ARDEX CE 460

GRP Continously Threaded Bar

High durability and corrosion resistant

High tensile and shear strength

Light weight – ¼ of steel

Acid resistant

Non-conductive

Permanent applications – 100+ years design life

ISO9001: 2015
CC 125

ISO14001: 2015
EC 060

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GRP Continously Threaded Bar

DESCRIPTION
ARDEX CE 460 is a high strength, durable threaded bar which provides a corrosion resistant, light weight alternative to traditional steel bar for soil nail and ground anchor applications. The product incorporates a unique manufacturing process and the highest quality glass fibres and vinyl ester resins for a strong and durable product.

ARDEX CE 460 is designed for use with our specialised ARDEX grout system for applications where additional durability is required including slope stabilisation, ground anchors and rock bolts.

RECOMMENDED USES
- Soil nails
- Ground anchors
- Spot bolts
- Face nails
- Soft eyes
- Slope stabilisation
- Rock reinforcement
- Concrete reinforcement

ADVANTAGES
- High durability and corrosion resistant
- High tensile strength 1000MPa
- Light weight – ¼ of steel
- High shear strength
- Acid resistant
- Non-conductive
- Permanent applications – 100+ years design life
- Sustainability

PACKAGING

Model	Lengths
CE 460-25mm	6m, 8m, 10m, 11.8m
CE 460-32mm	6m, 8m, 10m, 11.8m
CE 460-40mm	11.8m

Note:
Bars can be namufured to any length upon request.

TYPE OF RESINS
- Vinyl Ester Resin - Permanent applications
- Polyester Resin - Temporary applications

STORAGE
The product must be stored on site where it will be safe from damage or contamination.

INSTALLATION
1. Handling
- Gloves should be used always when handling the GRP bars.
- Gloves, safety glasses and dust mask must be worn as a minimum when cutting GRP bars.

2. Installation of GRP bar into bore holes
- The bars must be inspected prior to the instillation to ensure there is no damage to the bar or the thread.
- If the bar or thread is damaged, either replace the bar or cut out the damaged section and couple together with a new section of undamaged bar.

3. Installation of the nuts and couplers
- Ensure the correct nut and/or coupler has been selected in accordance with design requirements.
- Before the installation of the nut or coupler, the thread must be checked to ensure there is no damage.
- Ensure the thread is clean and free of contaminates such as grout, concrete, oils, grease etc.
- When installing the nuts, they must only be hand tightened to a 'snug' fit against the plate ensuring there is no gap. If there is any angle compensation, an approved dome ball washer may be used to compensate for the angle.
- Be sure not to apply any torsion or torque as the ARDEX CE 460 bars have a low torsion load rating
- If an initial load is required contact ARDEX-QUICSEAL for advice on applying the load.

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TESTING PROCEDURES

1. Setting up testing frame

- When using timbers or steel whalers or a test frame, ensure that they are secured to the slope or wall and the load is transferred to the soil, not to the grout or nail.
- The testing frame must be set up to ensure that everything is square, and the nail is being pulled in direct tension. The bar must not bend or twist in any direction.
- There must be a nominated free length when testing. Ensure the GRP bar is not secured into the concrete facing or grout pad.

2. Testing equipment

- Ensure the testing equipment has been calibrated.

3. Installation of the nuts

- Ensure the correct nut has been selected in accordance with design requirements.
- Before the installation of the nut, the thread must be checked to ensure there is no damage to the thread.
- Ensure the thread is clean and free of contaminates such as grout, concrete, oils, grease etc.
- When installing the nuts, they must be only hand tightened to a 'snug' fit against the plate ensuring there is no gap. If there is any angle compensation, an approved dome ball washer may be used to compensate for the angle.
- Be sure not to apply any torsion or torque as the ARDEX CE 460 bars have a low torsion load rating.
- When installing the nuts there must be a minimum of 3 threads (30mm) protruding from the nut.
- Do not test to loads above 90% of the rated load for the nut or coupler used for testing. The rated loads are outlined on the Technical Data Sheet.
- If you exceed the capacity of the nut or coupler the GRP thread is likely to strip.
- The rate of load application must not exceed 5 kN/minute.

TECHNICAL DATA

ARDEX CE 460

CHARACTERISTICS	TEST METHOD	RESULTS		
		25 mm	**32 mm**	**40 mm**
Tensile Stress Area	ACI 440.3R-4	346 mm^2	580 mm^2	950 mm^2
Ultimate Tensile Strength*	CSA-S806-02	350 kN	560 kN	860 kN
Shear @ 90º	DIN 21521	170 kN	245 kN	420 N/mm^2
Shear @ 50º	DIN 21521	345 kN	490 kN	
Tensile E-Modulus	ACI 440.3R-4		60 GPa	
Electrical Resistance	FM 5-578	>1000 kΩ/cm		
Alkaline Resistance**	CSA-S806-02, ACI 440.3R-4	UTS >90% retention E-Modulus >97% retention		
Creep Rupture Strength	CSA-S806-02, ACI 440.3R-4	10^6h = 60% of UTS		
Bond Stress	CSA-S806-02, ACI 440.3R-4	>20MPa		
Unit Weight		0.9 kg/m	1.5 kg/m	2.1 kg/m

** Appropriate reduction factors must be applied in accordance with relevant design Standards such as BS8006. Please contact ARDEX-QUICSEAL for further advice and recommended reduction factors.*

*** Valid for permanent GRP bars manufactured with Vinyl Ester resin.*

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ARDEX CE 460 Accessories

CHARACTERISTICS	TEST METHOD	RESULTS		
		25 mm	32 mm	40 mm
GRP Dome Nut	ISO 10406-1	70 kN	90 kN	90 kN
GRP Power Nut		180 kN	180 kN	180 kN
Steel Nut 150mm		220 kN	320 kN	380 kN
Steel Coupler 300mm		220 kN	320 kN	380 kN
Steel Power Nut		300 kN	450 kN	800 kN

STANDARDS, APPROVALS AND SPECIFICATIONS

ACI 440.3	Guide Test Methods for Fiber-Reinforced Polymers (FRPs) for Reinforcing or Strengthening Concrete Structures
CSA S807-02	Specification for fibre-reinforced polymers
BS 8006	Code of practice for strengthened/reinforced soils
US FHWA	Geotechnical Engineering
EuroCode 7	Geotechnical Design
VicRoads Section 683	Soil Nail Works

DISCLAIMER

The technical datasheets are based on the latest information and given in good faith and represent the best of our knowledge and experience at the time of printing. They are primarily offered for user's consideration and evaluation. It is the responsibility of the user to conduct their own tests to validate the suitability of the products. It is also the responsibility of the user to ensure that the products are used and handled correctly and in accordance with any applicable standards, the product instructions and recommendations and only for the uses they are intended. As we have no control over site conditions and the execution of the work, we accept no liability for any loss or damage which may rise as a result thereof.

We also reserve the right to update the information at any time without prior notice to you to reflect our ongoing research and development program.

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