

Omega-Bolt® 120 / 120 C

Product code: OB12 / OB12 C

Product specification: Inflatable rock bolts

Category: Friction rock bolts for mining and tunneling

Introduction

Omega-Bolt® is manufactured from high-strength steel to assure high loading capacity and good elongation. Omega-Bolt® can accommodate large ground movement and can be utilized to stabilize underground excavation even in weak rocks. Omega-Bolt® is produced with modern tube-forming technology and 100% robotic assembly under strict quality control procedures. After two decades of experience, Omega-Bolt® now features a “full-open gap profile”, which allows the best quality of corrosion protection, avoiding areas with a too thin or too thick coating.

Main Advantages

- Immediate load-bearing capacity after installation
- Extra elongation to accommodate even large deformations
- Immediate full load-bearing capacity over the entire installed bolt length
- Trouble-free installation in water-bearing boreholes
- Low sensitivity to vibrations caused by blasting works
- Ability to maintain load-bearing capacity even when undergoing deformations
- Safe and easy installation
- No additional grouting materials are required for installation
- Flexibility in case of differing or varying boreholes



Omega-Bolt® 120 C - Thermoplastic coating for corrosion protection and improved service life

Major parts of Omega-Bolt® are delivered in black steel and are intended for temporary rock reinforcement. In a corrosive environment, or when a longer service life is required, Sandvik Ground Support offers a corrosion-protected version, where the entire rock bolt is covered by a scratch-resistant and flexible thermoplastic coating. The thermoplastic coating is applied evenly on all surface parts, thanks to advanced spraying technology. A specially developed “full-open gap” profile creates a physical barrier to prevent water and corrosive elements from attacking the external steel surface Omega-Bolt®.

Technical Specifications

	Unit	Omega-Bolt® 120
Nominal Ultimate Load kN ⁽¹⁾	kN	120
Nominal Yield Load	kN	100
Minimum Elongation A ₁₂₅ ⁽²⁾	%	10
External omega profile diameter	mm	27
External original round profile diam.	mm	41
Wall thickness	mm	2
Inflation ferrule stem diameter	mm	30
Inflation ferrule rim diameter	mm	38
Upper end-cup diameter	mm	28
Required borehole diameter	mm	32-40
Recommended borehole diameter	mm	36-38
Inflation water pressure	bar	300

(1) Tensile test performed on the entire bolt, after profile inflation, i.e., simulating real condition after rock bolt's installation

(2) Elongation measured on expanded profile, simulating real working conditions after installation

Type of coating - Thermoplastic Powder fused on steel surface

Chemical resistance in acid conditions (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Chemical resistance in alkaline condition (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Coating thickness on profile	≥150 µm	
Coating thickness on inflation bushing	<300 µm	
Durability (*) in class Im3	>15 years	ISO 12944 part 6, underground conditions
Durability (*) in class C5-M	>15 years	ISO 20340, for offshore applications

Omega-Bolt® Full Product Range of Bolts and Accessories

- Omega-Bolt® 240 – 240C for extra loading capacity
- Omega-Bolt® 160/200: cost-effective solutions for 45-51 mm boreholes
- Connectable Omega-Bolt® 240 for special applications when long inflatable rock bolts are required
- Complete range of flat and domed face plates, including the innovative Omega Opti-Plate 120
- Eye-ball to facilitate installation in broken ground, centralizers to facilitate installation through mining mesh, and ASTM color-code plugs
- Pneumatic, electric, and hydraulic high-pressure inflation pumps and chucks for manual or mechanized installation

All dimensions, weights, quantities and specifications are those applicable at the time of this publication and may be amended from time to time. Please contact your local representative for final confirmation of any key specifications.

Omega-Bolt® 160 / 200

Product code: OB16 / OB20

Product specification: Inflatable rock bolts

Category: Friction rock bolts for tunneling

Introduction

Omega-Bolt® is manufactured from high-strength steel to assure high loading capacity and good elongation. Omega-Bolt® can accommodate large ground movement and can be utilized to stabilize underground excavation even in weak rocks. Omega-Bolt® is produced with modern tube-forming technology and 100% robotic assembly under strict quality control procedures. After two decades of experience, Omega-Bolt® now features a “full-open gap profile”, which allows the best quality of corrosion protection, avoiding areas with a too thin or too thick coating.

