

Mining Cables

ELECTRICAL CABLES DESIGNED FOR THE MINING INDUSTRY



A brand of the

Prysmian
Group

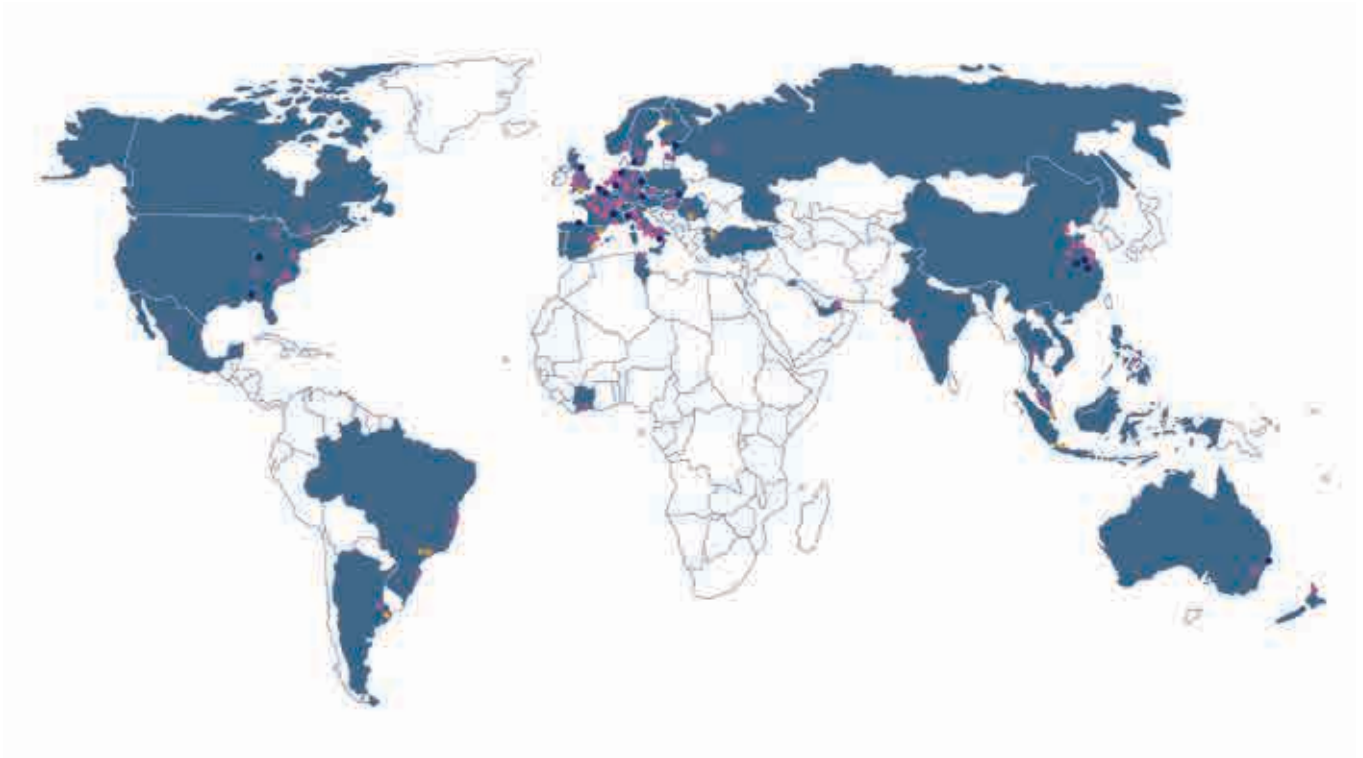
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Introduction



Prysmian Group



ONE LEADER, TWO BRANDS

The world's largest cable company, the Prysmian Group, consists of Prysmian and Draka which are two of the world's most respected commercial brands in the industry. With subsidiaries in 50 countries, almost 100 manufacturing plants, 17 Research & Development Centres and around 22,000 employees, the Prysmian Group is truly a global company.

Proudly manufacturing in Australia since 1940, Prysmian understands local standards and conditions and our products are designed and developed accordingly. Prysmian specialises in integrated, added value cabling solutions highly customised to the individual specifications of customers. Prysmian operates a Quality Management System compliant with the requirements of ISO 9001:2008 and products are fully supported by the global technical and production capabilities of the Prysmian Group.

Prysmian understands local standards and conditions and our products are designed and developed accordingly.



Cable Components



DEVELOPMENT OF ELASTOMERIC POWER CABLES FOR SAFE AND RELIABLE MINING AND INDUSTRIAL APPLICATIONS HAS PARALLELED THE DEVELOPMENT OF THE ELECTRIC MOTOR AND POWER GENERATION SINCE THE 19TH CENTURY.

Elastomeric cables are the natural choice for applications where durability, flexibility, and safe operation under extreme environmental conditions are important. The Prysmian Group's elastomeric cables have been "field proven" in thousands of operations, and with continuous development, utilise the best features of cables offered around the world.

In Australia, as elsewhere, there are many established guidelines governing manufacture of mining and industrial cables. Innovation in work practices, with more equipment operating at higher voltages, has required the continued development of new elastomeric cable designs. Ongoing development programs have also been required to continually improve the reliability and safety of current designs. The major design responsibility for the Prysmian Group is to ensure that

cables supplied will operate reliably and safely under a wide range of conditions. Personnel often work close to energised cables, especially in underground mines. The cable construction and materials must be selected to provide maximum safety during both normal operation and in the case of cable failure.

CONDUCTORS

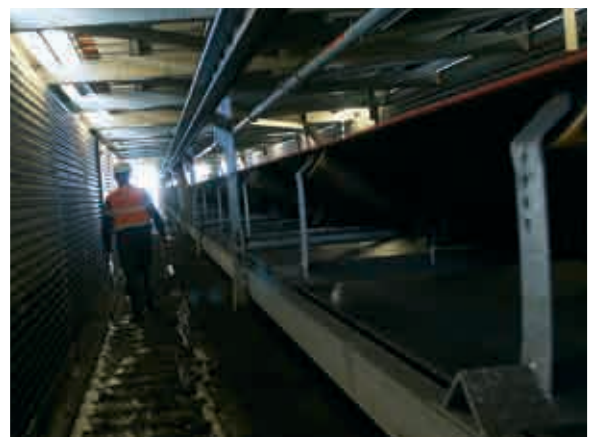
The important flexibility, strength and electrical properties of mining and industrial cables are mainly derived from the particular conductor design used, and any armouring or reinforcement. Conductors used in these cables are to Australian and International Standards, and usually employ tinned annealed copper wires stranded to provide optimum flexibility. Flexibility is influenced by the number of individual wires for a given size, the lay length of bunches and strands, and the geometric arrangement of the strands.



A simple examination of wires and their size is not a reliable guide to their flexibility or endurance, since special designs are often developed to suit particular applications. These would include cables for heavy-duty reeling or flexing such as ship-loader or longwall shearer applications. The use of specially designed power, earth or pilot conductors, and their locations in the cable provide a good example of this.

CORE ASSEMBLY LAY LENGTH

This is a vital factor affecting cable life when the cable is subjected to repeated reeling, especially under tension. A ratio of cable lay length (pitch) to pitch circle diameter (the diameter of a circle passing through the mid points of the cores) is commonly used to specify lay lengths suited to various applications. For moderate duty reeling cables, this value should be less than 12.5, and for trailing cables it should be less than 17.





INSULATION

In the past fifty years, natural rubber insulation has been replaced by synthetic polymeric compounds with inherently superior properties. Ethylene-propylene copolymer (EPR) and terpolymer (EPDM) are most common on flexible cables, offering excellent thermal durability, corona resistance, and electrical characteristics. Cross linked polyethylene (XLPE) insulation has found limited use in fixed applications.

Insulation materials are chosen for optimum dielectric characteristics, and resistance to deterioration through heat, oxidation, salts and copper compounds. Inert fillers are used for maximum electrical stability and low moisture absorption.

PILOT

The resistance between mining equipment and earth is usually high, and dangerous voltages can be present. To prevent hazards from shock, ground fault currents are controlled by various systems, including neutral resistance grounding. To ensure the integrity of this safety circuit, a small independent current may be

passed through a pilot conductor to the load centre and return through the earth conductor. If this current is interrupted through breakage, then the circuit breaker will automatically trip and remove power from the cable. Australian mining regulatory authorities require the inclusion of an extensible central pilot conductor (for monitoring circuit integrity). This is specially designed and manufactured to restrict extensibility in service. The cores of each underground coal mining cable must also be electrically symmetrical for added safety.

SCREENS

Bending of conductors under tension accelerates the breakage of individual wires. Partial failure of conductors can lead to wire ends that penetrate through the insulation. Metallic screens over the power cores, or earthing cores associated with semiconductive rubber components are provided to ground such faults through an earth. Besides being part of the earth fault detection circuit, screens relieve non-uniform electrical stresses and provide a uniform capacitance to ground.

Screening is achieved by either a helically applied layer of wires, a composite textile and tinned copper wire braid, semi-conductive elastomer, or a combination of the latter. Medium voltage reeling and trailing cables usually have either individually core composite textile / copper braid or semiconductive rubber screens for minimal fatigue failure. Collective screens of either semiconductive rubber, braids, or pliable steel wire armour with copper wires to achieve the desired conductivity may also be used. The latter types are used in cable constructions for fixed or feeder cable applications.

Semiconductive rubber screens are used in cables connected to systems which are able to limit earth faults to around 500 mA (r.m.s.) within about 10ms. Australian cables have fire propagation resistant semiconductive screens.

ARMOUR & REINFORCEMENT

Prysmian Group trailing cables manufactured to AS/NZS 1802 and AS/NZS 2802 and subjected to harsh wear, employ nylon textile or woven polyester tape, or an open braid of Kevlar® fibre as reinforcement. This enhances the sheath's mechanical strength, and improves the resistance against damage from crushing, stretching, and tear propagation.

Where a very high degree of impact and cut resistance is required, designs will usually have a pliable wire armour. This makes the cable much heavier and more difficult to handle and use. Heavy duty textile reinforcement is preferred from an operational point of view.

SHEATH

The primary role of the cable sheath is to protect the underlying core assembly from mechanical, chemical, or other environmental damage. Polychloroprene (PCP), chlorosulphonated polyethylene (CSP), and chlorinated polyethylene (CPE) are the most commonly used synthetic polymers used in sheaths today. They are commonly filled with other materials to enhance sheath performance.

A properly formulated sheathing compound is essential for a high performance reeling or trailing cable. The higher the tensile strength, the stronger the material is when stretched. As the material gets hotter, tensile strength reduces with a consequent reduction in tear resistance. As cables age, elongation may be reduced (the material becomes brittle).



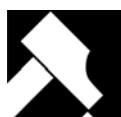
Cable Handling

Cable Usage Characteristics



AMBIENT TEMPERATURE

Maximum continuous conductor temperature
Minimum continuous conductor temperature



MECHANICAL IMPACT RESISTANCE

1	Light Impact
2	Moderate Impact
3	Heavy Impact
4	Very Heavy Impact



RESISTANCE TO SOLAR RADIATION AND WEATHER

Excellent	Permanent
Very Good	Frequent
Good	Occasional
Acceptable	Accidental
Poor	None



BEHAVIOUR IN FLAME AND FIRE

Reaction To Fire	Resistant To Fire
C 1 Fire retardant	CR 1 Fire resistant
C 2 Flame retardant	CR 2 All non CR 1 cables
C 3 No fire performance	



HALOGEN FREE

Halogen free (toxic fume or corrosives) cables



MINIMUM BENDING RADIUS

Minimum bending radius of installed cables



CHEMICAL RESISTANCE

Excellent	Permanent
Very Good	Frequent
Good	Occasional
Acceptable	Accidental
Poor	None



RESISTANCE TO WATER

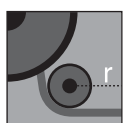
Negligible	No humidity
Water Drops	Occasional condensation
Spray	Water run off
Splashes	Exposed to water splashes
Heavy Sea	Exposed to waves
Immersion	Temporarily covered by water
Submersion	Permanently covered by water



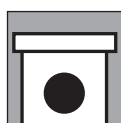
FLEXIBILITY

Rigid	Flexible
Semi-rigid	Semi flexible
	Very flexible

Laying Conditions



MINIMUM BENDING
RADIUS DURING
INSTALLATION



IN TRENCH



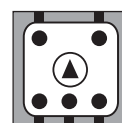
IN GROUND



IN DUCT



DOMESTIC
APPLIANCES



MACHINES



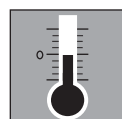
MOBILE
EQUIPMENT



SUBMERGED



OVERHEAD AERIAL



MINIMUM
INSTALLATION
TEMPERATURE



IN FREE AIR



IN GROUND WITH
PROTECTION



IN CONDUIT



OUTDOOR
APPLIANCES



FESTOON



INTERNAL
WIRING



INDUSTRIAL
EQUIPMENT



EXTERNAL
BUILDING

Health, Safety and Environment



PEOPLE ARE OUR GREATEST ASSET. WE BELIEVE EVERYONE HAS THE RIGHT TO WORK AND LIVE IN A HEALTHY AND SAFE ENVIRONMENT.

The Prysmian Group maintains our commitment to comply with all relevant Occupational Health, Safety and Environmental legislation, Australian and New Zealand Standards (AS/NZS 4801 and ISO 14001) Licences and Industry Codes of Practices.

Our goal is an environmentally and socially sustainable business and we believe that a safe work environment is a sign of efficiency and quality. Accidents can be prevented and we commit to continually improve, to achieve zero incidents of work related injury, illness and environmental pollution.

We also aim to help our customers fulfil their environmental responsibilities by providing them with cables and associated products that we believe have been manufactured as efficiently, economically sound and environmentally sustainable as possible. As our products are locally designed and manufactured we recognize the importance of risk assessment and mitigation in all mining operations.

For additional support in this area we have dedicated technical staff available to provide specific product information and guidelines for use please contact: sales.au@prysmiangroup.com



Quick Reference Guide

Standard Code	HV Feeder	Section Power	Lighting	Power Tools	Cutter Motor	Conveyor Drive	Longwall Power	Longwall Shearer	Roof Bolter	Mule	Shuttle Car
210.1			●	●	●						
209.1	●	●			●	●			●	●	
209.3	●				●		●				
240.1		○			●						
240.3					●		●				
240.11	●										
241.1		●	○		○	○			○	○	
241.3					○		●				●
241.11	○										
245.1					○						
245.3					●		○	●			
275.1					○				○	○	●
Type 1					○						
Type 2S			●	●	●						
Type A		●									
Type B		●									
409											
440											
441											
450											
451											
455											

● Special design constructions including fibre optic cable component may apply. Consultation with Prysmian specialists recommended.

