--------|--------|
| Key Size (mm) | 46 | | |
| Length (mm) | 35 | | |
| Hardness (HRC) | 25 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | CK45 | | |
| Unit Weight (kg) | 0.36 | | |
| Thread (Left / Right hand) | Left or Right | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | |

T30 SYSTEM



| Coupling | T30/16 | T30/14 | T30/11 |
|----------------------------|---|--------|--------|
| Outside Diameter (mm) | 38 | | |
| Length (mm) | 105 | | |
| Hardness (HRC) | 23 - 30 (*) | | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | EN10083-1 | | |
| Unit Weight (kg) | 0.42 | | |
| Thread (Left / Right hand) | Left or Right | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | |



| Plate | T30/16 | T30/14 | T30/11 |
|----------------------------|--|--------|--------|
| Size (mm) | 200 x 200 | | |
| Thickness (mm) | 8 | | |
| Hole Diameter (mm) | 36 | | |
| Unit Weight (kg) | 2.46 | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | |



| Centralizer | T30 |
|-----------------------|------|
| Outside Diameter (mm) | 88 |
| Length (mm) | 37 |
| Hole Diameter (mm) | 36 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 0.27 |



| Drill Bit Adapter | T30 |
|-------------------|-----------|
| Anchor Bar Thread | T30 |
| Drill Bit Thread | R38 / T40 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.1 |

T30 SYSTEM

| Drill Bit | EX | EXX | ESF | ESSF |
|---|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D42 / 0.30 | D42 / 0.30 | D42 / 0.30 | |
| | D46 / 0.32 | D46 / 0.32 | D46 / 0.32 | D46 / 0.45 |
| | D51 / 0.40 | D51 / 0.40 | D51 / 0.69 | D51 / 0.69 |
| | D76 / 0.56 | | | |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item Number | Item Description | Unit of Measure |
|-------------|--|-----------------|
| 100100819 | Bar, T30/16 | m |
| 100100820 | Bar, T30/16 Hot-dipper Galvanization | m |
| 100100821 | Bar, T30/16 Double Coated | m |
| 100100822 | Bar, T30/14 | m |
| 100100823 | Bar, T30/14 Hot-dipped Galvanization | m |
| 100100824 | Bar, T30/14 Double Coated | m |
| 100100825 | Bar, T30/11 | m |
| 100100826 | Bar, T30/11 Hot-dipped Galvanization | m |
| 100100827 | Bar, T30/11 Double Coated | m |
| 100100828 | Nut, T30/16/14/11 | pcs |
| 100100829 | Nut, T30/16/14/11 Hot-dipped Galvanization | pcs |
| 100100830 | Nut, T30/16/14/11 Double Coated | pcs |
| 100100831 | Coupler, T30 | pcs |
| 100100832 | Coupler, T30 Hot-dipped Galvanization | pcs |
| 100100833 | Coupler, T30 Double Coated | pcs |

| Item Number | Item Description | Unit of Measure |
|-------------|-------------------------------------|-----------------|
| 100100834 | Plate, T30 | pcs |
| 100100835 | Plate, T30 Hot-dipped Galvanization | pcs |
| 100100836 | Plate, T30 Double Coated | pcs |
| 100100837 | Guide, T30 | pcs |
| 100100838 | Adapter, Drill Bit Adapter T30-R38 | pcs |
| 100099077 | Adapter, Drill Bit Adapter T30-T40 | pcs |
| 100100839 | Drill Bit, T30 EX D42 | pcs |
| 100100840 | Drill Bit, T30 EX D46 | pcs |
| 100100841 | Drill Bit, T30 EX D51 | pcs |
| 100100842 | Drill Bit, T30 EX D76 | pcs |
| 100100843 | Drill Bit, T30 EXX D42 | pcs |
| 100100844 | Drill Bit, T30 EXX D46 | pcs |
| 100100845 | Drill Bit, T30 EXX D51 | pcs |
| 100100846 | Drill Bit, T30 ESF D42 | pcs |
| 100100847 | Drill Bit, T30 ESF D46 | pcs |
| 100100848 | Drill Bit, T30 ESF D51 | pcs |
| 100100849 | Drill Bit, T30 ESSF D46 | pcs |
| 100100850 | Drill Bit, T30 ESSF D51 | pcs |