Main Advantages

- Immediate load-bearing capacity after installation
- Extra elongation to accommodate even large deformations
- Immediate full load-bearing capacity over the entire installed bolt length
- Trouble-free installation in water-bearing boreholes
- Low sensitivity to vibrations caused by blasting works
- Ability to maintain load-bearing capacity even when undergoing deformations
- Safe and easy installation
- No additional grouting materials are required for installation
- Flexibility in case of differing or varying borehole



Technical Specifications

Type	Typical Loading Capacity kN ⁽¹⁾	Elongation A ₁₂₅ ⁽²⁾ %	Required borehole diameter mm	Water pressure for inflation bar
Omega-Bolt® 160	160	10 %	45÷53	260
Omega-Bolt® 200	200	10 %	45÷53	300

(1) Tensile test performed on the entire bolt, after profile inflation, i.e., simulating real condition after rock bolt's installation

(2) Elongation measured on expanded profile, simulating real working conditions after installation

Omega-Bolt® Full Product Range of Bolts and Accessories

- Omega-Bolt® 240 – 240C for extra loading capacity
- Omega-Bolt® 120 kN, the most popular mining bolt, 35-38 mm boreholes
- Connectable Omega-Bolt® 240 for special applications when long inflatable rock bolts are required
- Complete range of flat and domed face plates, including the innovative Omega Opti-Plate 120
- Eye-ball to facilitate installation in broken ground, centralizers to facilitate installation through mining mesh, and ASTM color-code plugs
- Pneumatic, electric, and hydraulic high-pressure inflation pumps and chucks for manual or mechanized installation

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Omega-Bolt® 240 / 240 C

Product code: OB24 / OB24 C

Product specification: Inflatable rock bolts

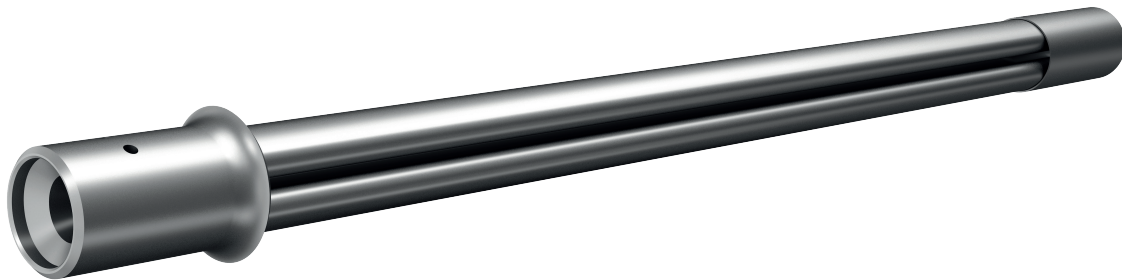
Category: Friction rock bolts for mining and tunneling

Introduction

Omega-Bolt® is manufactured from high-strength steel to assure high loading capacity and good elongation. Omega-Bolt® can accommodate large ground movement and can be utilized to stabilize underground excavation even in weak rocks. Omega-Bolt® is produced with modern tube-forming technology and 100% robotic assembly under strict quality control procedures. After two decades of experience, Omega-Bolt® now features a “full-open gap profile”, which allows the best quality of corrosion protection, avoiding areas with a too thin or too thick coating.

Main Advantages

- Immediate load-bearing capacity after installation
- Extra elongation to accommodate even large deformations
- Immediate full load-bearing capacity over the entire installed bolt length
- Trouble-free installation in water-bearing boreholes
- Low sensitivity to vibrations caused by blasting works
- Ability to maintain load-bearing capacity even when undergoing deformations
- Safe and easy installation
- No additional grouting materials are required for installation
- Flexibility in case of differing or varying borehole



Omega-Bolt® 240 C - thermoplastic coating for corrosion protection and improved service life

Major parts of Omega-Bolt® are delivered in black steel and are intended for temporary rock reinforcement. In a corrosive environment, or when a longer service life is required, Sandvik Ground Support offers a corrosion-protected version, where the entire rock bolt is covered by a scratch-resistant and flexible thermoplastic coating. The thermoplastic coating is applied evenly on all surface parts, thanks to advanced spraying technology. A specially developed “full-open gap” profile creates a physical barrier to prevent water and corrosive elements from attacking the external steel surface Omega-Bolt®.