LEGEND: ● Recommended ○ Suitable ● Specially Designed

Continuous Miner	Road Header	Loader	Continuous Haulage	Ventilation Fan	Drill Rig	Face Shovel	Bucket Wheel	Dragline	Pump	Dredge	Stacker - Reclaimer	Ship Loader	Container Crane
●	●	●	●	●									
●	○	○	○	○									
			●	○									
		○		○									
					●	●	○	●	○				
					○	○	○	○	●				
					○	○	●	●	○		●	●	●
					○	○	●	●	○				
					●	●	●	●	○		●	●	●
									○		●	●	●

“ELECTRIC CABLES IN UNDERGROUND COAL MINE HAZARDOUS ZONES ARE SUBJECT TO AN EXTREMELY ARDUOUS ENVIRONMENT THAT IS OFTEN VERY WET. IN ADDITION, THEY ARE HANDLED REGULARLY BY MINE WORKERS WHILE ENERGISED.”

- NSW Government Industry & Investment. Technical Report EES-100.
Electrical Engineering Safety Underground Coal Mine. Electric Cables used in Hazardous Zones



Underground Mine Cables

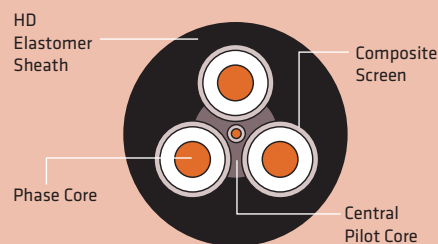
Australian and New Zealand coal mines are some of the safest in the world. This safety record is built on strict controls and legislation to ensure that the cables for mining equipment and in particularly those used in hazardous areas are of particularly high quality.

Our cables listed in this section are compliant with the relevant standards for the differently classified zones of an underground mine, including AS/NZS 1802, AS/NZS 1972 and AS/NZS 5000.1. Prysmian cables manufactured to these standards have a proven track record of safe and reliable performance in the harsh environments that exist in underground mines.

We understand that a longwall mining operation may have very different demands on cable performance to a board and pillar or hydraulic monitor operation and our range is tailored to suit the specific challenges that varied mining operations present.



Type 209 1.1-11kV



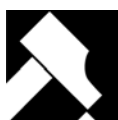
COMPOSITE SCREENED CABLE FOR GENERAL USE TO AS/NZS 1802

Composite screened cores with a single extensible pilot. 1.1/1.1kV to 11/11kV General cable used extensively for feeder connection between transformer and gate-end box or similar, or feeder cables to pumps, fans, crushers, etc or as a substitute to Type A or B feeder cables.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core plus central pilot
Maximum Continuous Operating Temperature:	90°C
Conductor Separator Tape:	1.1/1.1kV – polyester 3.3kV and above – semiconductive screen

INSULATION:

EPR (R-EP-90)	
Insulation Tape:	1.1/1.1kV – proofed textile 3.3kV and above – semiconductive screen

SCREEN:

Composite screen (earth) of tinned annealed copper wire and polyester yarn
Core Colours Red, White, Blue Braid Tracers

PILOT:

Single, in centre of cable Max. D.C. resistance of 5.5 Ω/100m for power cores to 35mm², and 3 Ω/100m for power conductors above 35mm²

SHEATH:

Heavy duty HD-85-PCP
Sheath reinforcement is available upon request

Installation Conditions



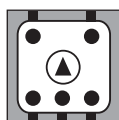
IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT



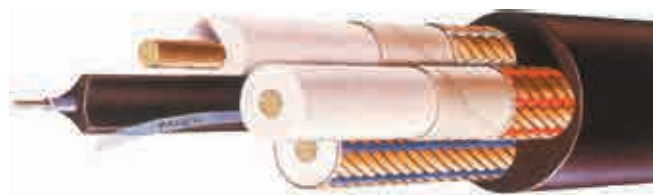
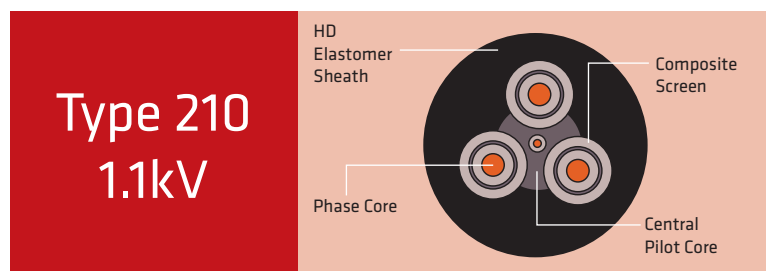
MACHINES

This cable can also be used above ground for power supply to mobile equipment.

Type 209 1.1-11kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm	mm	kg/100m
Type 209.1											
10-209-1	10	4.6	1.5	2.58	0.130	4.47	0.314	8.2	3.8	33.3	175
16-209-1	16	6.2	1.6	1.58	0.118	2.74	0.379	10	4.0	37.3	225
25-209-1	25	7.2	1.6	0.951	0.112	1.66	0.432	12	4.3	40.3	285
35-209-1	35	8.4	1.6	0.698	0.107	1.22	0.493	14	4.6	43.6	335
50-209-1	50	9.7	1.7	0.523	0.104	0.924	0.526	14	5.0	47.7	410
70-209-1	70	12.0	1.8	0.346	0.0981	0.623	0.599	16	5.4	54.0	540
95-209-1	95	13.3	2.0	0.271	0.0955	0.498	0.591	18	6.0	58.9	645
120-209-1	120	15.3	2.1	0.210	0.0925	0.397	0.640	21	6.4	64.6	790
150-209-1	150	17.2	2.3	0.166	0.0907	0.328	0.652	23	6.9	70.4	955
185-209-1	185	18.8	2.5	0.137	0.0902	0.284	0.657	30	7.4	76.5	1155
240-209-1	240	21.7	2.8	0.107	0.0883	0.240	0.672	34	8.2	85.5	1445
300-209-1	300	24.3	3.0	0.0850	0.0873	0.211	0.719	49	8.8	94.3	1790
Type 209.3											
16-209-3	16	6.2	3.0	1.58	0.131	2.75	0.255	14	5.3	47.3	335
25-209-3	25	7.2	3.0	0.951	0.125	1.66	0.280	15	5.6	50.4	400
35-209-3	35	8.4	3.0	0.698	0.119	1.23	0.311	16	5.9	53.5	460
50-209-3	50	9.7	3.0	0.523	0.114	0.927	0.347	17	6.3	57.2	540
70-209-3	70	12.0	3.0	0.346	0.106	0.627	0.408	19	6.6	62.6	665
95-209-3	95	13.3	3.0	0.271	0.102	0.502	0.439	21	7.1	66.4	765
120-209-3	120	15.3	3.0	0.210	0.0985	0.402	0.492	27	7.4	72.0	930
150-209-3	150	17.2	3.0	0.166	0.0954	0.332	0.541	32	7.8	76.7	1095
185-209-3	185	18.8	3.0	0.137	0.0942	0.288	0.584	42	8.2	82.3	1285
240-209-3	240	21.7	3.0	0.106	0.0906	0.242	0.659	48	8.8	89.6	1555
300-209-3	300	24.3	3.0	0.0849	0.0890	0.213	0.727	63	9.4	97.7	1900
Type 209.6											
16-209-6	16	6.2	5.0	1.58	0.143	2.75	0.181	17	6.4	58.2	475
25-209-6	25	7.2	5.0	0.951	0.137	1.66	0.193	19	6.7	61.7	560
35-209-6	35	8.4	5.0	0.698	0.130	1.23	0.212	21	7.0	64.8	630
50-209-6	50	9.7	5.0	0.523	0.124	0.931	0.234	22	7.3	68.2	715
70-209-6	70	12.0	5.0	0.346	0.116	0.632	0.271	23	7.7	73.8	860
95-209-6	95	13.3	5.0	0.271	0.113	0.509	0.292	30	8.1	78.0	995
120-209-6	120	15.3	5.0	0.210	0.108	0.409	0.325	32	8.5	83.2	1155
150-209-6	150	17.2	5.0	0.166	0.105	0.340	0.354	46	8.9	89.2	1370
185-209-6	185	18.8	5.0	0.136	0.102	0.294	0.381	48	9.3	93.3	1540
240-209-6	240	21.7	5.0	0.106	0.0981	0.250	0.426	53	9.9	101	1825
300-209-6	300	24.3	5.0	0.0845	0.0959	0.221	0.467	71	10.4	109	2195
Type 209.11											
25-209-11	25	7.2	7.6	0.951	0.150	1.67	0.150	24	8.1	75.9	805
35-209-11	35	8.4	7.6	0.698	0.143	1.23	0.163	30	8.4	79.6	915
50-209-11	50	9.7	7.6	0.523	0.136	0.936	0.178	32	8.7	83.0	1010
70-209-11	70	12.0	7.6	0.346	0.127	0.638	0.204	35	9.1	88.7	1185
95-209-11	95	13.3	7.6	0.271	0.124	0.516	0.219	48	9.6	93.8	1360
120-209-11	120	15.3	7.6	0.210	0.119	0.418	0.241	53	9.9	98.7	1540
150-209-11	150	17.2	7.6	0.165	0.114	0.347	0.261	56	10.3	103	1725
185-209-11	185	18.8	7.6	0.136	0.111	0.304	0.279	56	10.7	108	1900
240-209-11	240	21.7	7.6	0.106	0.107	0.261	0.309	77	11.3	116	2280



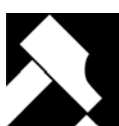
COMPOSITE SCREENED CABLE FOR HAND-HELD EQUIPMENT TO AS/NZS 1802

Composite screened power cores and single extensible pilot. 1.1/1.1kV Cable used primarily for hand-held boring machines, and as a flexible lead to other equipment where heavy duty service is required. Note, certain regulatory authorities limit the use of this cable to 250/250V.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus central pilot
Maximum Continuous Operating Temperature: 90°C

INSULATION:

EPR (R-EP-90)

SCREEN:

Composite screen (earth) of tinned annealed copper wire and polyester yarn
Core Colours Red, White, Blue Braid Tracers

PILOT:

Single, in centre of cable
Pilot resistance is $\leq 5.5 \Omega/100m$

SHEATH:

Heavy Duty HD-85-PCP

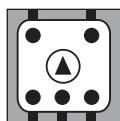
Installation Conditions



IN FREE AIR



IN DUCT



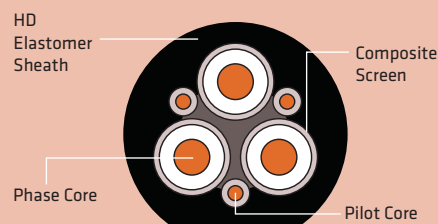
MACHINES

Type 210 1.1kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm	mm	kg/100m
Type 210.1											
1.5-210-1	1.5	1.6	1.4	17.5	0.187	30.3	0.165	6.2	3.0	25.6	100
2.5-210-1	2.5	2.1	1.5	10.5	0.174	18.2	0.184	6.9	3.0	26.8	110

Type 240 1.1-11kV



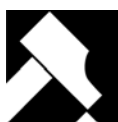
COMPOSITE SCREENED CABLE FOR GENERAL USE TO AS/NZS 1802

Composite screened power cores and three separate pilot conductors. 1.1/1.1kV to 11/11kV Cable used extensively for feeder connection between transformer and gate-end box or similar, continuous miner cable or feeder cables to pumps. Having three pilots, the cable can be used in long runs, without compromising pilot control protection system resistance limitations.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core plus 3 pilots
Maximum Continuous Operating Temperature:	90°C
Conductor Separator Tape:	1.1/1.1kV – polyester 3.3kV and above – semiconductive screen

INSULATION:

EPR (R-EP-90)	
Insulation Tape:	1.1/1.1kV proofed textile 3.3kV and above, semiconductive screen

SCREEN:

Composite screen (earth) of tinned annealed copper wire and polyester yarn
Core Colours Red, White, Blue Braid Tracers

PILOT:

Three in the interstitial cavities
Elastomer covered and proofed taped

SHEATH:

Heavy Duty HD-85-PCP
On request the cable can be provided with a reinforced sheath

Installation Conditions



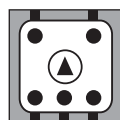
IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT



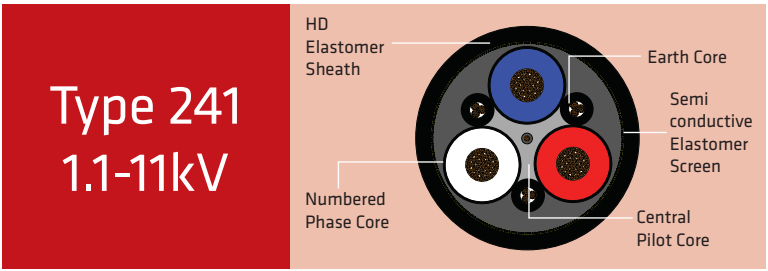
MACHINES

For applications requiring high degrees of flexibility, Type 241 cables (semiconductive screened) would be more appropriate.