T40 SYSTEM



| Bar | T40/20 | T40/16 |
|---|--|--------|
| Outside Diameter (mm) | 40 | |
| Internal Diameter (mm) | 20 | 16 |
| Cross Sectional Area (mm ²) | 713 | 910 |
| Ultimate Load (kN) | 540 | 660 |
| Yield Load (kN) | 430 | 520 |
| Weight (kg/m) | 5.6 | 7.15 |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

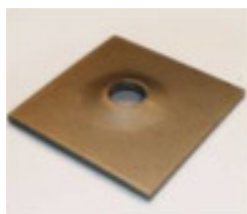


| Nut | T40/20 | T40/16 |
|----------------------------|---|--------|
| Key Size (mm) | 65 | |
| Length (mm) | 50 | |
| Hardness (HRC) | 25 - 30 (*) | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 0.85 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

T40 SYSTEM



| Coupling | T40/20 | T40/16 |
|----------------------------|---|--------|
| Outside Diameter (mm) | 54 | 57 |
| Length (mm) | 140 | |
| Hardness (HRC) | 23 - 30 (*) | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Unit Weight (kg) | 1.15 | 1.54 |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Plate | T40/20 | T40/16 |
|----------------------------|--|--------|
| Size (mm) | 200 x 200 | |
| Thickness (mm) | 12 | 15 |
| Hole Diameter (mm) | 54 | |
| Unit Weight (kg) | 3.5 | 4.58 |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Centralizer | T40 |
|-----------------------|------|
| Outside Diameter (mm) | 88 |
| Length (mm) | 40 |
| Hole Diameter (mm) | 52 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 0.4 |



| Drill Bit Adapter | T40 |
|-------------------|-----------------------|
| Anchor Bar Thread | T40 |
| Drill Bit Thread | R51 / T52 / T73 / T76 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.2 |

T40 SYSTEM

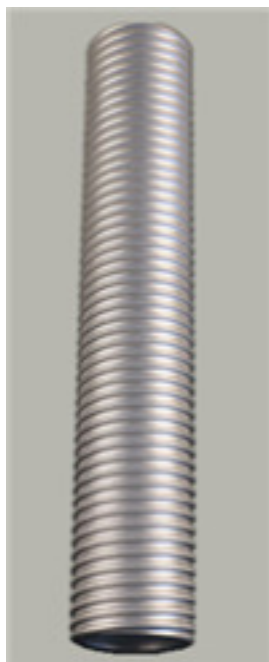
SDA System
Technical Data Sheet

| Drill Bit | EX | EXX | ESF | ESSF |
|--|--|---|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | Hardened button bit for unconsolidated rock with boulders | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D76 / 0.90 | D76 / 1.20 | D42 / 0.30 | D76 / 1.78 |
| | D90 / 1.50 | D90 / 1.75 | D46 / 0.32 | D90 / 1.40 |
| | D100 / 1.65 | D100 / 2.00 | D51 / 0.69 | D100 / 1.85 |
| | D115 / 2.60 | D115 / 2.80 | | D115 / 2.00 |
| | | D130 / 3.10 | | D130 / 2.80 |
| | | D150 / 5.00 | | D150 / 3.10 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 50 - 55 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |

| Item Number | Item Description | Unit of Measure |
|-------------|---|-----------------|
| 100100851 | Bar, T40/20 | m |
| 100100852 | Bar, T40/20 Hot-dipped Galvanization | m |
| 100100853 | Bar, T40/20 Double Coated | m |
| 100100854 | Bar, T40/16 | m |
| 100100855 | Bar, T40/16 Hot-dipped Galvanization | m |
| 100100856 | Bar, T40/16 Double Coated | m |
| 100100857 | Nut, T40 | pcs |
| 100100858 | Nut, T40 Hot-dipped Galvanization | pcs |
| 100100859 | Nut, T40 Double Coated | pcs |
| 100100860 | Coupler, T40/20 | pcs |
| 100100919 | Coupler T40/20 Hot Dipped Galvanization | pcs |
| 100100862 | Coupler T40/20 Double Coated | pcs |
| 100100863 | Coupler T40/16 | pcs |
| 100100864 | Coupler T40/16 Hot-dipped Galvanization | pcs |
| 100100865 | Coupler T40/16 Double Coated | pcs |
| 100100866 | Plate, T40/20 | pcs |
| 100100867 | Plate, T40/20 Hot-dipped Galvanization | pcs |
| 100100868 | Plate, T40/20 Double Coated | pcs |
| 100100869 | Plate, T40/16 | pcs |
| 100100870 | Plate, T40/16 Hot-dipped Galvanization | pcs |