Technical Specifications

	Unit	Omega-Bolt® 240
Nominal Ultimate Load [kN] ⁽¹⁾	kN	240
Nominal Yield Load	kN	200
Minimum Elongation A ₁₂₅ ⁽²⁾	%	10
External omega profile diameter	mm	36
External original round profile diam.	mm	54
Wall thickness	mm	3
Inflation ferrule stem diameter	mm	41
Inflation ferrule rim diameter	mm	46
Upper end-cup diameter	mm	38
Required borehole diameter	mm	43-52
Recommended borehole diameter	mm	45-51
Inflation water pressure	bar	300

(1) Tensile test performed on the entire bolt, after profile inflation, i.e., simulating real condition after rock bolt's installation

(2) Elongation measured on expanded profile, simulating real working conditions after installation

Type of coating - Thermoplastic Powder fused on steel surface

Chemical resistance in acid conditions (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Chemical resistance in alkaline condition (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Coating thickness on profile	≥150 µm	
Coating thickness on inflation bushing	<300 µm	
Durability (*) in class Im3	>15 years	ISO 12944 part 6, underground conditions
Durability (*) in class C5-M	>15 years	ISO 20340, for offshore applications

Omega-Bolt® Full Product Range of Bolts and Accessories

- Omega-Bolt® 120 kN, the most popular mining bolt, 35-38 mm boreholes
- Omega-Bolt® 160/200: cost-effective solutions for 45-51 mm boreholes
- Connectable Omega-Bolt® 240 for special applications when long inflatable rock bolts are required
- Complete range of flat and domed face plates, including the innovative Omega Opti-Plate 120
- Eye-ball to facilitate installation in broken ground, centralizers to facilitate installation through mining mesh, and ASTM color-code plugs
- Pneumatic, electric, and hydraulic high-pressure inflation pumps and chucks for manual or mechanized installation

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Connectable Omega-Bolt® 240 / 240 C

Product code: OBC

Product specification: Inflatable rock bolts

Category: Friction rock bolts for mining and tunneling

Description

Omega-Bolt® is manufactured from high-strength steel to assure high loading capacity and good elongation. Omega-Bolt® can accommodate large ground movement and can be utilized to stabilize underground excavation even in weak rocks. Omega-Bolt® is produced with modern tube-forming technology and 100% robotic assembly under strict quality control procedures. After two decades of experience, Omega-Bolt® now features a “full-open gap profile”, which allows the best quality of corrosion protection, avoiding areas with a too thin or too thick coating.

Connectable Omega Bolt® extend the use of inflatable friction bolts to secondary rock reinforcement or to any application where anchoring length is higher than excavation height. Connectable Omega consists of individual sections that are joined together via “R” type thread connections to reach the required length.

The system is formed by three design options:

- Injection Section featuring a Omega Bolt injection ferrule (ø41 mm) + a male R32 top connection
- Middle Section featuring a female R32 connection at the bottom + a male R32 connection top connection
- Blind (Top) Section featuring a female R32 connection at the bottom + a blind end cap at the top

Main Advantages

- Possibility to reach up to 12-meter-long rock bolt, even in 3x3 m or 4x4 m mining drifts.
- Third generation of “R” couplers, featuring a new seal design, granting the O-ring to remain in correct position
- Easy installation, with low torque requirements
- Low sensitivity against vibrations caused by nearby blasting works
- Ability to maintain load-bearing capacity even in case of evident rock deformations
- Safe and easy installation, even in case of water-bearing formations
- No additional grouting materials required for installation
- Excellent to compensate uneven borehole diameter
- Immediate rock support



Omega-Bolt® 240 kN

Blind



Middle



Injection



Connectable Omega-Bolt® 240 C - thermoplastic coating for corrosion protection and improved service life

Major parts of Omega-Bolt® are delivered in black steel and are intended for temporary rock reinforcement

In a corrosive environment, or when a longer service life is required, Sandvik Ground Support offers a corrosion-protected version, where the entire rock bolt is covered by a scratch-resistant and flexible thermoplastic coating. The thermoplastic coating is applied evenly on all surface parts, thanks to advanced spraying technology. A specially developed “full-open gap” profile creates a physical barrier to prevent water and corrosive elements from attacking the external steel surface Omega-Bolt®.