Type 240 1.1-11kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Pilot	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Approx Area (Each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm²	mm	mm	kg/100m
Type 240.1												
6-240-1	6	3.5	1.5	4.32	0.141	7.49	0.259	8.2	1	3.8	31.0	150
10-240-1	10	4.6	1.5	2.58	0.130	4.47	0.314	8.2	1.5	3.8	33.3	175
16-240-1	16	6.2	1.6	1.58	0.118	2.74	0.379	10	3	4.0	37.3	230
25-240-1	25	7.2	1.6	0.951	0.112	1.66	0.432	12	4.5	4.3	40.3	295
35-240-1	35	8.4	1.6	0.698	0.107	1.22	0.493	14	6	4.6	43.6	350
50-240-1	50	9.7	1.7	0.523	0.104	0.924	0.526	14	8	5.0	47.7	425
70-240-1	70	12.0	1.8	0.346	0.0981	0.623	0.599	16	12.5	5.4	54.0	565
95-240-1	95	13.3	2.0	0.271	0.0955	0.498	0.591	18	12.5	6.0	58.9	670
120-240-1	120	15.3	2.1	0.210	0.0925	0.397	0.640	21	13.75	6.4	64.6	815
150-240-1	150	17.2	2.3	0.166	0.0907	0.328	0.652	23	17	6.9	70.4	990
185-240-1	185	18.8	2.5	0.137	0.0902	0.284	0.657	30	22	7.4	76.5	1195
240-240-1	240	21.7	2.8	0.107	0.0883	0.240	0.672	34	27	8.2	85.5	1505
300-240-1	300	24.3	3.0	0.0850	0.0873	0.211	0.719	49	35.7	8.8	94.3	1870
Type 240.3												
16-240-3	16	6.2	3.0	1.58	0.131	2.75	0.255	14	3	5.3	47.3	340
25-240-3	25	7.2	3.0	0.951	0.125	1.66	0.280	15	4.5	5.6	50.4	410
35-240-3	35	8.4	3.0	0.698	0.119	1.23	0.311	16	6	5.9	53.5	475
50-240-3	50	9.7	3.0	0.523	0.114	0.927	0.347	17	8	6.3	57.2	555
70-240-3	70	12.0	3.0	0.346	0.106	0.627	0.408	19	12.5	6.6	62.6	690
95-240-3	95	13.3	3.0	0.271	0.102	0.502	0.439	21	12.5	7.1	66.4	785
120-240-3	120	15.3	3.0	0.210	0.0985	0.402	0.492	27	13.75	7.4	72.0	955
150-240-3	150	17.2	3.0	0.166	0.0954	0.332	0.541	32	17	7.8	76.7	1130
185-240-3	185	18.8	3.0	0.137	0.0942	0.288	0.584	42	22	8.2	82.3	1330
240-240-3	240	21.7	3.0	0.106	0.0906	0.242	0.659	48	27	8.8	89.6	1615
300-240-3	300	24.3	3.0	0.0849	0.0890	0.213	0.727	63	35.7	9.4	97.7	1980
Type 240.6												
16-240-6	16	6.2	5.0	1.58	0.143	2.75	0.181	17	3	6.4	58.2	480
25-240-6	25	7.2	5.0	0.951	0.137	1.66	0.193	19	4.5	6.7	61.7	570
35-240-6	35	8.4	5.0	0.698	0.130	1.23	0.212	21	6	7.0	64.8	645
50-240-6	50	9.7	5.0	0.523	0.124	0.931	0.234	22	8	7.3	68.2	730
70-240-6	70	12.0	5.0	0.346	0.116	0.632	0.271	23	12.5	7.7	73.8	880
95-240-6	95	13.3	5.0	0.271	0.113	0.509	0.292	30	12.5	8.1	78.0	1020
120-240-6	120	15.3	5.0	0.210	0.108	0.409	0.325	32	13.75	8.5	83.2	1180
150-240-6	150	17.2	5.0	0.166	0.105	0.340	0.354	46	17	8.9	89.2	1410
185-240-6	185	18.8	5.0	0.136	0.102	0.294	0.381	48	22	9.3	93.6	1585
240-240-6	240	21.7	5.0	0.106	0.0981	0.250	0.426	53	27	9.9	101	1885
300-240-6	300	24.3	5.0	0.0845	0.0959	0.221	0.467	71	35.7	10.4	109	2275
Type 240.11												
25-240-11	25	7.2	7.6	0.951	0.150	1.67	0.150	24	4.5	8.1	75.9	815
35-240-11	35	8.4	7.6	0.698	0.143	1.23	0.163	30	6	8.4	79.6	930
50-240-11	50	9.7	7.6	0.523	0.136	0.936	0.178	32	8	8.7	83.0	1025
70-240-11	70	12.0	7.6	0.346	0.127	0.638	0.204	35	12.5	9.1	88.7	1210
95-240-11	95	13.3	7.6	0.271	0.124	0.516	0.219	48	12.5	9.6	93.8	1385
120-240-11	120	15.3	7.6	0.210	0.119	0.418	0.241	53	13.75	9.9	98.7	1565
150-240-11	150	17.2	7.6	0.165	0.114	0.347	0.261	56	17	10.3	103	1765
185-240-11	185	18.8	7.6	0.136	0.111	0.304	0.279	56	22	10.7	108	1945
240-240-11	240	21.7	7.6	0.106	0.107	0.261	0.309	77	27	11.3	116	2340



SEMICONDUCTIVE SCREENED CABLE FOR GENERAL USE TO AS/NZS 1802

Semiconductive elastomer screened power cores, with three earth cores and one extendible pilot. 1.1/1.1kV to 11/11kV General purpose cable used for continuous miners, or feeder cables to pumps. Also commonly used for monorails supplying DCBs and longwalls. Typically, a more flexible cable for use is a semiconductive screen instead of a metal screen.

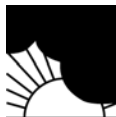
Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core 3 earths plus central pilot
Flexibility:	Flexible
Maximum Continuous Operating Temperature:	90°C
Conductor Separator Type:	1.1/1.1kV - polyester where necessary 3.3kV and above - semiconductive screen

INSULATION:

EPR (R-EP-90) core with durably printed core numbers at intervals less than 300mm, on black semiconductive insulation screen for phase identification

SCREEN:

Semiconductive elastomer screen

PILOT:

Single, in centre of cable. Max. D.C. resistance of 5.5 Ω /100m for power cores to 35mm², and 3 Ω /100m for power conductors above 35mm²

EARTH:

Three semiconductive elastomer covered flexible earths, located in the interstices

SHEATH:

Open weave reinforcement, under heavy duty HD-85-PCP

Installation Conditions



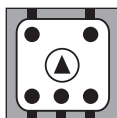
IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT

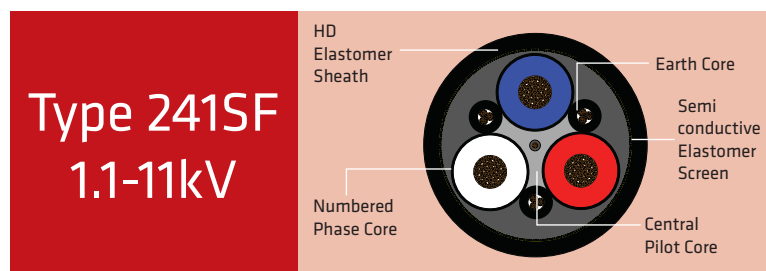


MACHINES

Type 241 1.1-11kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 241.1											
6-241-1	6	3.5	1.5	4.32	0.139	7.49	0.259	1	3.8	29.9	130
10-241-1	10	4.6	1.5	2.58	0.127	4.47	0.314	1.5	3.8	32.0	155
16-241-1	16	6.2	1.6	1.58	0.116	2.74	0.379	3	3.9	35.9	200
25-241-1	25	7.2	1.6	0.951	0.110	1.66	0.432	4.5	4.2	38.9	255
35-241-1	35	8.4	1.6	0.698	0.106	1.22	0.493	6	4.4	42.0	310
50-241-1	50	9.7	1.7	0.523	0.102	0.923	0.526	8	4.9	46.3	380
70-241-1	70	12.0	1.8	0.346	0.0965	0.622	0.599	12.5	5.3	52.4	510
95-241-1	95	13.3	2.0	0.271	0.0942	0.497	0.591	12.5	5.8	57.1	605
120-241-1	120	15.3	2.1	0.210	0.0912	0.397	0.640	13.75	6.3	62.9	745
150-241-1	150	17.2	2.3	0.166	0.0896	0.327	0.652	17	6.7	68.6	910
185-241-1	185	18.8	2.5	0.137	0.0885	0.283	0.657	22	7.3	74.4	1085
240-241-1	240	21.7	2.8	0.107	0.0868	0.239	0.672	27	8.0	83.2	1370
300-241-1	300	24.3	3.0	0.0851	0.0848	0.208	0.719	35.2	8.7	90.8	1670
Type 241.3											
16-241-3	16	6.2	3.0	1.58	0.129	2.75	0.255	3	5.0	45.0	285
25-241-3	25	7.2	3.0	0.951	0.123	1.66	0.280	4.5	5.3	48.2	350
35-241-3	35	8.4	3.0	0.698	0.117	1.23	0.311	6	5.6	51.2	410
50-241-3	50	9.7	3.0	0.523	0.112	0.926	0.347	8	6.0	55.0	485
70-241-3	70	12.0	3.0	0.346	0.105	0.626	0.408	12.5	6.4	60.6	620
95-241-3	95	13.3	3.0	0.271	0.101	0.501	0.439	16	6.8	64.2	715
120-241-3	120	15.3	3.0	0.210	0.0965	0.400	0.492	20	7.2	69.3	855
150-241-3	150	17.2	3.0	0.166	0.0934	0.330	0.541	27	7.6	74.2	1030
185-241-3	185	18.8	3.0	0.137	0.0911	0.285	0.584	35.2	8.0	78.5	1190
240-241-3	240	21.7	3.0	0.107	0.0878	0.240	0.659	39.5	8.6	85.8	1450
300-241-3	300	24.3	3.0	0.0851	0.0854	0.209	0.727	50	9.1	92.3	1735
Type 241.6											
16-241-6	16	6.2	5.0	1.58	0.141	2.75	0.181	3	6.1	55.9	410
25-241-6	25	7.2	5.0	0.951	0.135	1.66	0.193	4.5	6.4	59.4	495
35-241-6	35	8.4	5.0	0.698	0.129	1.23	0.212	6	6.7	62.5	560
50-241-6	50	9.7	5.0	0.523	0.123	0.931	0.234	8	7.1	66.2	645
70-241-6	70	12.0	5.0	0.346	0.115	0.632	0.271	12.5	7.4	71.7	790
95-241-6	95	13.3	5.0	0.271	0.111	0.507	0.292	16	7.9	75.5	905
120-241-6	120	15.3	5.0	0.210	0.106	0.407	0.325	20	8.3	80.6	1065
150-241-6	150	17.2	5.0	0.166	0.102	0.337	0.354	27	8.6	85.1	1235
185-241-6	185	18.8	5.0	0.137	0.0997	0.293	0.381	35.2	9.0	89.5	1410
240-241-6	240	21.7	5.0	0.106	0.0957	0.247	0.426	39.5	9.6	96.8	1685
300-241-6	300	24.3	5.0	0.0847	0.0927	0.217	0.467	50	10.2	104	1995
Type 241.11											
25-241-11	25	7.2	7.6	0.951	0.148	1.67	0.150	4.5	7.8	73.8	720
35-241-11	35	8.4	7.6	0.698	0.141	1.23	0.163	6	8.1	76.8	800
50-241-11	50	9.7	7.6	0.523	0.135	0.936	0.178	8	8.5	80.5	895
70-241-11	70	12.0	7.6	0.346	0.126	0.638	0.204	12.5	8.9	86.1	1060
95-241-11	95	13.3	7.6	0.271	0.122	0.515	0.219	16	9.3	89.7	1180
120-241-11	120	15.3	7.6	0.210	0.116	0.416	0.241	20	9.7	94.8	1350
150-241-11	150	17.2	7.6	0.165	0.112	0.345	0.261	27	10.0	99.3	1540
185-241-11	185	18.8	7.6	0.136	0.109	0.302	0.279	32	10.4	104	1720
240-241-11	240	21.7	7.6	0.106	0.104	0.257	0.309	39.5	11.0	111	2035



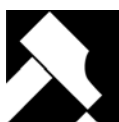
SEMICONDUCTIVE SCREENED CABLE FOR GENERAL USE TO AS/NZS 1802

Semiconductive elastomer screened power cores, with three earth cores and one extensible pilot. 1.1/1.1kV to 11/11kV General purpose cable used for continuous miners, or feeder cables to pumps. Also commonly used for monorails supplying DCBs and longwalls. Cable stranding and lay-up have been modified to provide for maximum flexibility in arduous conditions.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



V Flexible

Cable Design

CORE:

Metal:

Tinned Copper, 3 core 3 earths plus central pilot

Flexibility:

Very flexible for Type 241SF cable

Maximum Continuous Operating Temperature:

90°C

Conductor Separator Type:

1.1/1.1kV - polyester where necessary

3.3kV and above - semiconductive screen

INSULATION:

EPR (R-EP-90) core with durably printed core numbers at intervals less than 300mm, on black semiconductive insulation screen for phase identification

SCREEN:

Semiconductive elastomer screen

PILOT:

Single, in centre of cable. Max. D.C. resistance of 5.5 Ω /100m for power cores to 35mm², and 3 Ω /100m for power conductors above 35mm²

EARTH:

Three semiconductive elastomer covered flexible earths, located in the interstices

SHEATH:

Open weave reinforcement, under heavy duty HD-85-PCP

Installation Conditions



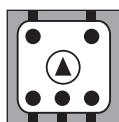
IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT



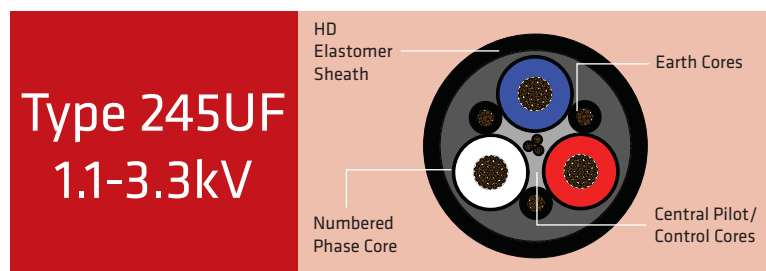
MACHINES

Type 241SF cable designed for applications requiring maximum flexibility.