| | | |
|-----------|------------------------------------|-----|
| 100100871 | Plate, T40/16 Double Coated | pcs |
| 100099083 | Guide, T40 | pcs |
| 100100872 | Adapter, Drill Bit Adapter T40-R51 | pcs |
| 100099078 | Adapter, Drill Bit Adapter T40-T52 | pcs |
| 100099079 | Adapter, Drill Bit Adapter T40-T73 | pcs |
| 100100874 | Drill Bit, T40 EX D76 | pcs |
| 100100875 | Drill Bit, T40 EX D90 | pcs |
| 100100876 | Drill Bit, T40 EX D100 | pcs |
| 100100877 | Drill Bit, T40 EX D115 | pcs |
| 100100878 | Drill Bit, T40 EXX D76 | pcs |
| 100100879 | Drill Bit, T40 EXX D90 | pcs |
| 100100880 | Drill Bit, T40 EXX D100 | pcs |
| 100100881 | Drill Bit, T40 EXX D115 | pcs |
| 100100882 | Drill Bit, T40 EXX D130 | pcs |
| 100100883 | Drill Bit, T40 EXX D150 | pcs |
| 100100884 | Drill Bit, T40 ESF D42 | pcs |
| 100100885 | Drill Bit, T40 ESF D46 | pcs |
| 100100886 | Drill Bit, T40 ESF D51 | pcs |
| 100100887 | Drill Bit, T40 ESSF D70 | pcs |
| 100100888 | Drill Bit, T40 ESSF D76 | pcs |
| 100100889 | Drill Bit, T40 ESSF D90 | pcs |
| 100100890 | Drill Bit, T40 ESSF D100 | pcs |
| 100100891 | Drill Bit, T40 ESSF D115 | pcs |
| 100100892 | Drill Bit, T40 ESSF D130 | pcs |

T52 SYSTEM



| Bar | T52/26 |
|---|--|
| Outside Diameter (mm) | 52 |
| Internal Diameter (mm) | 26 |
| Cross Sectional Area (mm ²) | 1250 |
| Ultimate Load (kN) | 929 |
| Yield Load (kN) | 730 |
| Weight (kg/m) | 9.9 |
| Thread Type | Industry standard trapezoidal thread |
| Type of Steel | EN10083-1 |
| Thread (Left / Right hand) | Left or Right |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

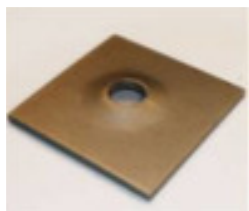


| Nut | T52/26 |
|----------------------------|--|
| Key Size (mm) | 80 |
| Length (mm) | 70 |
| Hardness (HRC) | 25 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. |
| Thread Type | Industry standard trapezoidal thread |
| Type of Steel | CK45 |
| Unit Weight (kg) | 2.35 |
| Thread (Left / Right hand) | Left or Right |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |

T52 SYSTEM



| Coupling | T52/26 |
|----------------------------|--|
| Outside Diameter (mm) | 70 |
| Length (mm) | 160 |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. |
| Thread Type | Industry standard trapezoidal thread |
| Type of Steel | EN10083-1 |
| Unit Weight (kg) | 2.3 |
| Thread (Left / Right hand) | Left or Right |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 |



| Plate | T52/26 |
|--------------------|-----------|
| Size (mm) | 220 x 220 |
| Thickness (mm) | 35 |
| Hole Diameter (mm) | 65 |
| Unit Weight (kg) | 12.1 |



| Centralizer | T52 |
|-----------------------|------|
| Outside Diameter (mm) | 112 |
| Length (mm) | 70 |
| Hole Diameter (mm) | 68 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 1.2 |



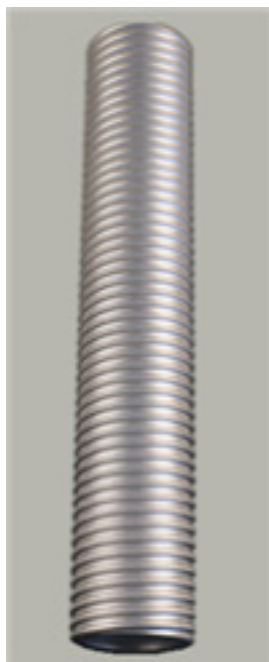
| Drill Bit Adapter | T52 |
|-------------------|-----------|
| Anchor Bar Thread | T52 |
| Drill Bit Thread | T73 / T76 |
| Length (mm) | 50 |
| Unit Weight (kg) | 0.6 |