Technical Specifications for Omega-Bolt® 240

Typical Loading Capacity kN ⁽¹⁾	Elongation A ₁₂₅ ⁽²⁾	Required borehole diameter mm	Water pressure for inflation bar
240	>10 %	48÷51	300

(1) Tensile test performed on the entire bolt, after profile inflation, i.e., simulating real condition after rock bolt's installation

(2) Elongation measured on expanded profile, simulating real condition after installation

Type of coating - Thermoplastic Powder fused on steel surface

Chemical resistance in acid conditions (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Chemical resistance in alkaline condition (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Coating thickness on profile	≥150 µm	
Coating thickness on inflation bushing	<300 [µm]	
Durability (*) in class Im3	>15 years	ISO 12944 part 6, underground conditions
Durability (*) in class C5-M	>15 years	ISO 20340, for offshore applications

Suggested configurations for Omega-Bolt® 240

Sections	Comments
Injection + Blind	Most effective, this combination reduces the number of couplers and total cost
Injection + Middle + Blind	Most common and successful combination. Recommendable up to 12 m in total
Injection + Multiple Middle + Blind	Available to solve cases where only short section can be used. Max 12 m in total

Omega-Bolt® Full Product Range of Bolts and Accessories

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- Complete range of flat and domed face plates, including the innovative Omega Opti-Plate 120
- Eye-ball to facilitate installation in broken ground, centralizers to facilitate installation through mining mesh, and ASTM color-code plugs
- Pneumatic, electric, and hydraulic high-pressure inflation pumps and chucks for manual or mechanized installation

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Omega-Bolt® 240 SIF / 240 SIF C

Product code: OB24 / OB24 C

Product specification: Inflatable rock bolts

Category: Friction rock bolts for tunneling

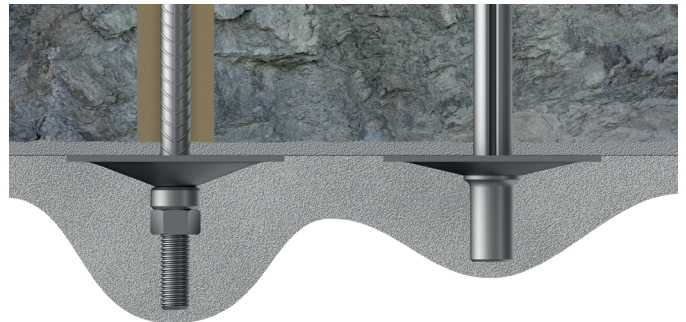
Introduction

Omega-Bolt® is manufactured from high-strength steel to assure high loading capacity and good elongation. Omega-Bolt® can accommodate large ground movement and can be utilized to stabilize underground excavation even in weak rocks. Omega-Bolt® is produced with modern tube-forming technology and 100% robotic assembly under strict quality control procedures. After two decades of experience, Omega-Bolt® now features a “full-open gap profile”, which allows the best quality of corrosion protection, avoiding areas with a too thin or too thick coating.

Omega-Bolt® 240 SIF (Short Inflation Bushing) is a special version, featuring a new geometry for the two ends. Following installation, a part of any rock bolt remains outside the drilled hole. In some applications, our customers need to minimize the part of the rock bolt sticking off the drilled hole. In mining, this occurs often in low-seam orebodies. In tunneling featuring waterproofing membranes, the protruding portion must be covered with additional shotcrete, resulting in unnecessary additional costs and time. In such scenarios, Omega-Bolt® 240 SIF provides the optimal solution.

Main Advantages

- Immediate load-bearing capacity after installation over the entire length of the installed bolt
- Trouble-free installation in water-bearing boreholes
- Low sensitivity to vibrations caused by blasting
- No additional grouting materials are required for Installation
- Optimized protruding section for saving on shotcrete and providing free headroom
- Maximized “embedded length” i.e., expanded profile in direct contact with the surrounding rock



Omega-Bolt® 240 SIF C - thermoplastic coating for corrosion protection and improved service life

Major parts of Omega-Bolt® are delivered in black steel and are intended for temporary rock reinforcement. In a corrosive environment, or when a longer service life is required, Sandvik Ground Support offers a corrosion-protected version, where the entire rock bolt is covered by a scratch-resistant and flexible thermoplastic coating. The thermoplastic coating is applied evenly on all surface parts, thanks to advanced spraying technology. A specially developed “full-open gap” profile creates a physical barrier to prevent water and corrosive elements from attacking the external steel surface Omega-Bolt®.

