



Mining & Tunneling Cables



Application

Open cast and underground mining requires ever-increasing performance of machines and methods. This has led to the large machines in use today. On bucket wheel and dragline excavators for instance, installed power of more than 15 MW and voltages up to 35 kV are no longer unusual.

These large, movable machines require medium voltage flexible reeling and trailing cables for power supply and are suitable for operation under the most extreme conditions.

PROTOLON® and **PROTOMONT®** reeling and trailing cables for open cast and underground mining have been field-proven worldwide for decades. In these mining applications, particular requirements such as mechanical



Benefits

> Unique Mechanical Performance

Technergy™ Mining and Tunnelling cables have been designed to withstand extreme conditions in terms of:

- Tensile loads
- Torsional stresses occurring during misalignment of cable guidance systems and oblique pay out
- Minimum bending radius at any ambient temperature range and stress conditions
- High travel speeds and acceleration.

> Chemical and Climate Resistance

Technergy™ Mining and Tunnelling cables have been designed to withstand the most severe conditions. For these applications Prysmian has developed the **SEVEREX** high performance compounds. **SEVEREX** compounds are used in **Technergy™ Mining and Tunnelling** cables to guarantee resistance to extreme conditions (such as high-speed, oil and fuel, mud, moisture, and acids and basis), as well as to harsh environments (for instance, extreme low/hot temperature, UV irradiation and ozone).

> Miniaturised

Technergy™ Mining and Tunnelling cables have the smallest possible dimensions. For instance, in MV cables:

Dimension: up to 30% less and yet in strict compliance with the existing standards.

Weight: higher cable performance allow up to a 40% reduction in the cable weight.

Robustness: higher physical/mechanical resistance, exceeding standard requirements in terms of abrasion, cut-through and repeated bending.

EXTREME DUTY . MINIATURISED . SAFETY



Afumex®



strength and safety have led to the use of high-grade mechanically resistant rubber.

Prysmian has developed extensive know-how over many years about the special operational conditions of open cast and underground mining. The decisive factor was close cooperation with many significant mining companies. The experience we gain every day contributes to the design of **PROTOLON®** and **PROTOMONT®** mining cables. The high operational reliability and service life of Prysmian's reeling and trailing cables for mining is based on this experience.

Technergy™ Mining & Tunnelling cables offer significant benefits to a broad variety of specialized mining professionals such as OEMs, specifiers, contractors, installers, mining companies and more. These benefits include:

> Customised and Multifunctional Engineering

Prysmian designs, compounds and builds cables according to specific customer needs.

This allows us to have an exhaustive product range covering all functionalities (MV/LV, Instrumentation and Control, Optical fibres).

Prysmian designs multifunctional cables from the simplest to the most sophisticated.

Total cost of ownership

> Longer Lifetime

Technergy™ Mining and Tunnelling cables guarantee an extended working lifetime (lower failure rate) in comparison with standard and traditional mining and tunnelling cables. As a consequence the total cost of ownership is lower.

Standard

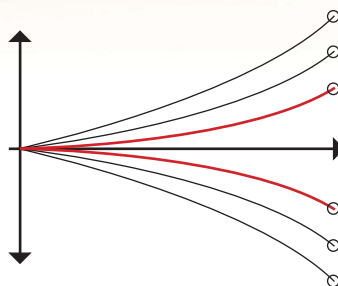
Standard Mining

Technergy™ Cables

Years

> Stock Availability

Technergy™ Mining and Tunnelling cables are immediately available and deliverable. There are more than 80 stock keeping units. This ensures short lead times and a reduction of logistics costs for the end-user.



About us

Prysmian Cables & Systems is a world-class multinational company. Founded in 1872 as Ditta Pirelli & C., it has achieved a leading position for more than a century of operations in its two key international markets - "Energy Cables and Systems" and "Telecom Cables & Systems".

Prysmian Cables and Systems is the world's largest manufacturer of power and telecommunications cables, with 52 manufacturing facilities in 21 countries in five continents and a market share in excess of 10%.

Prysmian Energy Cables and Systems is a global solutions provider, offering a wide range of integrated solutions, such as cable systems, system design and engineering, project management, installation and post-sale services.

Prysmian Energy Cables and Systems concentrates on continuous product innovation and on achieving a competitive edge by focusing on research and development. This is done through Prysmian's own R&D centres and by co-operating with universities, scientific institutions and above all, our customers. Prysmian's world-wide organisation makes and delivers advanced technological solutions to customers anywhere in the world.