T52 SYSTEM

| Drill Bit | EX | EXX | ESSF |
|---|--|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D115 / 2.60 | D115 / 2.60 | D100 / 2.00 |
| | | D130 / 2.80 | D115 / 2.80 |
| | | D150 / 4.50 | |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | EN10083-1 | | |
| Thread (Left / Right hand) | Left or Right | | |

| Item Number | Item Description | Unit of measure |
|-------------|--|-----------------|
| 100099101 | Bar, T52/26 | m |
| 100100893 | Bar, T52/26 Hot-dipped Galvanization | m |
| 100100198 | Bar, T52/26 Double Coated | m |
| 100099106 | Nut, T52/26 | pcs |
| 100100894 | Nut, T52/26 Hot-dipped Galvanization | pcs |
| 100100200 | Nut, T52/26 Double Coated | pcs |
| 100099104 | Coupler, T52/26 | pcs |
| 100100895 | Coupler, T52/26 Hot-dipped Galvanization | pcs |
| 100100192 | Coupler, T52/26 Double Coated | pcs |
| 100087088 | Plate, T52/26 | pcs |
| 100100896 | Plate, T52/26 Hot-dipped Galvanization | pcs |
| 100100203 | Plate, T52/26 Double Coated | pcs |
| 100099085 | Guide, T52/26 | pcs |
| 100099080 | Adapter, Drill Bit Adapter T52/26-T73 | pcs |
| 100100897 | Adapter, Drill Bit Adapter T52/26-T76 | pcs |
| 100087033 | Drill Bit, T52 EX D100 | pcs |
| 100100898 | Drill Bit, T52 EX D115 | pcs |
| 100100899 | Drill Bit, T52 EXX D115 | pcs |
| 100100900 | Drill Bit, T52 EXX D130 | pcs |
| 100100901 | Drill Bit, T52 EXX D150 | pcs |
| 100100190 | Drill Bit, T52 ESSF D90 | pcs |
| 100100902 | Drill Bit, T52 ESSF D100 | pcs |
| 100100903 | Drill Bit, T52 ESSF D115 | pcs |

T73 SYSTEM



| Bar | T73/53 | T73/56 | T73/45 | T73/35 |
|---|--|--------|--------|--------|
| Outside Diameter (mm) | 73 | | | |
| Internal Diameter (mm) | 53 | 56 | 45 | 35 |
| Cross Sectional Area (mm ²) | 1680 | 1369 | 2267 | 2700 |
| Ultimate Load (kN) | 1160 | 1035 | 1575 | 1865 |
| Yield Load (kN) | 970 | 830 | 1270 | 1430 |
| Weight (kg/m) | 13.2 | 10.75 | 17.8 | 21.2 |
| Thread Type | Industry standard trapezoidal thread | | | |
| Type of Steel | EN10083-1 | | | |
| Thread (Left / Right hand) | Left or Right | | | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | |

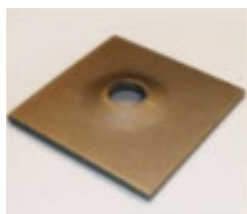


| Nut | T73/53 | T73/56 | T73/45 | T73/35 |
|----------------------------|--|--------|--------|--------|
| Key Size (mm) | 95 | | | |
| Length (mm) | 70 | | | |
| Hardness (HRC) | 25 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | | |
| Thread Type | Industry standard trapezoidal thread | | | |
| Type of Steel | CK45 | | | |
| Unit Weight (kg) | 2.2 | | | |
| Thread (Left / Right hand) | Left or Right | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | |

T73 SYSTEM



| Coupling | T73/53 | T73/56 | T73/45 | T73/35 |
|----------------------------|--|--------|--------|--------|
| Outside Diameter (mm) | 95 | | | |
| Length (mm) | 235 | | | |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | | | |
| Thread Type | Industry standard trapezoidal thread | | | |
| Type of Steel | EN10083-1 | | | |
| Unit Weight (kg) | 4.3 | | | |
| Thread (Left / Right hand) | Left or Right | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | |



| Plate | T73/53 | T73/56 | T73/45 | T73/35 |
|----------------------------|--|--------|--------|--------|
| Size (mm) | 250 x 250 | | | |
| Thickness (mm) | 40 | | | |
| Hole Diameter (mm) | 80 | | | |
| Unit Weight (kg) | 18 | | | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | | | |



| Centralizer | T73 |
|-----------------------|------|
| Outside Diameter (mm) | 130 |
| Length (mm) | 80 |
| Hole Diameter (mm) | 87 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 1.2 |



| Drill Bit Adapter | T73 |
|-------------------|------|
| Anchor Bar Thread | T73 |
| Drill Bit Thread | T103 |
| Length (mm) | 50 |
| Unit Weight (kg) | 1.3 |

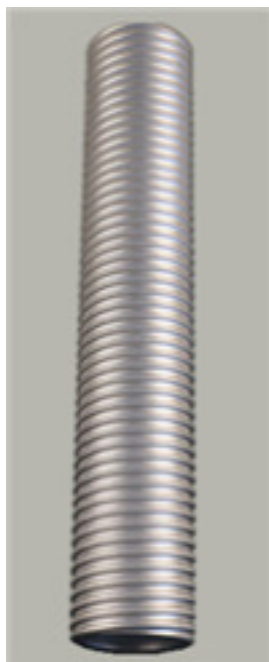
T73 SYSTEM

| Drill Bit | EX | EXX | ESSF |
|---|--|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D130 / 2.60 | D130 / 4.20 | D100 / 3.85 |
| | D170 / 5.50 | D150 / 5.70 | D130 / 6.90 |
| | | D200 / 10.00 | |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | EN10083-1 | | |
| Thread (Left / Right hand) | Left or Right | | |

| Item Number | Item Description | Unit of Measure |
|-------------|--------------------------------------|-----------------|
| 100100904 | Bar, T73/53 | m |
| 100100905 | Bar, T73/53 Hot-dipped Galvanization | m |
| 100100906 | Bar, T73/53 Double Coated | m |
| 100100907 | Bar, T73/56 | m |
| 100100908 | Bar, T73/56 Hot-dipped Galvanization | m |
| 100100909 | Bar, T73/56 Double Coated | m |
| 100100910 | Bar, T73/45 | m |
| 100100911 | Bar, T73/45 Hot-dipped Galvanization | m |
| 100100912 | Bar, T73/45 Double Coated | m |
| 100100913 | Bar, T73/35 | m |
| 100100914 | Bar, T73/35 Hot-dipped Galvanization | m |
| 100100915 | Bar, T73/35 Double Coated | m |
| 100100916 | Nut, T73 | pcs |
| 100100917 | Nut, T73 Hot-dipped Galvanization | pcs |
| 100100475 | Nut, T73 Double Coated | pcs |

| Item Number | Item Description | Unit of Measure |
|-------------|--|-----------------|
| 100100918 | Coupler, T73 | pcs |
| 100100919 | Coupler, T40/20 Hot-dipped Galvanization | pcs |
| 100100476 | Coupler, T40/20 Double Coated | pcs |
| 100100920 | Plate, T73 | pcs |
| 100100921 | Plate, T73 Hot-dipped Galvanization | pcs |
| 100100477 | Plate, T73 Double Coated | pcs |
| 100099086 | Guide, T73 | pcs |
| 100100922 | Adapter, Drill Bit Adapter T73-T103 | pcs |
| 100100923 | Drill Bit, T73 EX D130 | pcs |
| 100100924 | Drill Bit, T73 EX D170 | pcs |
| 100100925 | Drill Bit, T73 EXX D130 | pcs |
| 100100926 | Drill Bit, T73 EXX D150 | pcs |
| 100100927 | Drill Bit, T73 EXX D200 | pcs |
| 100100928 | Drill Bit, T73 ESSF D100 | pcs |
| 100100929 | Drill Bit, T73 ESSF D130 | pcs |

T76 SYSTEM



| Bar | T76N | T76S |
|---|--|------|
| Outside Diameter (mm) | 76 | |
| Internal Diameter (mm) | 51 | 47 |
| Cross Sectional Area (mm ²) | 2000 | 2400 |
| Ultimate Load (kN) | 1600 | 1900 |
| Yield Load (kN) | 1200 | 1500 |
| Weight (kg/m) | 16.5 | 19 |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