Type 241SF 1.1-11kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 241.1 SF											
70-241-1 SF	70	12.1	1.8	0.346	0.0985	0.623	0.619	12.5	5.3	52.7	525
95-241-1 SF	95	13.6	2.0	0.271	0.0968	0.498	0.622	12.5	5.8	57.6	635
120-241-1 SF	120	15.6	2.1	0.210	0.0938	0.398	0.673	13.75	6.3	63.6	785
150-241-1 SF	150	17.5	2.3	0.166	0.0922	0.329	0.685	17	6.7	69.2	955
185-241-1 SF	185	19.0	2.5	0.137	0.0898	0.284	0.674	22	7.3	74.8	1115
240-241-1 SF	240	21.9	2.8	0.107	0.0881	0.240	0.689	27	8.0	83.7	1405
300-241-1 SF	300	24.4	3.0	0.0851	0.0862	0.210	0.736	35.7	8.7	91.2	1715
Type 241.3 SF											
70-241-3 SF	70	12.1	3.0	0.346	0.107	0.627	0.422	12.5	6.4	60.9	635
95-241-3 SF	95	13.6	3.0	0.271	0.103	0.502	0.461	16	6.8	64.8	750
120-241-3 SF	120	15.6	3.0	0.210	0.0991	0.402	0.517	20	7.2	70.0	900
150-241-3 SF	150	17.5	3.0	0.166	0.0961	0.332	0.568	27	7.6	74.8	1075
185-241-3 SF	185	19.0	3.0	0.137	0.0924	0.286	0.600	35.2	8.0	78.9	1225
240-241-3 SF	240	21.9	3.0	0.107	0.0891	0.241	0.675	39.5	8.6	86.2	1485
300-241-3 SF	300	24.4	3.0	0.0851	0.0867	0.210	0.744	50	9.1	92.7	1775
Type 241.6 SF											
70-241-6 SF	70	12.1	5.0	0.346	0.118	0.633	0.283	12.5	7.4	72.0	820
95-241-6 SF	95	13.6	5.0	0.271	0.114	0.509	0.307	16	7.9	76.1	945
120-241-6 SF	120	15.6	5.0	0.210	0.109	0.410	0.341	20	8.3	81.3	1110
150-241-6 SF	150	17.5	5.0	0.166	0.105	0.340	0.371	27	8.6	85.8	1290
185-241-6 SF	185	19.0	5.0	0.137	0.101	0.295	0.390	35.2	9.0	89.9	1445
240-241-6 SF	240	21.9	5.0	0.106	0.0971	0.249	0.436	39.5	9.6	97.2	1725
300-241-6 SF	300	24.4	5.0	0.0847	0.0941	0.219	0.478	50	10.2	104	2040
Type 241.11 SF											
70-241-11 SF	70	12.1	7.6	0.346	0.129	0.640	0.212	12.5	8.9	86.4	1090
95-241-11 SF	95	13.6	7.6	0.271	0.125	0.517	0.229	16	9.3	90.3	1225
120-241-11 SF	120	15.6	7.6	0.210	0.119	0.418	0.252	20	9.7	95.5	1405
150-241-11 SF	150	17.5	7.6	0.165	0.115	0.348	0.273	27	10.0	100.0	1600
185-241-11 SF	185	19.0	7.6	0.136	0.110	0.303	0.286	35.2	10.4	104	1765
240-241-11 SF	240	21.9	7.6	0.106	0.106	0.260	0.317	39.5	11.0	111	2080



ULTRA FLEXIBLE CABLE FOR GENERAL USE TO AS/NZS 1802

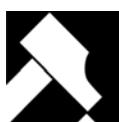
These cables have been designed to operate within the tight bending radii experienced with cable chains used on longwall shearers, and provide additional pilot conductors for modern machine monitoring.

Semiconductive screened power cores, with three earth cores and three extensible pilots for general purpose, and especially for trailing applications in cable chains on Longwall Shearer equipment, and in environments calling for maximum flexibility.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



V Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core 3 earths plus 3 central pilots
Flexibility:	Very flexible
Maximum Continuous Operating Temperature:	90°C
Conductor Separator Type:	3.3kV - semiconductive screen

INSULATION:

EPR (R-EP-90) core with durably printed core numbers at intervals less than 300mm, on black semiconductive insulation screen for phase identification

SCREEN:

Semiconductive elastomer screen

PILOT:

3 pilots, in the centre of the cable. Max. D.C. resistance of 3 Ω/100m for all cables

EARTH:

Three semiconductive elastomer covered flexible earths, located in the interstices

SHEATH:

Open weave reinforcement, under heavy duty HD-85-PCP

Installation Conditions



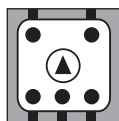
IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT



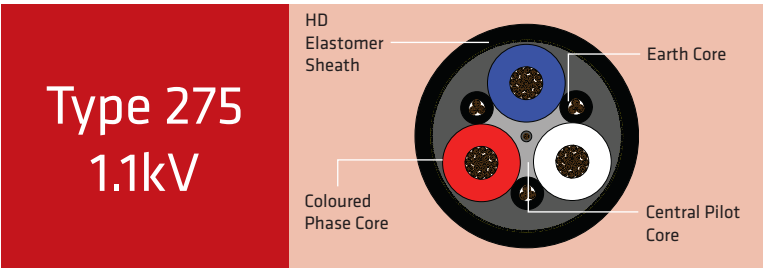
MACHINES

Cables designed for applications requiring maximum flexibility.

Type 245UF 1.1-3.3kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 245.1 UF											
50-245-1 UF	50	9.8	1.7	0.523	0.114	0.927	0.544	8	4.8	49.7	425
70-245-1 UF	70	12.0	1.8	0.346	0.107	0.627	0.614	12.5	5.1	54.9	555
95-245-1 UF	95	13.8	2.0	0.271	0.103	0.502	0.630	12.5	5.6	60.3	675
120-245-1 UF	120	15.9	2.1	0.210	0.0988	0.402	0.684	13.75	6.0	65.7	845
150-245-1 UF	150	17.9	2.3	0.166	0.0956	0.332	0.698	17	6.3	70.8	1010
Type 245.3 UF											
50-245-3 UF	50	9.8	3.0	0.523	0.121	0.930	0.359	8	5.7	57.4	525
70-245-3 UF	70	12.0	3.0	0.346	0.113	0.630	0.418	12.5	6.0	62.3	660
95-245-3 UF	95	13.8	3.0	0.271	0.108	0.505	0.467	16	6.4	66.5	780
120-245-3 UF	120	15.9	3.0	0.210	0.103	0.405	0.525	20	6.7	71.2	950
150-245-3 UF	150	17.9	3.0	0.166	0.0986	0.334	0.578	27	7.0	75.6	1120



SHUTTLE CAR CABLE TO AS/NZS 1802

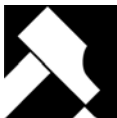
These cables are used with high-speed reeling equipment employed on shuttle cars, and are subject to the greatest exertion underground. Cable constructions are designed to resist “corkscrewing” in these arduous conditions.

Non-individually screened power cores, three earth cores and one extensible pilot, laid-up in a semiconductive cradle and fill to 1.1/1.1kV application.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core 3 earths plus pilot
Maximum Continuous Operating Temperature: 90°C

INSULATION:

EPR (R-EP-90) Core Colours Red, White, Blue

PILOT:

1 pilot, in the centre of the cable. Max. D.C. resistance of 5.5 Ω /100m for power conductors up to 35mm², and 3 Ω /100m for all larger cables

EARTH:

Three semiconductive elastomer covered flexible earths, located in the interstices

SHEATH:

Semiconductive elastomer filled, with an open weave reinforcement, under a heavy duty HD-85-PCP

Installation Conditions



IN FREE AIR



MOBILE
EQUIPMENT

Type 275 1.1kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm ²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm ²	mm	mm	kg/100m
Type 275.1											
16-275-1	16	6.0	1.6	1.58	0.109	2.74	0.377	4.5	3.8	31.8	170
25-275-1	25	7.3	1.6	0.951	0.102	1.66	0.443	6.6	4.0	35.0	225
35-275-1	35	8.9	1.6	0.698	0.0963	1.22	0.521	9	4.3	39.0	285
50-275-1	50	10.2	1.7	0.523	0.0943	0.920	0.551	13.2	4.7	43.3	370

“IT IS EXPECTED THAT THE MANAGEMENT STRUCTURE WILL CLEARLY SHOW THAT THE MANAGER OF ELECTRICAL ENGINEERING (UNDERGROUND MINE) OR THE QUALIFIED ELECTRICAL ENGINEER (OPEN CUT MINE AND/OR PROCESSING PLANT) HAS A SUPERVISORY ROLE OVER ALL PERSONS INVOLVED IN THE SELECTION AND LIFE CYCLE MANAGEMENT OF ELECTRICAL POWERED PLANT AND ELECTRICALLY CONTROLLED PLANT.”

- Electrical Engineering Safety, EES-001, I&I NSW Technical Reference, Electrical Engineering, Management Plan.



Open-Cut & Surface Mining

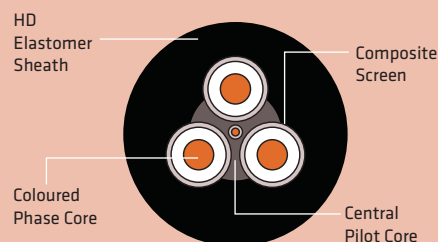
Open-cut and surface mining in the Oceania region can present challenges unique to the region. Extreme UV exposure, tropical downpours, high wall suspension installations and the like mean that careful cable selection and fit for purpose products are a must.

Our cables listed in this section are compliant with relevant standards including AS/NZS 2802 and Prysmian cables manufactured to all allowable configurations have long been regarded as the best product available for the conditions that are faced down under.

It is our belief that a cable made for an extreme environment must be made with extreme durability and the MineMaster has powering surface mining equipment in Australia for decades. We are very comfortable with letting our cables do the talking.



Type 409 1.1-22kV



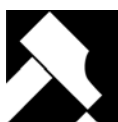
CLASS 2 COMPOSITE SCREENED CABLE WITH CENTRAL PILOT

Composite screened power cores, single extensible pilot. Heavy duty trailing cable with good flexibility and high resistance to abrasion and weathering. Suitable for pumps, shovels, draglines, blasthole drill, etc. For improved performance, all cables (except 409.1 below 50mm) incorporate a polyaramid yarn Kevlar® braid sheath reinforcement for exceptional tear and cut-through resistance. Cable designed for trailing and most reeling applications.

Cable Characteristics



+90°C
-25°C



3



Very Good



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core plus central pilot
Maximum Continuous Operating Temperature:	90°C
Conductor Tape:	1.1/1.1kV – polyester 3.3kV and above – semiconductive screen

INSULATION:

Class 2 EPR (R-EP-90)	
Insulation Tape:	1.1/1.1kV – proofed textile 3.3kV and above – semiconductive screen

SCREEN:

Composite screen (earth) of tinned annealed copper wire and polyester yarn
Core Colours Red, White, Blue

PILOT:

Single, in centre of cable Max. D.C. resistance of 3 Ω/100m for power cores to 35mm², and 2 Ω/100m for power conductors above 35mm²

SHEATH:

Heavy duty HD-85-PCP, incorporating a polyaramid yarn Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR



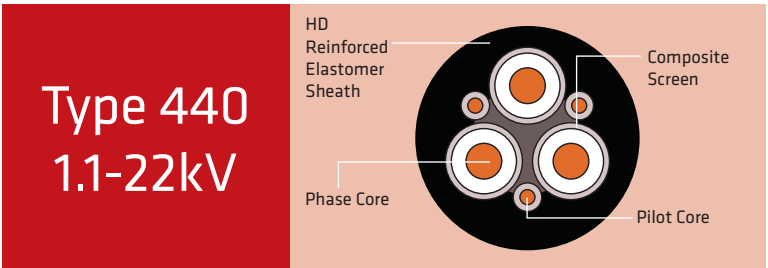
MOBILE
EQUIPMENT

Class 2 cables use standard insulation and sheath materials. For higher performance applications, particularly reeling operations, Class 1 cables with enhanced material properties and smaller dimensions should be used.

Type 409 1.1-22kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	µF/phase/km	mm²/phase	mm	mm	kg/100m
Type 409.1											
6-409-1	6	3.5	1.5	4.32	0.145	7.49	0.259	8.2	3.8	32.2	160
10-409-1	10	4.6	1.5	2.58	0.133	4.47	0.314	8.2	3.8	34.3	185
16-409-1	16	6.2	1.6	1.58	0.120	2.74	0.379	10	4.0	38.1	235
25-409-1	25	7.2	1.6	0.951	0.113	1.66	0.432	12	4.3	40.9	290
35-409-1	35	8.4	1.6	0.698	0.108	1.22	0.493	14	4.6	44.0	345
50-409-1	50	9.7	1.7	0.523	0.107	0.925	0.526	14	5.0	49.1	430
70-409-1	70	12.0	1.8	0.346	0.0997	0.624	0.599	16	5.4	54.8	550
95-409-1	95	13.3	2.0	0.271	0.0971	0.499	0.591	22	6.0	60.0	675
120-409-1	120	15.3	2.1	0.210	0.0932	0.398	0.640	25	6.4	65.2	815
150-409-1	150	17.2	2.3	0.166	0.0928	0.329	0.652	37	6.9	72.3	1025
185-409-1	185	18.8	2.5	0.137	0.0915	0.285	0.657	40	7.4	77.8	1200
240-409-1	240	21.7	2.8	0.106	0.0905	0.241	0.672	58	8.2	88.3	1555
300-409-1	300	24.3	3.0	0.0849	0.0883	0.212	0.719	63	8.8	95.7	1860
Type 409.3											
16-409-3	16	6.2	3.0	1.58	0.131	2.75	0.255	14	5.3	47.4	335
25-409-3	25	7.2	3.0	0.951	0.125	1.66	0.280	15	5.6	50.5	400
35-409-3	35	8.4	3.0	0.698	0.119	1.23	0.311	16	5.9	53.6	460
50-409-3	50	9.7	3.0	0.523	0.115	0.928	0.347	17	6.3	57.8	545
70-409-3	70	12.0	3.0	0.346	0.107	0.627	0.408	19	6.6	62.8	665
95-409-3	95	13.3	3.0	0.271	0.102	0.502	0.439	21	7.1	66.5	765
120-409-3	120	15.3	3.0	0.210	0.0985	0.402	0.492	28	7.4	72.0	935
150-409-3	150	17.2	3.0	0.166	0.0954	0.332	0.541	32	7.8	76.7	1095
185-409-3	185	18.8	3.0	0.137	0.0942	0.288	0.584	42	8.2	82.5	1290
240-409-3	240	21.7	3.0	0.106	0.0906	0.242	0.659	48	8.8	89.8	1560
300-409-3	300	24.3	3.0	0.0849	0.0890	0.213	0.727	63	9.4	97.8	1900
Type 409.6											
16-409-6	16	6.2	5.0	1.58	0.143	2.75	0.181	17	6.4	58.2	475
25-409-6	25	7.2	5.0	0.951	0.137	1.66	0.193	19	6.7	61.7	560
35-409-6	35	8.4	5.0	0.698	0.130	1.23	0.212	21	7.0	64.7	625
50-409-6	50	9.7	5.0	0.523	0.124	0.931	0.234	22	7.3	68.3	715
70-409-6	70	12.0	5.0	0.346	0.116	0.632	0.271	23	7.7	73.9	860
95-409-6	95	13.3	5.0	0.271	0.113	0.509	0.292	30	8.1	78.2	1005
120-409-6	120	15.3	5.0	0.210	0.108	0.409	0.325	32	8.5	83.4	1160
150-409-6	150	17.2	5.0	0.166	0.105	0.340	0.354	46	8.9	89.4	1380
185-409-6	185	18.8	5.0	0.136	0.102	0.294	0.381	49	9.3	93.7	1545
240-409-6	240	21.7	5.0	0.106	0.0981	0.250	0.426	53	9.9	101	1830
300-409-6	300	24.3	5.0	0.0845	0.0959	0.221	0.467	71	10.4	109	2195
Type 409.11											
25-409-11	25	7.2	7.6	0.951	0.150	1.67	0.150	24	8.1	76.1	810
35-409-11	35	8.4	7.6	0.698	0.143	1.23	0.163	30	8.4	79.8	920
50-409-11	50	9.7	7.6	0.523	0.136	0.936	0.178	32	8.7	83.2	1020
70-409-11	70	12.0	7.6	0.346	0.127	0.638	0.204	35	9.1	88.8	1185
95-409-11	95	13.3	7.6	0.271	0.124	0.516	0.219	48	9.6	93.9	1365
120-409-11	120	15.3	7.6	0.210	0.119	0.418	0.241	53	9.9	98.8	1540
150-409-11	150	17.2	7.6	0.165	0.114	0.347	0.261	56	10.3	104	1730
185-409-11	185	18.8	7.6	0.136	0.111	0.304	0.279	56	10.7	108	1900
240-409-11	240	21.7	7.6	0.106	0.107	0.261	0.309	77	11.3	116	2280
Type 409.22											
35-409-22	35	8.4	10.5	0.698	0.160	1.24	0.147	53	10.0	102	1420
50-409-22	50	9.7	10.5	0.523	0.153	0.944	0.159	56	10.3	106	1540
70-409-22	70	12.0	10.5	0.346	0.143	0.648	0.178	60	10.7	111	1735
95-409-22	95	13.3	10.5	0.271	0.138	0.527	0.189	62	11.1	115	1870