Technical Specifications

	Unit	Omega-Bolt® 240 SIF
Nominal Ultimate Load kN ⁽¹⁾	kN	240
Nominal Yield Load	kN	200
Minimum Elongation A ₁₂₅ ⁽²⁾	%	10
External omega profile diameter	mm	36
External original round profile diam.	mm	54
Wall thickness	mm	3
Inflation ferrule stem diameter	mm	41
Inflation ferrule rim diameter	mm	46
Upper end-cup diater	mm	38
Required borehole diameter	mm	43-52
Recommended brorehole diameter	mm	45-51
Inflation water pressure	bar	300

(1) Tensile test performed on the entire bolt, after profile inflation, i.e., simulating real condition after rock bolt's installation
(2) Elongation measured on expanded profile, simulating real working conditions after installation

Net Embedded Length

Omega-Bolt® 240 SIF can be delivered in standard length, i.e., where the bolt's requirements refer to the end-to-end length measure.

End-to-end bolt length mm	Net embedded length mm
3000	2875
3600	3475
4000	3875
5000	4875

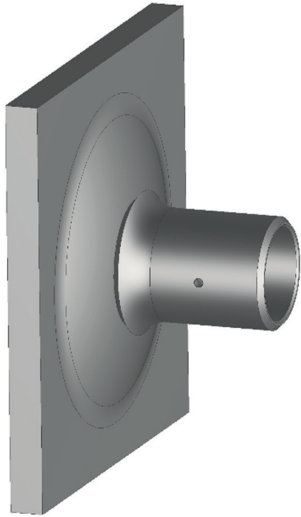
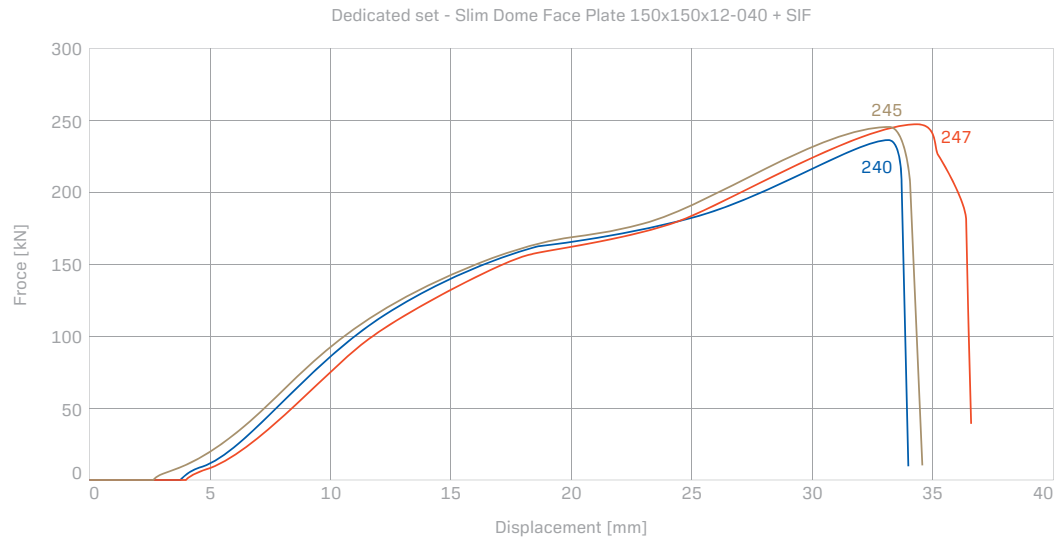
Type of coating - Thermoplastic Powder fused on steel surface

Chemical resistance in acid conditions (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Chemical resistance in alkaline condition (up to 60 °C)	Excellent	ISO 2812 and ISO 4628
Coating thickness on profile	≥150 µm	
Coating thickness on inflation bushing	<300 µm	
Durability (*) in class Im3	>15 years	ISO 12944 part 6, underground conditions
Durability (*) in class C5-M	>15 years	ISO 20340, for offshore applications