Prysmian's TECHNERGY integrated cabling solutions™ is one of the world's most comprehensive and technologically advanced answers to industry, infrastructure, contractors and OEM's specific requirements.

TECHNERGY integrated cabling solutions™ are designed and structured into twelve different product lines. Each of these offer tailored designs and added value solutions to the most diverse functional and environmental requirements in the following fields:

- > Trains
- > Marine
- > Oil & Gas
- > Plant & Petrochem
- > Mining & Tunnelling
- > Defence
- > Cranes & Mobile Equipments
- > Electro-Mechanical
- > Data & Communication
- > Transportation Infrastructures
- > Building & Civil Engineering
- > Power Plants

To find out more about the TECHNERGY integrated cabling solutions™, Prysmian Cables and Systems invites you to visit the web site: www.prysmian.com



Cable families at a glance

FLEXIBLE CABLES

according to **VDE 0250**

OPEN CAST MINING

PROTOLON (M) - R

Excavator reeling cables

PROTOLON (ST)

For continuous use in water

PROTOLON (SB)

For trailing operations

PROTOLON (M) - F

Medium Voltage flexible cables for fixed installations

PROTOLON 1- core cables

Single core Medium Voltage cables

PROTOMONT (M)

Low Voltage power and control cables

PROTOMONT (M) MSR

Data, signal and control cables for mining installations

OPTOFLEX (M)

Rubber sheathed flexible fibre-optic cables



CYLINDRICAL REELS

MONO SPIRAL REELS

PUMPS

DREDGERS

OPEN CAST MINING

LEADER IN MINING CABLES

TUNNELLING/UNDERGROUND MINING

PROTOMONT (Z)

Coal cutter cables for free trailing

PROTOMONT (V)

Coal cutter cables for chain operations

PROTOLON rubber sheathed cables

Low Voltage power and control cables

SUPROMONT

Medium Voltage flexible power cables

PROTOMONT

Special cables for max 200 m suspension length

CORDAFLEX (S)

Low Voltage reeling cables for scoops and jumbos

PROTOMONT

Medium Voltage tunnel driving machine cables

PROTOMONT (M) MSR

Data, signal and control cables for mining installations

OPTOFLEX (M)

Rubber sheathed flexible fibre-optic cables

CYLINDRICAL REELS

MONO SPIRAL REELS

UNDERGROUND LIFTS

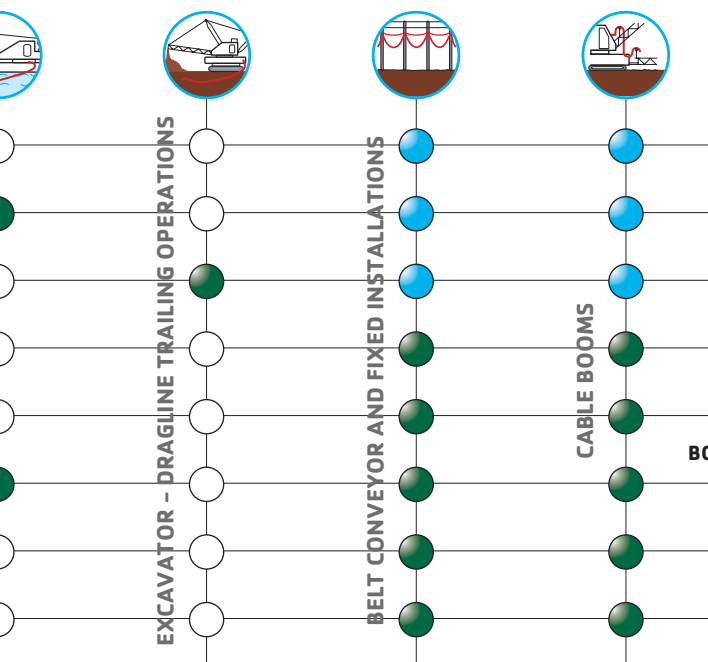
CABLE PROTECTION CHAINS

STRONGLY
RECOMMENDED

SUITABLE

NOT
SUITABLE





FLEXIBLE CABLES

according to **BS 6708 - 6116**
BCS 295

BS 6708 (Type 321-331-631) - BS 6116 (Type 321-621)

For trailing operations

BS 6708 (Type 321-331-631) - BS 6116 (Type 321-621)