CLASS 2 COMPOSITE SCREENED CABLE FOR GENERAL USE

Composite screened power cores, with three pilot cores. Trailing cable having good flexibility, and high resistance to abrasion and weathering. Suitable for long lengths of cable runs, in cases where the use of Type 409 or 441 could result in pilot resistances not meeting requirements. Cable suitable for trailing and most reeling applications.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core plus 3 pilots
Maximum Continuous Operating Temperature:	90°C
Conductor Tape:	1.1/1.1kV – polyester 3.3kV and above – semiconductive screen

INSULATION:

EPR (R-EP-90) white	
Insulation Tape:	1.1/1.1kV – proofed textile 3.3kV and above – semiconductive screen

SCREEN:

Composite screen (earth) of tinned annealed copper wire and polyester yarn
Core Colours Red, White, Blue, Braid Tracers

PILOT:

Three elastomer covered and proofed tape pilots disposed in the cable interstices

SHEATH:

Heavy duty HD-85-PCP incorporating a polyaramid Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR

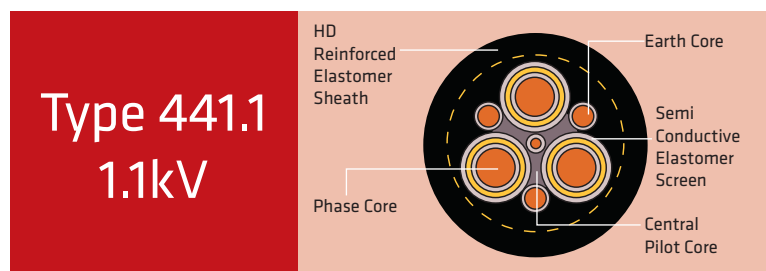


MOBILE
EQUIPMENT

Type 440 1.1-22kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Pilot	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Approx Area (Each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm²	mm	mm	kg/100m
Type 440.1												
6-440-1	6	3.5	1.5	4.32	0.141	7.49	0.259	8.2	1	3.8	31.0	150
10-440-1	10	4.6	1.5	2.58	0.130	4.47	0.314	8.2	1.5	3.8	33.3	175
16-440-1	16	6.2	1.6	1.58	0.118	2.74	0.379	10	3	4.0	37.3	230
25-440-1	25	7.2	1.6	0.951	0.112	1.66	0.432	12	4.5	4.3	40.3	295
35-440-1	35	8.4	1.6	0.698	0.107	1.22	0.493	14	6	4.6	43.6	350
50-440-1	50	9.7	1.7	0.523	0.104	0.924	0.526	14	8	5.0	47.7	425
70-440-1	70	12.0	1.8	0.346	0.0981	0.623	0.599	16	12.5	5.4	54.0	565
95-440-1	95	13.3	2.0	0.271	0.0964	0.498	0.591	22	12.5	6.0	59.5	695
120-440-1	120	15.3	2.1	0.210	0.0932	0.398	0.640	25	13.75	6.4	65.2	845
150-440-1	150	17.2	2.3	0.166	0.0928	0.329	0.652	37	17	6.9	72.3	1065
185-440-1	185	18.8	2.5	0.137	0.0915	0.285	0.657	40	22	7.4	77.8	1245
240-440-1	240	21.7	2.8	0.106	0.0905	0.241	0.672	58	27	8.2	88.1	1610
300-440-1	300	24.3	3.0	0.0849	0.0883	0.212	0.719	63	35.7	8.8	95.5	1930
Type 440.3												
16-440-3	16	6.2	3.0	1.58	0.131	2.75	0.255	14	3	5.3	47.3	340
25-440-3	25	7.2	3.0	0.951	0.125	1.66	0.280	15	4.5	5.6	50.4	410
35-440-3	35	8.4	3.0	0.698	0.119	1.23	0.311	16	6	5.9	53.5	475
50-440-3	50	9.7	3.0	0.523	0.114	0.927	0.347	17	8	6.3	57.2	555
70-440-3	70	12.0	3.0	0.346	0.106	0.627	0.408	19	12.5	6.6	62.6	690
95-440-3	95	13.3	3.0	0.271	0.102	0.502	0.439	21	12.5	7.1	66.4	785
120-440-3	120	15.3	3.0	0.210	0.0985	0.402	0.492	28	13.75	7.4	72.0	960
150-440-3	150	17.2	3.0	0.166	0.0954	0.332	0.541	32	17	7.8	76.7	1130
185-440-3	185	18.8	3.0	0.137	0.0942	0.288	0.584	42	22	8.2	82.3	1330
240-440-3	240	21.7	3.0	0.106	0.0906	0.242	0.659	48	27	8.8	89.6	1615
300-440-3	300	24.3	3.0	0.0849	0.0890	0.213	0.727	63	35.7	9.4	97.7	1980
Type 440.6												
16-440-6	16	6.2	5.0	1.58	0.143	2.75	0.181	17	3	6.4	58.2	480
25-440-6	25	7.2	5.0	0.951	0.137	1.66	0.193	19	4.5	6.7	61.7	570
35-440-6	35	8.4	5.0	0.698	0.130	1.23	0.212	21	6	7.0	64.8	645
50-440-6	50	9.7	5.0	0.523	0.124	0.931	0.234	22	8	7.3	68.2	730
70-440-6	70	12.0	5.0	0.346	0.116	0.632	0.271	23	12.5	7.7	73.8	880
95-440-6	95	13.3	5.0	0.271	0.113	0.509	0.292	30	12.5	8.1	78.0	1020
120-440-6	120	15.3	5.0	0.210	0.108	0.409	0.325	32	13.75	8.5	83.2	1180
150-440-6	150	17.2	5.0	0.166	0.105	0.340	0.354	46	17	8.9	89.2	1410
185-440-6	185	18.8	5.0	0.136	0.102	0.294	0.381	49	22	9.3	93.6	1590
240-440-6	240	21.7	5.0	0.106	0.0981	0.250	0.426	53	27	9.9	101	1885
300-440-6	300	24.3	5.0	0.0845	0.0959	0.221	0.467	71	35.7	10.4	109	2275
Type 440.11												
25-440-11	25	7.2	7.6	0.951	0.150	1.67	0.150	24	4.5	8.1	75.9	815
35-440-11	35	8.4	7.6	0.698	0.143	1.23	0.163	30	6	8.4	79.6	930
50-440-11	50	9.7	7.6	0.523	0.136	0.936	0.178	32	8	8.7	83.0	1025
70-440-11	70	12.0	7.6	0.346	0.127	0.638	0.204	35	12.5	9.1	88.7	1210
95-440-11	95	13.3	7.6	0.271	0.124	0.516	0.219	48	12.5	9.6	93.8	1385
120-440-11	120	15.3	7.6	0.210	0.119	0.418	0.241	53	13.75	9.9	98.7	1565
150-440-11	150	17.2	7.6	0.165	0.114	0.347	0.261	56	17	10.3	103	1765
185-440-11	185	18.8	7.6	0.136	0.111	0.304	0.279	56	22	10.7	108	1945
Type 440.22												
35-440-22	35	8.4	10.5	0.698	0.160	1.24	0.147	53	6	10.0	102	1430
50-440-22	50	9.7	10.5	0.523	0.153	0.944	0.159	56	8	10.3	106	1550
70-440-22	70	12.0	10.5	0.346	0.143	0.648	0.178	60	12.5	10.7	111	1755
95-440-22	95	13.3	10.5	0.271	0.138	0.527	0.189	62	12.5	11.1	115	1890



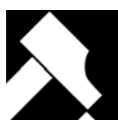
CLASS 2 SEMICONDUCTIVE SCREENED CABLE FOR GENERAL USE

Semiconductive elastomer screened power cores with three earth cores and one pilot core, cable is suitable for trailing and most reeling applications and is used for general purpose supply.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus 3 earths
Maximum Continuous Operating Temperature: 90°C

INSULATION:

EPR (R-EP-90) Core, identification by printed numbers on black semiconductive elastomer insulation screen

EARTH:

Three, semiconductive elastomer covered, disposed in the cable interstices

PILOT:

One EPR cover tinned annealed copper central extensible conductor

SHEATH:

Heavy duty HD-85-PCP, incorporating a polyaramid Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR

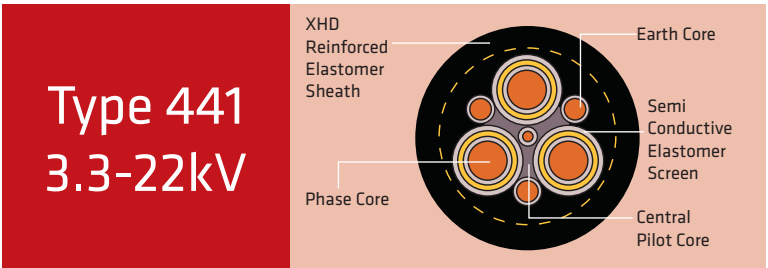


MOBILE
EQUIPMENT

Type 441.1 1.1kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 441.1											
6-441-1	6	3.5	1.5	4.32	0.143	7.49	0.259	2.1	3.8	30.7	140
10-441-1	10	4.6	1.5	2.58	0.130	4.47	0.314	3.4	3.8	32.8	165
16-441-1	16	6.2	1.6	1.58	0.118	2.74	0.379	5.3	3.9	36.5	210
25-441-1	25	7.2	1.6	0.951	0.111	1.66	0.432	5.3	4.2	39.3	260
35-441-1	35	8.4	1.6	0.698	0.106	1.22	0.493	5.3	4.4	42.2	305
50-441-1	50	9.7	1.7	0.523	0.105	0.924	0.526	8	4.9	47.5	395
70-441-1	70	12.0	1.8	0.346	0.0984	0.623	0.599	12.5	5.3	53.2	520
95-441-1	95	13.3	2.0	0.271	0.0953	0.498	0.591	16	5.8	57.6	620
120-441-1	120	15.3	2.1	0.210	0.0914	0.397	0.640	20	6.3	63.1	765
150-441-1	150	17.2	2.3	0.166	0.0896	0.327	0.652	27	6.7	68.6	935
185-441-1	185	18.8	2.5	0.137	0.0885	0.283	0.657	32	7.3	74.4	1115
240-441-1	240	21.7	2.8	0.107	0.0848	0.236	0.672	39.5	8.0	82.2	1385
300-441-1	300	24.3	3.0	0.0853	0.0823	0.205	0.719	50	8.7	89.4	1680



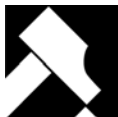
CLASS 1 SEMICONDUCTIVE SCREENED CABLE FOR GENERAL USE

Semiconductive elastomer screened power cores with three earth cores and one pilot core, general purpose cable. Being a class 1 cable, this cable has lower insulation and sheath radials than class 2, and is suitable for use with materials handling equipment, and applications that call for a smaller overall diameter and mass for reeling and trailing applications. The cables are finished with a polyaramid yarn Kevlar® braid sheath reinforcement for exceptional tear and cut-through resistance. This cable is suitable for slow reeling and trailing applications.

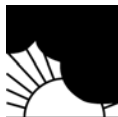
Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus 3 earths
Maximum Continuous Operating Temperature: 90°C

INSULATION:

XR-EP-90 core identification by printed numbers on black semiconductive elastomer insulation screen

EARTH:

Three, elastomer covered tinned annealed copper cores disposed in the cable interstices

PILOT:

One EPR covered central extensible core . Maximum DC resistance of 3 Ω /100m for power conductor sizes up to 35mm², and 2 Ω /100m for power conductor sizes greater than 35mm²

SHEATH:

Extra heavy duty XHD-85-PCP, incorporating a polyaramid Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR



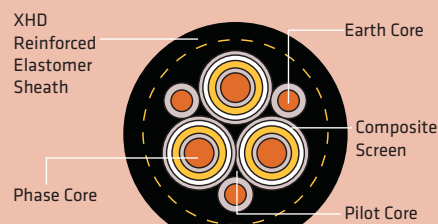
MOBILE
EQUIPMENT

Type 441 3.3-22kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 441.3											
25-441-3	25	7.2	2.2	0.951	0.120	1.66	0.395	5.3	4.9	45.9	320
35-441-3	35	8.4	2.2	0.698	0.115	1.23	0.437	5.3	5.2	48.8	370
50-441-3	50	9.7	2.4	0.523	0.113	0.927	0.450	8	5.7	54.4	470
70-441-3	70	12.0	2.4	0.346	0.105	0.626	0.525	12.5	6.0	59.5	595
95-441-3	95	13.3	2.4	0.271	0.100	0.500	0.563	16	6.3	62.7	685
120-441-3	120	15.3	2.4	0.210	0.0959	0.400	0.628	20	6.5	67.2	815
150-441-3	150	17.2	2.4	0.166	0.0929	0.329	0.687	27	6.6	71.3	965
185-441-3	185	18.8	2.4	0.137	0.0906	0.284	0.741	32	6.7	75.1	1105
240-441-3	240	21.7	2.4	0.107	0.0874	0.239	0.833	39.5	6.9	81.6	1350
300-441-3	300	24.3	2.4	0.0851	0.0850	0.208	0.917	50	7.0	87.4	1620
Type 441.6											
25-441-6	25	7.2	3.0	0.951	0.126	1.66	0.309	5.3	5.3	50.2	370
35-441-6	35	8.4	3.0	0.698	0.121	1.23	0.340	5.3	5.6	53.3	425
50-441-6	50	9.7	3.0	0.523	0.116	0.928	0.375	8	6.0	57.6	515
70-441-6	70	12.0	3.0	0.346	0.108	0.628	0.435	12.5	6.3	62.6	640
95-441-6	95	13.3	3.0	0.271	0.103	0.502	0.465	16	6.4	65.5	725
120-441-6	120	15.3	3.0	0.210	0.0990	0.402	0.518	20	6.6	70.1	860
150-441-6	150	17.2	3.0	0.166	0.0958	0.332	0.566	27	6.7	74.2	1015
185-441-6	185	18.8	3.0	0.137	0.0934	0.287	0.608	32	6.8	78.0	1155
240-441-6	240	21.7	3.0	0.106	0.0899	0.241	0.682	39.5	7.0	84.6	1410
300-441-6	300	24.3	3.0	0.0849	0.0877	0.211	0.754	50	7.1	90.4	1680
Type 441.11											
25-441-11	25	7.2	5.0	0.951	0.137	1.66	0.217	5.3	6.3	60.9	500
35-441-11	35	8.4	5.0	0.698	0.131	1.23	0.236	5.3	6.4	63.6	555
50-441-11	50	9.7	5.0	0.523	0.124	0.931	0.258	8	6.5	66.7	635
70-441-11	70	12.0	5.0	0.346	0.116	0.632	0.296	12.5	6.6	71.6	765
95-441-11	95	13.3	5.0	0.271	0.112	0.508	0.317	16	6.8	74.8	870
120-441-11	120	15.3	5.0	0.210	0.108	0.409	0.350	20	6.9	79.3	1010
150-441-11	150	17.2	5.0	0.166	0.104	0.339	0.381	27	7.0	83.6	1180
185-441-11	185	18.8	5.0	0.137	0.101	0.295	0.407	32	7.1	87.2	1320
240-441-11	240	21.7	5.0	0.106	0.0970	0.249	0.453	39.5	7.3	93.8	1585
300-441-11	300	24.3	5.0	0.0846	0.0942	0.219	0.499	50	7.5	100.0	1880
Type 441.22											
35-441-22	35	8.4	7.6	0.698	0.143	1.23	0.178	5.3	6.9	76.0	750
50-441-22	50	9.7	7.6	0.523	0.136	0.936	0.194	8	7.0	79.2	840
70-441-22	70	12.0	7.6	0.346	0.127	0.638	0.219	12.5	7.1	84.1	980
95-441-22	95	13.3	7.6	0.271	0.123	0.515	0.234	16	7.2	87.0	1085
120-441-22	120	15.3	7.6	0.210	0.118	0.417	0.256	20	7.3	91.7	1245
150-441-22	150	17.2	7.6	0.165	0.113	0.346	0.276	27	7.4	95.8	1415
185-441-22	185	18.8	7.6	0.136	0.110	0.303	0.294	32	7.6	99.8	1580
240-441-22	240	21.7	7.6	0.106	0.105	0.258	0.325	39.5	7.7	106	1850

Type 450 3.3-33kV



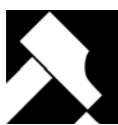
CLASS 1 COMPOSITE SCREENED CABLE FOR GENERAL USE

Composite screened power cores with two earth and one pilot cores, general purpose cable. 3.3/3.3kV to 33/33kV reeling cables for use with drag-lines, shovels, excavators, wharf cranes, and materials handling equipment. This cable is suitable for slow reeling and trailing applications.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus 2 earths and 1 pilot

Maximum Continuous Operating Temperature: 90°C

Semiconductive barrier taped and elastomer screened

INSULATION:

EPR (XR-EP-90) Semiconductive elastomer screened

SCREEN:

Composite tinned annealed copper wire and polyester yarn screen, under a semiconductive tape
Core Colours Red, White, Blue, Braid Tracers

EARTH:

Two, elastomer covered tinned annealed copper wire earths disposed in the cable interstices

PILOT:

One, elastomer covered tinned annealed copper wire pilot disposed in the cable interstices

SHEATH:

Extra heavy duty XHD-85-PCP, incorporating a polyaramid braid reinforcement

Installation Conditions



IN FREE AIR



MOBILE
EQUIPMENT

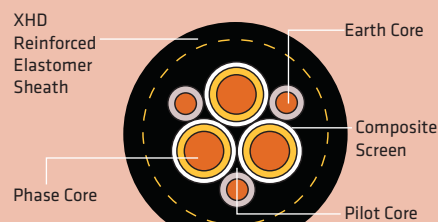
Type 450 3.3-33kV

Physical & Electrical Characteristics

	Power Conductor							Screen	Earth & Pilot	Cable		
Voltage Rating & Part Number	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm²	mm	mm	kg/100m
Type 450.3												
25-450-3	25	7.2	2.2	0.951	0.118	1.66	0.395	7.9	8	4.8	46.7	355
35-450-3	35	8.4	2.2	0.698	0.113	1.22	0.437	8.5	8	5.1	49.7	415
50-450-3	50	9.7	2.4	0.523	0.109	0.925	0.450	9.3	12	5.6	54.5	515
70-450-3	70	12.0	2.4	0.346	0.103	0.625	0.525	14	18	6.0	60.5	660
95-450-3	95	13.3	2.4	0.271	0.0986	0.500	0.563	15	25	6.3	63.9	765
120-450-3	120	15.3	2.4	0.210	0.0947	0.399	0.628	16	31	6.4	68.4	900
150-450-3	150	17.2	2.4	0.166	0.0918	0.329	0.687	17	39.5	6.6	72.8	1070
185-450-3	185	18.8	2.4	0.137	0.0896	0.284	0.741	18	50	6.7	76.5	1225
240-450-3	240	21.7	2.4	0.107	0.0867	0.239	0.833	25	60	6.9	83.3	1485
300-450-3	300	24.3	2.4	0.0851	0.0844	0.208	0.917	27	80	7.0	89.0	1800
Type 450.6												
25-450-6	25	7.2	3.0	0.951	0.124	1.66	0.309	8.8	8	5.2	51.1	410
35-450-6	35	8.4	3.0	0.698	0.118	1.23	0.340	9.3	8	5.5	54.2	470
50-450-6	50	9.7	3.0	0.523	0.113	0.927	0.375	10	12	5.9	57.8	560
70-450-6	70	12.0	3.0	0.346	0.106	0.627	0.435	15	18	6.3	63.9	710
95-450-6	95	13.3	3.0	0.271	0.102	0.502	0.465	16	25	6.4	66.8	810
120-450-6	120	15.3	3.0	0.210	0.0979	0.401	0.518	17	31	6.5	71.4	950
150-450-6	150	17.2	3.0	0.166	0.0948	0.331	0.566	18	39.5	6.6	75.5	1120
185-450-6	185	18.8	3.0	0.137	0.0923	0.286	0.608	20	50	6.8	79.3	1280
240-450-6	240	21.7	3.0	0.106	0.0893	0.240	0.682	27	60	7.0	86.2	1545
300-450-6	300	24.3	3.0	0.0850	0.0871	0.211	0.754	29	80	7.1	92.3	1875
Type 450.11												
25-450-11	25	7.2	5.0	0.951	0.136	1.66	0.217	14	8	6.3	62.3	565
35-450-11	35	8.4	5.0	0.698	0.129	1.23	0.236	15	8	6.4	65.0	625
50-450-11	50	9.7	5.0	0.523	0.123	0.931	0.258	16	12	6.5	68.1	715
70-450-11	70	12.0	5.0	0.346	0.115	0.632	0.296	17	18	6.6	73.1	855
95-450-11	95	13.3	5.0	0.271	0.111	0.507	0.317	18	25	6.7	76.1	965
120-450-11	120	15.3	5.0	0.210	0.107	0.408	0.350	20	31	6.9	80.7	1115
150-450-11	150	17.2	5.0	0.166	0.103	0.338	0.381	26	39.5	7.0	85.2	1315
185-450-11	185	18.8	5.0	0.137	0.100	0.294	0.407	27	50	7.1	89.0	1485
240-450-11	240	21.7	5.0	0.106	0.0964	0.248	0.453	30	60	7.3	95.5	1745
300-450-11	300	24.3	5.0	0.0846	0.0937	0.219	0.499	32	80	7.4	101	2080
Type 450.22												
35-450-22	35	8.4	7.6	0.698	0.142	1.23	0.178	19	8	6.8	77.2	835
50-450-22	50	9.7	7.6	0.523	0.135	0.936	0.194	20	12	6.9	80.2	930
70-450-22	70	12.0	7.6	0.346	0.127	0.638	0.219	27	18	7.0	85.6	1105
95-450-22	95	13.3	7.6	0.271	0.122	0.515	0.234	27	25	7.2	88.9	1230
120-450-22	120	15.3	7.6	0.210	0.117	0.416	0.256	29	31	7.3	93.4	1395
150-450-22	150	17.2	7.6	0.165	0.113	0.346	0.276	31	39.5	7.4	97.5	1580
185-450-22	185	18.8	7.6	0.136	0.110	0.303	0.294	32	50	7.5	101	1760
240-450-22	240	21.7	7.6	0.106	0.105	0.258	0.325	34	60	7.7	108	2035

*33kV available on request.

Type 451 3.3-33kV



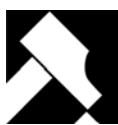
CLASS 1 COMPOSITE SCREENED CABLE FOR GENERAL USE

Composite screened power cores with two earth and one pilots cores, general purpose cable. 3.3/3.3kV to 33/33kV reeling cables similar to Type 450 cables but with reduced pilot size, for use with drag-lines, shovels, excavators, wharf cranes, and materials handling equipment. This cable is suitable for slow reeling and trailing applications.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus 2 earths and 1 pilot

Maximum Continuous Operating Temperature: 90°C

Semiconductive barrier taped and elastomer screened

INSULATION:

EPR (XR-EP-90) Semiconductive elastomer screened

SCREEN:

Composite tinned annealed copper wire and polyester yarn screen under a semiconductive tape
Core Colours Red, White, Blue, Braid Tracers

EARTH:

Two, elastomer covered, disposed in the cable interstices

PILOT:

One, elastomer covered, disposed in the cable interstices

SHEATH:

Extra heavy duty XHD-85-PCP, incorporating a polyaramid Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR



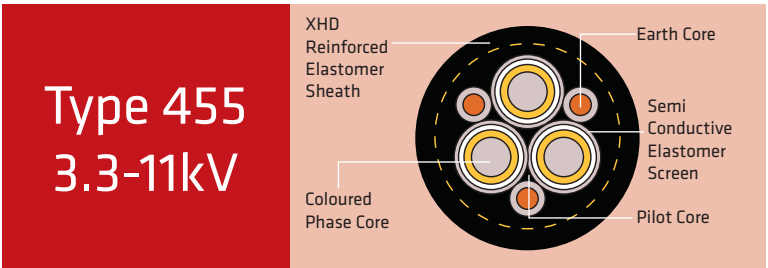
MOBILE
EQUIPMENT

Type 451 3.3-33kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Earth	Pilot	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area	Approx Area (each)	Approx Area	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²/phase	mm²	mm²	mm	mm	kg/100m
Type 451.3													
25-451-3	25	7.2	2.2	0.951	0.118	1.66	0.395	7.9	8	9	4.8	46.7	360
35-451-3	35	8.4	2.2	0.698	0.113	1.22	0.437	8.5	8	9	5.1	49.7	415
50-451-3	50	9.7	2.4	0.523	0.109	0.925	0.450	9.3	12	9	5.6	54.5	510
70-451-3	70	12.0	2.4	0.346	0.103	0.625	0.525	14	18	9	6.0	60.5	655
95-451-3	95	13.3	2.4	0.271	0.0986	0.500	0.563	15	25	9	6.3	63.9	755
120-451-3	120	15.3	2.4	0.210	0.0947	0.399	0.628	16	31	13.2	6.4	68.4	890
150-451-3	150	17.2	2.4	0.166	0.0918	0.329	0.687	17	39.5	13.2	6.6	72.8	1050
Type 451.6													
25-451-6	25	7.2	3.0	0.951	0.124	1.66	0.309	8.8	8	9	5.2	51.1	415
35-451-6	35	8.4	3.0	0.698	0.118	1.23	0.340	9.3	8	9	5.5	54.2	470
50-451-6	50	9.7	3.0	0.523	0.113	0.927	0.375	10	12	9	5.9	57.8	555
70-451-6	70	12.0	3.0	0.346	0.106	0.627	0.435	15	18	9	6.3	63.9	705
95-451-6	95	13.3	3.0	0.271	0.102	0.502	0.465	16	25	9	6.4	66.8	800
120-451-6	120	15.3	3.0	0.210	0.0979	0.401	0.518	17	31	13.2	6.5	71.4	940
150-451-6	150	17.2	3.0	0.166	0.0948	0.331	0.566	18	39.5	13.2	6.6	75.5	1100
Type 451.11													
25-451-11	25	7.2	5.0	0.951	0.136	1.66	0.217	14	8	13.2	6.3	62.3	570
35-451-11	35	8.4	5.0	0.698	0.129	1.23	0.236	15	8	13.2	6.4	65.0	630
50-451-11	50	9.7	5.0	0.523	0.123	0.931	0.258	16	12	13.2	6.5	68.1	715
70-451-11	70	12.0	5.0	0.346	0.115	0.632	0.296	17	18	13.2	6.6	73.1	850
95-451-11	95	13.3	5.0	0.271	0.111	0.507	0.317	18	25	13.2	6.7	76.1	955
120-451-11	120	15.3	5.0	0.210	0.107	0.408	0.350	20	31	13.2	6.9	80.7	1105
150-451-11	150	17.2	5.0	0.166	0.103	0.338	0.381	26	39.5	13.2	7.0	85.2	1295
Type 451.22													
35-451-22	35	8.4	7.6	0.698	0.142	1.23	0.178	19	8	13.2	6.8	77.2	840
50-451-22	50	9.7	7.6	0.523	0.135	0.936	0.194	20	12	13.2	6.9	80.2	930
70-451-22	70	12.0	7.6	0.346	0.127	0.638	0.219	27	18	13.2	7.0	85.6	1100
95-451-22	95	13.3	7.6	0.271	0.122	0.515	0.234	27	25	13.2	7.2	88.9	1220
120-451-22	120	15.3	7.6	0.210	0.117	0.416	0.256	29	31	13.2	7.3	93.4	1380
150-451-22	150	17.2	7.6	0.165	0.113	0.346	0.276	31	39.5	13.2	7.4	97.5	1560

*33kV available on request.