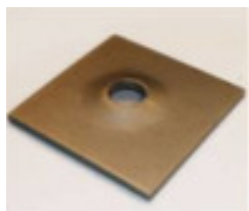


| Nut | T76N | T76S |
|----------------------------|--|------|
| Key size (mm) | 100 | |
| Length (mm) | 80 | |
| Hardness (HRC) | 25 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 2.66 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

T76 SYSTEM



| Coupling | T76N | T76S |
|----------------------------|--|------|
| Outside Diameter (mm) | 95 | 97 |
| Length (mm) | 200 | 220 |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Unit Weight (kg) | 4.3 | 5.35 |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



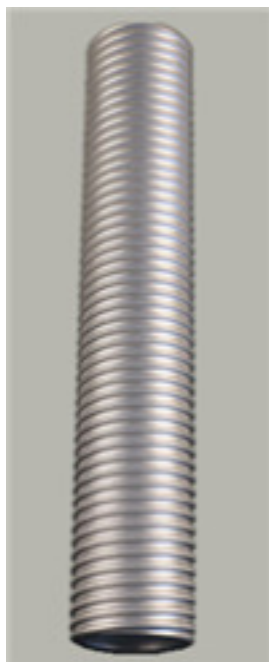
| Plate | T76N | T76S |
|----------------------------|--|------|
| Size (mm) | 250 x 250 | |
| Thickness (mm) | 40 | |
| Hole Diameter (mm) | 80 | |
| Unit Weight (kg) | 19.1 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

T76 SYSTEM

| Drill Bit | EX | EXX | ESSF |
|---|--|---|--|
| | Hardened cross bit for loose to medium dense ground conditions | TC cross bit for soft to medium rock formations | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D130 / 3.30 | D130 / 4.60 | D120 / 3.65 |
| | D170 / 5.50 | D150 / 5.70 | D130 / 6.30 |
| | | D200 / 10.00 | D150 / 6.60 |
| Hardness (HRC/HRA) | 50 - 55 | 87 - 89 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | | |
| Type of Steel | EN10083-1 | | |
| Thread (Left / Right hand) | Left or Right | | |

| Item Number | Item Description | Unit of Measure |
|-------------|--|-----------------|
| 100100930 | Bar, T76N | m |
| 100100931 | Bar, T76N Hot-dipped Galvanization | m |
| 100100932 | Bar, T76N Double Coated | m |
| 100100933 | Bar, T76S | m |
| 100100934 | Bar, T76S Hot-dipped Galvanization | m |
| 100100935 | Bar, T76S Double Coated | m |
| 100100936 | Nut, T76 | pcs |
| 100100937 | Nut, T76 Hot-dipped Galvanization | pcs |
| 100100938 | Nut, T76 Double Coated | pcs |
| 100100939 | Coupler, T76N | pcs |
| 100100940 | Coupler, T76N Hot-dipped Galvanization | pcs |
| 100100941 | Coupler, T76N Double Coated | pcs |
| 100100942 | Coupler T76S | pcs |
| 100100943 | Coupler, T76S Hot-dipped Galvanization | pcs |
| 100100944 | Coupler, T76S Double Coated | pcs |
| 100100945 | Plate, T76 | pcs |
| 100100946 | Plate, T76 Hot-dipped Galvanization | pcs |
| 100100947 | Plate, T76 Double Coated | pcs |
| 100100948 | Drill Bit, T76 EX D130 | pcs |
| 100100949 | Drill Bit, T76 EX D170 | pcs |
| 100100950 | Drill Bit, T76 EXX D130 | pcs |
| 100100951 | Drill Bit, T76 EXX D150 | pcs |
| 100100952 | Drill Bit, T76 EXX D200 | pcs |
| 100100953 | Drill Bit, T76 ESSF D120 | pcs |
| 100100954 | Drill Bit, T76 ESSF D130 | pcs |
| 100100955 | Drill Bit, T76 ESSF D150 | pcs |

T103 SYSTEM



| Bar | T103/78 | T103/51 |
|---|--|---------|
| Outside Diameter (mm) | 103 | |
| Internal Diameter (mm) | 78 | 51 |
| Cross Sectional Area (mm ²) | 3220 | 5680 |
| Ultimate Load (kN) | 2280 | 3460 |
| Yield Load (kN) | 1800 | 2730 |
| Weight (kg/m) | 25.3 | 44.6 |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |
| Length (m) | (1) x 2, x3, x4, x5, x6, x7, x8, x9 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