Slim Dome Face Plate 12 mm optimized for Omega-Bolt® 240 SIF

The new “Slim Dome” face plate featured the following benefits:

- “Stick out” section further decreased to 75 mm in total (ferrule + plate)
- Outstanding load capacity
 - Progressive flattening grants a smooth absorption of any convergence of the walls
 - Repeatable and reliable results
- System reaching the maximum rock bolt loading capacity
- No damage on the inflation ferrule



SIF kit for Omega inflation chuck

Due to a change in its geometry, the SIF ferrule requires a slightly modified Omega-Bolt® inflation chuck.

We can provide new Omega SIF installation chucks or a conversion ring for standard Omega inflation chucks.

Omega-Bolt® Full Product Range of Bolts and Accessories

- Omega-Bolt® 120 kN, the most popular mining bolt, 35-38 mm boreholes
- Opti-Load hemispherical washer and face plate for maximizing performance of Omega-Bolt® 120
- Omega-Bolt® 240 – 240C for extra loading capacity
- Omega-Bolt® 160 /200 : cost effective solutions for 45-51 mm boreholes
- Connectable Omega-Bolt® 240 for special applications when long inflatable rock bolts are required
- Complete range of flat and domed face plates, including the innovative Omega Opti-Plate 120
- Eye-ball to facilitate installation in broken ground, centralizers to facilitate installation through mining mesh, ASTM color code plugs
- Pneumatic, electric, and hydraulic high-pressure inflation pumps and chucks for manual or mechanized installation

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Omega-Bolt® Opti-Load System

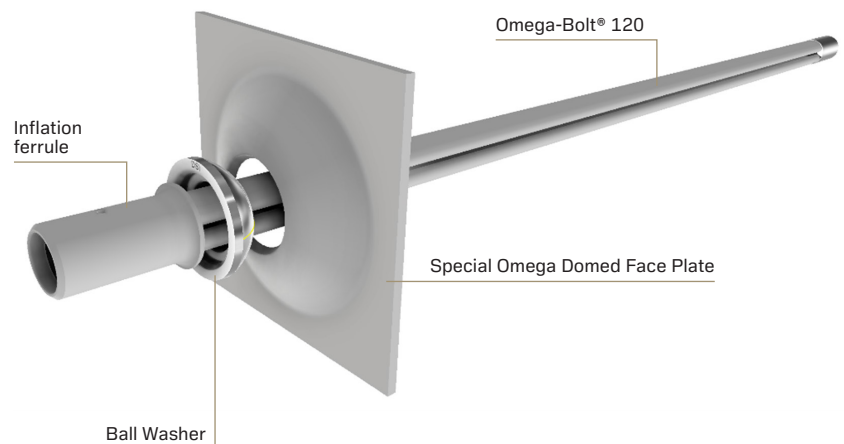
Product code: OOPT120

Product specification: Accessories for inflatable rock bolts

Category: Inflatable rock bolts for mining

Introduction

Opti-Load System is a complement to Omega-Bolt® 120 inflatable rock bolts, a best-seller product in underground mines all over the world. Opti-Load System is intended to optimize the performance of the rock bolt in its critical area, i.e. the interface between inflation bushing and face plate. The system is formed by a patent protected Ball Washer and an Omega Domed Face Plate of appropriate geometry and steel grade. Both the ball washer and face plate are mounted on a regular Omega-Bolt® 120 just before installation. The ball washer grants a better load transfer between bolt and plate and can compensate for misalignment between rock bolt and face plate.



Physical Properties

We are committed to product optimization and the highest quality standards. Several case studies on inflatable rock bolts (including Omega 120) showed that the interface between the inflation ferrule of the face plate represented a weak point. Following ASTM F432 -13 recommendations, we performed a large number of laboratory tests to measure load and displacement, using a variety of face plates associated with Omega-Bolt® with or without the patented ball washer.

Test results proved that the ball washer has a positive impact on the load capacity of the systems, and associated with the correct face plate allows enhanced absorption of deformation. Finally, the ball washer improves the capacity of the system to compensate for misalignment between bolts and plate up to 10°.