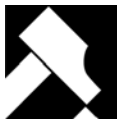
CLASS 1 SEMICONDUCTIVE SCREENED CABLE FOR GENERAL USE

Semiconductive elastomer screened power cores with two earth and one pilot cores, general purpose cable. 3.3/3.3kV to 11/11kV reeling cables for use with drag-lines, shovels, excavators, wharf cranes, and materials handling equipment. The cable is similar to Type 450 cables, without a composite insulation screen. This cable is suitable for slow reeling and trailing applications.

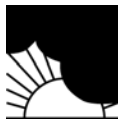
Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Copper, 3 core plus 2 earths and 1 pilot
Maximum Continuous Operating Temperature: 90°C

INSULATION:

EPR (XR-EP-90) Semiconductive elastomer screened, with numbered cores

EARTH:

Two, elastomer covered, disposed in the cable interstices

PILOT:

One, elastomer covered, disposed in the cable interstices

SHEATH:

Extra heavy duty XHD-85-PCP, incorporating a polyaramid Kevlar® braid reinforcement

Installation Conditions



IN FREE AIR



MOBILE
EQUIPMENT

Type 455 3.3-11kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Earth & Pilot	Cable		
	Nominal Area	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Capacitance to Earth	Approx Area (each)	Sheath Thickness	Nominal Diameter	Approx Mass
	mm²	mm	mm	Ω/km	Ω/km	mV/A.m	μF/phase/km	mm²	mm	mm	kg/100m
Type 455.3											
25-455-3	25	7.3	2.2	0.951	0.112	1.66	0.404	8	4.5	42.2	300
35-455-3	35	8.9	2.2	0.698	0.105	1.22	0.462	8	4.8	46.2	360
50-455-3	50	10.2	2.4	0.523	0.103	0.923	0.473	12	5.2	50.7	455
70-455-3	70	12.7	2.4	0.346	0.0964	0.622	0.555	18	5.7	56.9	585
95-455-3	95	13.8	2.4	0.271	0.0941	0.497	0.593	25	6.1	60.2	700
120-455-3	120	15.7	2.4	0.210	0.0915	0.397	0.633	31	6.4	65.3	850
150-455-3	150	17.6	2.4	0.166	0.0884	0.326	0.719	39.5	6.5	69.1	1010
Type 455.6											
25-455-6	25	7.3	3.0	0.951	0.119	1.66	0.316	8	5.0	46.8	345
35-455-6	35	8.9	3.0	0.698	0.112	1.22	0.359	8	5.3	50.9	415
50-455-6	50	10.2	3.0	0.523	0.107	0.925	0.394	12	5.6	54.2	500
70-455-6	70	12.7	3.0	0.346	0.100	0.624	0.459	18	6.0	60.2	635
95-455-6	95	13.8	3.0	0.271	0.0978	0.499	0.490	25	6.3	63.3	745
120-455-6	120	15.7	3.0	0.210	0.0944	0.399	0.540	31	6.5	67.7	890
150-455-6	150	17.6	3.0	0.166	0.0916	0.328	0.591	39.5	6.6	72.0	1055
Type 455.11											
25-455-11	25	7.3	5.0	0.951	0.132	1.66	0.223	8	6.1	57.6	480
35-455-11	35	8.9	5.0	0.698	0.124	1.23	0.251	8	6.3	61.5	550
50-455-11	50	10.2	5.0	0.523	0.119	0.929	0.273	12	6.4	64.4	640
70-455-11	70	12.7	5.0	0.346	0.111	0.629	0.314	18	6.5	69.8	775
95-455-11	95	13.8	5.0	0.271	0.108	0.505	0.334	25	6.7	72.7	890
120-455-11	120	15.7	5.0	0.210	0.104	0.406	0.365	31	6.8	77.0	1040
150-455-11	150	17.6	5.0	0.166	0.100	0.336	0.397	39.5	6.9	81.3	1215

“HIGH/MEDIUM VOLTAGE ARMOURED PAPER LEAD AND
ARMOURED XLPE (CROSS LINKED POLYMER) CABLES”



Mine Feeder Cables

The Mine Feeder Cable range includes high/medium voltage armoured paper lead and armoured XLPE (cross linked polymer) cables as well as machine cables manufactured to AS/NZ1972.

These cables are used for specific applications in underground coal mines such as lighting, conveyors, pumps, machine and general reticulation of supply. Many of these cables are also suitable for above ground and other general mining applications.



11/11kV
Paper
Insulated



3 CORE BELTED PAPER INSULATED CABLE TO AS1026 AND AS/NZS 1972

High voltage feeder cables used in power reticulation throughout the mine. 11/11kV paper insulated, paper belted, lead sheathed, GSW armoured, PVC sheathed cable. Suitable as primary supply for mines and industrial networks.

Cable Characteristics



+65°C
-0°C



4



Excellent



Immersion



Very Good



C3



Rigid

Cable Design

CORE:

Metal: Compacted shaped plain annealed copper conductor
Maximum Continuous Operating Temperature: 65°C
 Semiconductive tape screen

INSULATION:

Impregnated paper tape insulated (numbered), overall paper tape belt insulated

INNER SHEATH:

Lead alloy

BEDDING:

Bitumen impregnated paper and textile tape

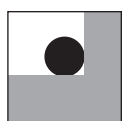
ARMOUR:

Galvanised steel wire armour. The armour is designed to provide not less than 50% conductance of the power conductor

OUTER SHEATH:

PVC (red)

Installation Conditions



IN FREE AIR



IN DUCT



BURIED
DIRECT

Note: 12.7/22kV XPLE cable can be used as an alternative, with gains in temperature rating generally allowing a reduction in cable size, with consequent savings in cost, size and weight.

11/11kV
Paper
Insulated

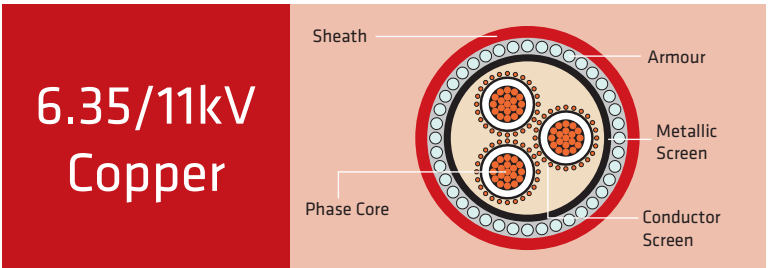
Physical Characteristics

Conductor		Nominal Overall Diameter mm	Approx. Cable Mass kg/100m	Minimum Installed Bend Radius mm
mm ²	Shape			
16	Circular	47.6	551	570
25	Circular	49	632	590
35	Circular	50.3	673	600
50	Sector	53	748	640
70	Sector	56.3	873	680
95	Sector	60	1021	720
120	Sector	62.1	1122	750
150	Sector	65.1	1268	780
185	Sector	69.9	1542	840
240	Sector	74.8	1793	900
300	Sector	79.8	2119	960
400	Sector	86.3	2505	1040
500	Sector	92.2	3003	1110

11/11kV
Paper
Insulated

Electrical Characteristics

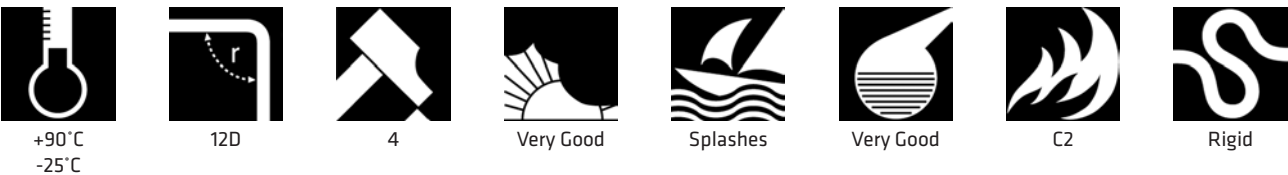
Core	Current Rating			Electrical Characteristics					
Area mm ²	In Air A	In Ground A	In Ducts A	DC ohm	AC ohm	Inductance	Capacitance	Star Reactance	Volt drop
16	61	75	67	1.15	1.35	0.398	0.165	0.125	2.35
25	79	96	86	0.727	0.856	0.344	0.212	0.108	1.49
35	95	115	102	0.524	0.617	0.323	0.242	0.102	1.08
50	120	143	126	0.387	0.456	0.292	0.29	0.092	0.805
70	149	176	154	0.268	0.316	0.28	0.328	0.088	0.568
95	182	211	185	0.193	0.228	0.27	0.367	0.085	0.421
120	208	240	210	0.153	0.181	0.264	0.398	0.083	0.345
150	236	270	239	0.124	0.147	0.255	0.435	0.08	0.29
185	269	303	269	0.0991	0.118	0.25	0.474	0.078	0.246
240	318	353	313	0.0754	0.091	0.242	0.525	0.076	0.205
300	362	396	351	0.0601	0.073	0.238	0.573	0.075	0.181
400	419	450	398	0.047	0.059	0.234	0.642	0.073	0.162
500	481	509	456	0.0366	0.047	0.229	0.715	0.072	0.149



3 CORE COPPER WIRE SCREENED ARMoured TO AS/NZS 1972

6.35/11kV XLPE insulated, screened, GSW armoured, PVC sheathed cable. Suitable as primary supply for mines and industrial networks.

Cable Characteristics



Cable Design

CORE:

Metal: Plain circular compacted copper
Maximum Continuous Operating Temperature: 90°C

CONDUCTOR SCREEN:

Extruded semi-conducting compound, bonded to the insulation and applied in the same operation as the insulation

INSULATION:

Cross Linked Polyethylene (XLPE) - standard

INSULATION SCREEN:

Extruded semi-conducting compound

METALLIC SCREEN:

Plain annealed copper wire. Combined screen area is designed to provide not less than 50% conductance of one associated power conductor

ARMOUR:

Galvanised steel wires

OUTER SHEATH:

Red 5V-90 polyvinyl chloride (PVC)

Installation Conditions



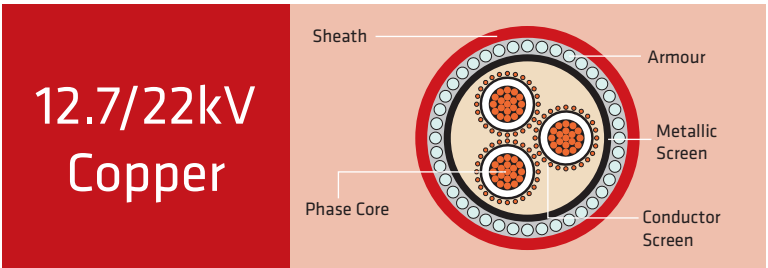
Note: The cables in this brochure are not specifically designed for use as self supporting cables, as submarine cables or where exposure to excessive heat and/or corrosive products is involved. In case of any doubt concerning the suitability of a particular cable type for a particular application, guidance should be sought from the Prysmian Customer Service Team.

6.35/11kV Copper

Characteristics

Product Code	25XFED3C11	35XFED3C11	50XFED3C11	70XFED3C11	95XFED3C11	120XFED3C11	150XFED3C11	185XFED3C11	240XFED3C11
Nominal Conductor Area mm ²	25	35	50	70	95	120	150	185	240
Nominal Conductor Diameter mm	6.1	7.0	8.2	9.8	11.5	12.9	14.3	16.0	18.2
Nominal Diameter Under Armour	40.9	42.9	45.5	49.4	53.2	56.3	59.5	66.0	71.2
Nominal Wire Armour Diameter mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15
Nominal Diameter mm	51.3	53.5	56.3	60.4	64.4	67.9	71.3	79.5	85.1
Nominal Mass kg/100m	425	475	539	646	778	888	1009	1286	1533
Pulling Tension: Cond(s) kN	5.3	7.4	10.5	14.7	20.0	25.0	25.0	25.0	25.0
Pulling Tension: Stocking kN	5.3	7.4	10.5	12.8	14.5	16.1	17.8	22.1	25
Pulling Tension: Armour Wires kN	10.52	11.46	12.75	14.77	16.95	18.75	20.6	25.0	25.0
Min Bending Radius During Install mm	920	960	1010	1090	1160	1220	1280	1430	1530
Min Bending Radius Set In Position mm	615	640	676	725	773	814	855	954	1020
Rdc @ Ref Temp: Phase Cond Ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754
Rac @ Oper Temp: Phase Conductor	0.927	0.668	0.494	0.342	0.247	0.196	0.159	0.128	0.0983
Inductance mH/km	0.415	0.397	0.379	0.349	0.333	0.319	0.310	0.309	0.298
Inductance Reactance Ohm/km	0.130	0.124	0.119	0.109	0.104	0.100	0.097	0.097	0.0937
Zo @ Ref temp: Ro Ohm/km	4.00+j0.084	3.51+j0.018	2.51+j0.073	1.76+j0.063	1.29+j0.059	1.02+j0.054	0.82+j0.051	0.66+j0.050	0.52+j0.047
Capacitance: Phase To Earth uF/km	0.211	0.230	0.254	0.289	0.324	0.353	0.382	0.418	0.465
Capacitance: Charging curr. per phase A/km	0.42	0.46	0.51	0.58	0.65	0.70	0.76	0.83	0.92
ISC: Phase Cond. kA, 1 sec	3.6	5.0	7.2	10.0	13.6	17.2	21.5	26.5	34.3
In Ground, Direct Buried A	145	172	202	246	290	330	370	410	464
In Ground, in Duct A	120	145	170	205	245	280	310	350	410
In Free Air A; Spaced From Wall	148	177	210	259	312	356	400	460	529
In Free Air A; Clipped To Wall	138	166	197	242	291	332	373	427	490
Perferred Duct Nominal Size	80	80	100	100	100	100	100	125	125

Note: For rating factors see technical information section.



3 CORE COPPER WIRE SCREENED ARMoured TO AS/NZS 1972

12.7/22kV XLPE insulated, screened, GSW armoured, PVC sheathed cable. Suitable as primary supply for mines and industrial networks.