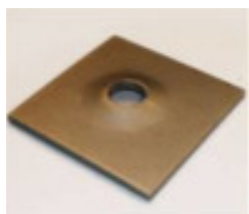


| Nut | T103/78 | T103/51 |
|----------------------------|---|---------|
| Key size (mm) | 125 | |
| Length (mm) | 80 | |
| Hardness (HRC) | 25 - 30 (*) | |
| | *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | CK45 | |
| Unit Weight (kg) | 3.42 | |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |

T103 SYSTEM



| Coupling | T103/78 | T103/51 |
|----------------------------|--|---------|
| Outside Diameter (mm) | 123 | 132 |
| Length (mm) | 255 | 290 |
| Hardness (HRC) | 23 - 30 (*) *In a certain range, tensile strength increase in proportion to hardness. For couplers and nuts, it's important to make sure the fitting capacity reaches bar's capacity. Through hundreds of rounds of testing, a lab standard is set up which is HRC 23 - 30 for couplers and HRC 25 - 30 for nuts. | |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Unit Weight (kg) | 7.4 | 12.5 |
| Thread (Left / Right hand) | Left or Right | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Plate | T103/78 | T103/51 |
|----------------------------|--|---------|
| Size (mm) | 300 x 300 | |
| Thickness (mm) | 50 | |
| Hole Diameter (mm) | 110 | |
| Unit Weight (kg) | 32.6 | |
| Optional of Anti-corrosion | Hot-dipped Galvanization: ISO 1461 Epoxy Coating Bending properties up to standard ISO 1519 Impact properties up to standard ASTM D 2794 Adhesion up to standard ISO 2409:2007 | |



| Centralizer | T103 |
|-----------------------|------|
| Outside Diameter (mm) | 165 |
| Length (mm) | 80 |
| Hole Diameter (mm) | 110 |
| Type of Steel | CK45 |
| Unit Weight (kg) | 2.93 |

T103 SYSTEM

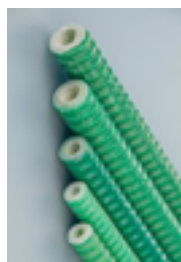
SDA System
Technical Data Sheet

| Drill bit | EXX | ESSF |
|---|---|--|
| | TC cross bit for soft to medium rock formations | TC button bit for medium rock formations |
| Outside Diameter (mm) / Unit Weight (kg) | D130 / 4.60 | D120 / 3.65 |
| | D150 / 5.70 | D130 / 6.30 |
| | D200 / 10.00 | D150 / 6.60 |
| Hardness (HRC/HRA) | 87 - 89 | 87 - 89 |
| Thread Type | Industry standard trapezoidal thread | |
| Type of Steel | EN10083-1 | |
| Thread (Left / Right hand) | Left or Right | |

| Item Number | Item Description | Unit of Measure |
|-------------|---|-----------------|
| 100100956 | Bar, T103/78 | m |
| 100100957 | Bar, T103/78 Hot-dipped Galvanization | m |
| 100100958 | Bar, T103/78 Double Coated | m |
| 100100959 | Bar, T103/51 | m |
| 100100960 | Bar, T103/51 Hot-dipped Galvanization | m |
| 100100961 | Bar, T103/51 Double Coated | m |
| 100100962 | Nut, T103 | pcs |
| 100100963 | Nut, T103 Hot-dipped Galvanization | pcs |
| 100100964 | Nut, T103 Double Coated | pcs |
| 100100965 | Coupler, T103/78 | pcs |
| 100100966 | Coupler, T103/78 Hot-dipped Galvanization | pcs |
| 100100967 | Coupler, T103/78 Double Coated | pcs |
| 100100968 | Coupler, T103/51 | pcs |
| 100100969 | Coupler, T103/51 Hot-dipped Galvanization | pcs |
| 100100970 | Coupler, T103/51 Double Coated | pcs |
| 100100971 | Plate, T103 | pcs |
| 100100972 | Plate, T103 Hot-dipped Galvanization | pcs |
| 100100973 | Plate T103 Double Coated | pcs |
| 100099088 | Guide, T103 | pcs |
| 100100974 | Drill Bit, T103 EXX D120 | pcs |
| 100100975 | Drill Bit, T103 EXX D130 | pcs |
| 100100976 | Drill Bit, T103 EXX D150 | pcs |
| 100100977 | Drill Bit, T103 ESSF D130 | pcs |
| 100100978 | Drill Bit, T103 ESSF D150 | pcs |
| 100100979 | Drill Bit, T103 ESSF D200 | pcs |