Medium Voltage flexible cables for fixed installations

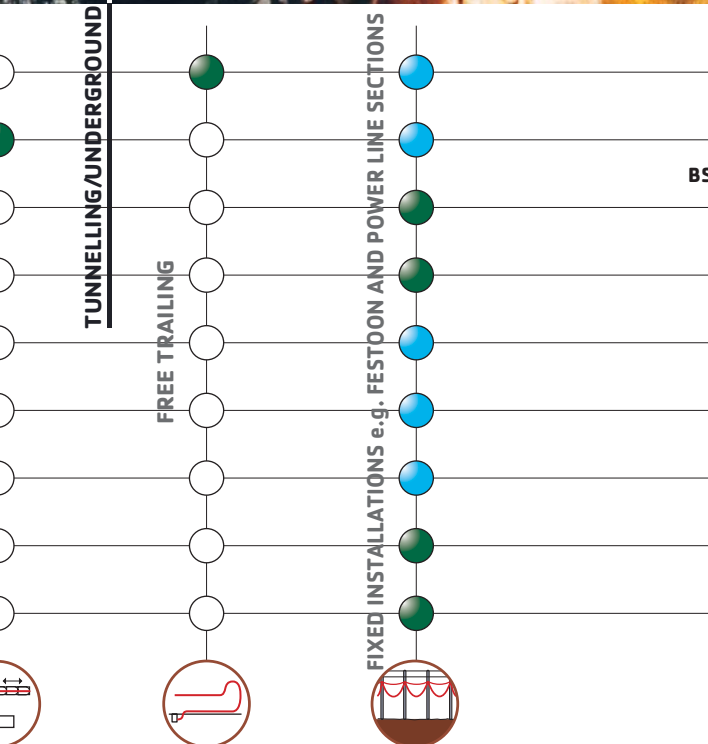
BCS 295 (Type 600/1000V) - BS 6708 (Type 62-63-64-201-211)

Low Voltage power and control cables

BS 6708 (Type 506-512-518-524)

Data, signal and control cables for mining installations

OPEN CAST MINING



BS 6708 (Type 11-7-7M-7S-307-307M-307S)

Coal cutter cables for free trailing

BS 6708 (Type 11-7-7M-7S-307-307M-307S)

Coal cutter cables for chain operations

BS 6708 (Type 62-63-64-201-211) - BCS 295 (Type 600/1000V)

Low Voltage power and control cables

BS 6708 (Type 321-331-631)

Medium Voltage flexible power cables

BS or BCS

Special cables for single point suspension

BS 6708 (Type 11)

Low Voltage reeling cables for scoops and jumbos

BS 6708 (Type 331-631)

Medium Voltage tunnel driving machine cables

BS 6708 (Type 506-512-518-524)

Data, signal and control cables for mining installations

TUNNELLING/UNDERGROUND MINING

**STRONGLY
RECOMMENDED**

SUITABLE

**NOT
SUITABLE**

Quality commitment



Prysmian has a built in multi-step quality assurance program, covering the production process from cable design and raw material purchasing to final inspection and testing documentation.

The Prysmian quality control system has been assessed and approved and is audited regularly by **Lloyd's Register of Quality Assurance, to ISO 9001 and ISO 14001 Quality System Standards.**

ISO 14001 is the environment quality standard.



References mining & tunnelling

	Site	Country
Europe	Belchatow	Poland
	Deutsche Solvay	Germany
	Deutsche Steinkohle AG	Germany
	RJB Mining	UK
	Scottish Coal	UK
America	Turow	Poland
	Atacocha	Peru
	Codelco	Chile
	Glencor	Peru
	Mimosa	Mexico
	RadomiroTomic	Chile
	Volcan	Peru
Asia	Bukit Assam	Indonesia
	Lampang	Thailand
	Mae Moh	India
	Neyveli	Indonesia
Africa/Middle East	Ashanti Goldfields	Ghana
	Gecamine	Zaire
	Gencor	South Africa
	Jordan Phosphate	Jordan
	OCP	Morroc
Australia	BHP	Australia

Prysmian cable service



CABLE SERVICE

In case of damage, we are there to help. We can repair your cables either directly on site or at our works. In all cases, we use original repair materials and proven techniques.

Our skilled specialists ensure that the overall performance characteristics of your cables is not impaired.

Prysmian can tailour training to specific customer requirements. Comprehensive documentation and certificates always accompany the conclusion of training.



ACCESSORIES OUTFIT

At our works or directly on site we assemble your special cables ready to connect, as specified by you. We supply sets of assembly material, which are specially geared to your needs:

- > Sealing ends of cast-resin design, hybrid design and vulcanised design
- > Special sealing ends
- > Medium Voltage plug connectors