SDA FRP SYSTEM

| SDA FRP | | H25S | H28S | H32S | H38S |
|---|------------------|---|------|------|------|
| Outside Diameter (mm) | | 25 | 28 | 32 | 38 |
| Internal Diameter (mm) | | 12 | 14 | 15 | 20 |
| Cross Sectional Area (mm ²) | | 295 | 369 | 521 | 692 |
| Ultimate Load (kN) 220280365550 | | 220 | 280 | 365 | 550 |
| Breaking Load | Steel Nut L=70mm | 140 | 150 | 230 | 280 |
| | FRP Nut L=70mm | 70 | 70 | 80 | 80 |
| Torsion Strength (Nm) | | 180 | 250 | 400 | 450 |
| Ultimate Strain | | 2.50% | | | |
| Bending E-Modulus (GPa) | | 45 | | | |
| 45 Weight (kg/m) | | 0.63 | 0.86 | 0.99 | 1.33 |
| Thread Type | | R25 | R28 | R32 | R38 |
| E-Glass | | 75% | | | |
| Thread (Left / Right Hand) | | Left or Right | | | |
| Length (m) | | (1) x2, x3, x4, x5, x6, x7, x8, x9, x10, x11, x12 | | | |



| Item Number | Item Description | Unit of Measure |
|-------------|------------------|-----------------|
| 100100980 | Bar, H25S | m |
| 100100981 | Bar, H28S | m |
| 100100982 | Bar, H32S | m |
| 100100983 | Bar, H38S | m |

FRP SOLID BOLT SYSTEM

| Solid Bolt | | S18/150 | S19/165 | S20/200 | S22/250 | S24/300 | S25/350 | S27/400 | S30/490 | S32/560 |
|---|----------------------|---|---------|---------|---------|---------|---------|---------|---------|---------|
| Outside Diameter (mm) | | 18 | 19 | 20 | 22 | 24 | 25 | 27 | 30 | 32 |
| Cross Sectional Area (mm ²) | | 196 | 227 | 249 | 308 | 373 | 408 | 483 | 607 | 697 |
| Ultimate Load (kN) | | 150 | 165 | 200 | 250 | 300 | 350 | 400 | 490 | 560 |
| Breaking Load | Steel Nut L=100mm | 70 | 80 | 80 | 80 | 100 | 180 | 200 | 200 | 320 |
| | FRP Nut L=70mm | 60 | 60 | 60 | 70 | 80 | 80 | 80 | 80 | 90 |
| Torsion Strength (Nm) | | 60 | 70 | 70 | 70 | 100 | 120 | 130 | 180 | 230 |
| Ultimate Strain | | 2.50% | | | | | | | | |
| Bending E-Modulus (GPa) | | 40 | | | | | | | | |
| Weight (kg/m) | | 0.42 | 0.45 | 0.56 | 0.69 | 0.76 | 0.9 | 1.04 | 1.3 | 1.45 |
| Length (m) | | (1) x2, x3, x4, x5, x6, x7, x8, x9, x10, x11, x12 | | | | | | | | |

| Item Number | Item Description | Unit of Measure |
|-------------|------------------|-----------------|
| 100100984 | Bar, S18/150 | m |
| 100100985 | Bar, S19/165 | m |
| 100100986 | Bar, S20/200 | m |
| 100100987 | Bar, S22/250 | m |
| 100100988 | Bar, S24/300 | m |
| 100100989 | Bar, S25/350 | m |
| 100100990 | Bar, S27/400 | m |
| 100100991 | Bar, S30/490 | m |
| 100100992 | Bar, S32/560 | m |



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Peru

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Finland
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Switzerland
United Kingdom

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Democratic Republic
of Congo
Ghana
South Africa
Zambia

MIDDLE EAST
Qatar
United Arab Emirates

EURASIA
Kazakhstan
Mongolia
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Subject to technical and design modifications without notice. Technical properties have been achieved under theoretical and normal conditions. Please consult the respective machine manual for all matters related to safety, operation and maintenance.

SDA V2