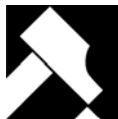
Cable Characteristics



+90°C
-25°C



12D



4



Very Good



Splashes



Very Good



C2



Rigid

Cable Design

CORE:

Metal: Plain circular compacted copper
Maximum Continuous Operating Temperature: 90°C

CONDUCTOR SCREEN:

Extruded semi-conducting compound, bonded to the insulation and applied in the same operation as the insulation

INSULATION:

Cross Linked Polyethylene (XLPE) - standard

INSULATION SCREEN:

Extruded semi-conducting compound

METALLIC SCREEN:

Plain annealed copper wire. Combined screen area is designed to provide not less than 50% conductance of one associated power conductor

ARMOUR:

Galvanised steel wires

OUTER SHEATH:

Red 5V-90 polyvinyl chloride (PVC)

Installation Conditions



IN FREE AIR



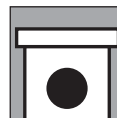
IN DUCT



IN GROUND



18D



IN TRENCH

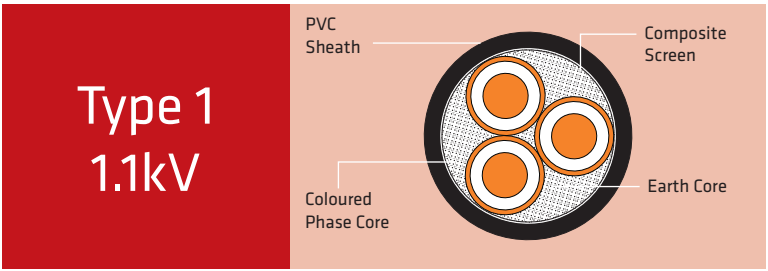
Note: The cables in this brochure are not specifically designed for use as self supporting cables, as submarine cables or where exposure to excessive heat and/or corrosive products is involved. In case of any doubt concerning the suitability of a particular cable type for a particular application, guidance should be sought from the Prysmian Customer Service Team.

12.7/22kV Copper

Characteristics

Product Code	35XFED3C22	50XFED3C22	70XFED3C22	95XFED3C22	120XFED3C22	150XFED3C22	185XFED3C22	240XFED3C22
Nominal Conductor Area mm ²	35	50	70	95	120	150	185	240
Nominal Conductor Diameter mm	7.0	8.2	9.8	11.5	12.9	14.3	16.0	18.2
Nominal Diameter Under Armour	52.43	55.07	58.82	62.48	65.70	68.92	75.49	80.41
Nominal Wire Armour Diameter mm	2.5	2.5	2.5	2.5	3.15	3.15	3.15	3.15
Nominal Diameter mm	63.6	66.5	70.4	74.5	79.4	83.0	89.8	95.1
Nominal Mass kg/100m	603	660	776	902	1110	1245	1449	1699
Pulling Tension: Cond(s) kN	7.4	10.5	14.7	20.0	25.0	25.0	25.0	25.0
Pulling Tension: Stocking kN	7.4	10.5	14.7	19.4	22.1	24.1	25.0	25.0
Pulling Tension: Armour Wires kN	16.3	18.31	20.0	22.5	25.0	25.0	25.0	25.0
Min Bending Radius During Install mm	1145	1195	1265	1340	1430	1490	1615	1710
Min Bending Radius Set In Position mm	760	795	845	890	950	995	1075	1140
Rdc @ Ref Temp: Phase Cond Ohm/km	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754
Rac @ Oper Temp: Phase Conductor	0.668	0.494	0.342	0.247	0.196	0.159	0.128	0.098
Inductance mH/km	0.438	0.418	0.385	0.367	0.351	0.340	0.336	0.323
Inductance Reactance Ohm/km	0.137	0.131	0.121	0.115	0.110	0.107	0.106	0.102
Zo @ Ref Temp: Ro Ohm/km	2.87+j0.092	2.57+j0.085	1.76+j0.075	1.28+j0.069	1.02+j0.065	0.82+j0.061	0.66+j0.059	0.53+j0.055
Capacitance: Phase To Earth uF/km	0.164	0.179	0.200	0.223	0.241	0.259	0.282	0.311
Capacitance: Charging Curr. Per Phase A/km	0.65	0.71	0.80	0.89	0.96	1.03	1.12	1.24
ISC: Phase Cond. kA, 1 sec	5.0	7.2	10.0	13.6	17.2	21.5	26.5	34
In Ground, Direct Buried A	174	204	247	293	330	365	410	465
In Ground, In Duct A	145	170	210	252	285	314	353	403
In Free Air A; Spaced From Wall	182	216	265	319	364	407	465	535
In Free Air A; Clipped To Wall	171	202	248	298	339	380	433	497
Perferred Duct Nominal Size	100	100	100	125	125	125	150	150

Note: For rating factors see technical information section.



PVC INSULATED AND COVERED, SCREENED CABLE

Cable designed for the wiring of mobile equipment such as continuous miners, shuttle cars, road headers, personnel transports, etc. Type 1 cables require further mechanical protection when used in external (non-protected) installations. They are used for the interconnection of equipment, for example control boxes, motors, etc. Cables rated in excess of 20 amps are electrically symmetrical.

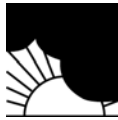
Cable Characteristics



+90°C
-0°C



1



Very Good



Splashes



Very Good



C3



Flexible

Cable Design

CORE:

Metal: Tinned Annealed Copper
Maximum Continuous Operating Temperature: 90°C

INSULATION:

Heat resistant V-90 PVC

SCREEN:

Tinned copper wire and polyester yarn composite braid screened
Cables can be individually or collectively (as displayed) screened

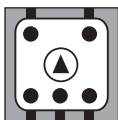
COVER:

Heat resistant 5V-90 PVC

Installation Conditions



IN DUCT



MACHINES

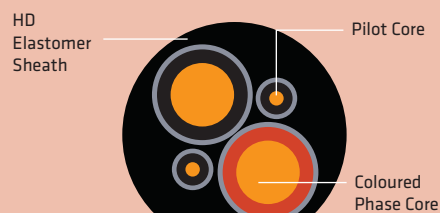
Cables require further mechanical protection.

Type 1 1.1kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Screen	Cable		
	Nominal Area	No. of cores	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Max 20°C dc Resistance, Combined	Covering Thickness	Nominal Diameter	Approx Mass
	mm ²		mm	mm	Ω/km	Ω/km	mV/A.m	Ω/km	mm	mm	kg/100m
1.1/1.1kV Type 1 Individually Screened Machine Cables											
1.5T1-IS-2C	1.5	2	1.6	0.8	17.5	0.120	30.3	13.7	0.8	10.2	15
1.5T1-IS-3C	1.5	3	1.6	0.8	17.5	0.120	30.3	13.7	0.8	10.8	20
10T1-IS-3C	10	3	4.6	1.0	2.58	0.0923	4.47	6.06	1.0	18.1	60
16T1-IS-3C	16	3	6.2	1.0	1.58	0.0854	2.74	3.72	1.3	22.0	85
1.5T1-IS-4C	1.5	4	1.6	0.8	17.5	0.128	30.3	13.7	0.8	11.9	25
10T1-IS-4C	10	4	4.6	1.0	2.58	0.0998	4.47	6.06	1.3	20.5	75
16T1-IS-4C	16	4	6.2	1.0	1.58	0.0929	2.74	3.72	1.3	24.3	110
1.1/1.1kV Type 1 Collectively Screened Machine Cables											
1.5T1-CS-2C	1.5	2	1.6	0.8	17.5	0.106	30.3	13.7	0.8	9.38	15
1.5T1-CS-3C	1.5	3	1.6	0.8	17.5	0.106	30.3	13.7	0.8	9.88	15
1.5T1-CS-4C	1.5	4	1.6	0.8	17.5	0.114	30.3	13.7	0.8	10.7	20
1.5T1-CS-6C	1.5	6	1.6	0.8	17.5	0.123	30.3	13.7	1.0	12.8	25
1.5T1-CS-16C	1.5	16	1.6	0.8	17.5	0.152	30.3	13.7	1.3	18.8	55
1.5T1-CS-30C	1.5	30	1.6	0.8	17.5	0.169	30.3	13.7	1.5	24.7	90

Type 2S, Type 2S.3



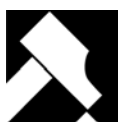
ELASTOMER INSULATED AND SHEATHED, SCREENED CABLE

Cables designed for wiring mobile equipment such as continuous miners, shuttle cars, road headers, and personnel transporters. 0.6/1kV Type 2S cables are sheathed and do not require further mechanical protection when used in external (non-protected) installations. They are used for the interconnection of equipment, for example control boxes, motors, etc., and may be used for longwall lighting systems.

Cable Characteristics



+90°C
-25°C



3



Very Good



Immersion



Very Good



C1



Flexible

Cable Design

CORE:

Metal: Tinned Annealed Copper
Maximum Continuous Operating Temperature: 90°C

INSULATION:

EPR (R-EP-90)

PILOT (WHERE REQUIRED):

Tinned annealed copper, R-EP-90 insulated (screened when individual power cores are screened)

SCREEN:

Tinned copper wire and polyester yarn composite braid screened
 Cables can be individually (as displayed) or collectively screened

SHEATH:

HD-90-CPE Black

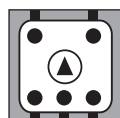
Installation Conditions



IN FREE AIR



MOBILE
EQUIPMENT

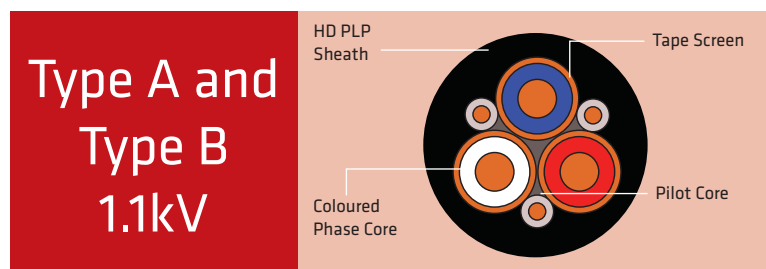


MACHINES

Type 2S, Type 2S.3

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Pilot		Screen	Cable		
	Nominal Area	No. of Cores	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Nominal Area	No. of Cores	Max 20°C dc Resistance, Combined	Sheath Thickness	Nominal Diameter	Approx Mass
	mm ²		mm	mm	Ω/km	Ω/km	mV/A.m	mm ²		Ω/km	mm	mm	kg/100m
1.1/1.1kV Type 2S Individually Screened Machine Cables													
10T2S-IS-2C	10	2	4.6	1.0	2.58	0.0953	4.47	-	-	6.06	1.8	18.9	60
16T2S-IS-2C	16	2	6.2	1.0	1.58	0.0879	2.74	-	-	3.72	1.8	22.1	85
10T2S-IS-3C	10	3	4.6	1.0	2.58	0.0953	4.47	-	-	6.06	1.8	20.1	75
16T2S-IS-3C	16	3	6.2	1.0	1.58	0.0879	2.74	-	-	3.72	1.8	23.5	105
10T2S-IS-4C	10	4	4.6	1.0	2.58	0.103	4.47	-	-	6.06	1.8	22.1	95
16T2S-IS-4C	16	4	6.2	1.0	1.58	0.0954	2.74	-	-	3.72	1.8	25.9	130
16T2S-IS-2C1P	16	2	6.2	1.0	1.58	0.0786	2.74	1	1	3.72	1.8	22.1	100
6T2S-IS-2C2P	6	2	3.5	1.0	4.32	0.0936	7.48	1	2	8.21	1.8	16.9	50
10T2S-IS-2C2P	10	2	4.6	1.0	2.58	0.0860	4.47	1	2	6.06	1.8	19.0	65
16T2S-IS-2C2P	16	2	6.2	1.0	1.58	0.0786	2.74	1	2	3.72	1.8	22.1	90
6T2S-IS-3C3P	6	3	3.5	1.0	4.32	0.119	7.49	1	3	8.21	1.8	19.8	70
10T2S-IS-3C3P	10	3	4.6	1.0	2.58	0.104	4.47	1	3	6.06	1.8	21.3	85
16T2S-IS-3C3P	16	3	6.2	1.0	1.58	0.0879	2.74	1	3	3.72	1.8	23.5	110
25T2S-IS-3C3P	25	3	7.2	1.2	0.951	0.0870	1.65	1	3	2.24	1.8	26.8	155
35T2S-IS-3C3P	35	3	8.4	1.2	0.698	0.0837	1.22	1	3	1.64	1.8	29.5	190
50T2S-IS-3C3P	50	3	9.7	1.4	0.523	0.0828	0.917	1	3	1.23	1.9	33.4	245
3.3/3.3kV Type 2S.3 Individually Screened Machine Cables													
10T2S.3-IS-3C3P	10	3	4.6	3.0	2.58	0.125	4.47	1.5	3	6.06	1.8	30.5	140
16T2S.3-IS-3C3P	16	3	6.2	3.0	1.58	0.116	2.74	1.5	3	3.72	1.9	34.7	185
25T2S.3-IS-3C3P	25	3	7.2	3.0	0.951	0.110	1.66	1.5	3	2.24	2.0	37.3	235
35T2S.3-IS-3C3P	35	3	8.4	3.0	0.698	0.105	1.22	1.5	3	1.64	2.0	39.8	275
50T2S.3-IS-3C3P	50	3	9.7	3.0	0.523	0.101	0.923	1.5	3	1.23	2.1	42.8	325
70T2S.3-IS-3C3P	70	3	12.0	3.0	0.346	0.0950	0.621	1.5	3	0.813	2.3	48.3	435
95T2S.3-IS-3C3P	95	3	13.3	3.0	0.271	0.0926	0.496	1.5	3	0.636	2.4	51.4	515
120T2S.3-IS-3C3P	120	3	15.3	3.0	0.210	0.0897	0.396	1.5	3	0.492	2.5	56.4	640
1.1/1.1kV Type 2S Collectively Screened Machine Cables													
1.5T2S-CS-2C	1.5	2	1.6	1.0	17.5	0.118	30.3	-	-	13.7	1.8	12.2	20
1.5T2S-CS-3C	1.5	3	1.6	1.0	17.5	0.119	30.3	-	-	13.7	1.8	12.7	25
1.5T2S-CS-4C	1.5	4	1.6	1.0	17.5	0.126	30.3	-	-	13.7	1.8	13.7	25
1.5T2S-CS-6C	1.5	6	1.6	1.0	17.5	0.135	30.3	-	-	13.7	1.8	16.0	35
1.5T2S-CS-16C	1.5	16	1.6	1.0	17.5	0.164	30.3	-	-	13.7	1.8	22.8	75
1.5T2S-CS-30C	1.5	30	1.6	1.0	17.5	0.181	30.3	-	-	13.7	1.8	29.1	120



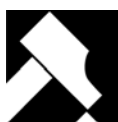
1.1/1.1KV FEEDER CABLES TO AS/NZS 1972

Individually screened power cores. 1.1/1.1kV Cable suitable for applications where the conductivity of the combined screens must meet the requirements of AS/NZS 1972. Type A cables have three pilot cores. Type B cables have no pilots.

Cable Characteristics



+90°C
-25°C



3



Excellent



Immersion



Very Good



C1



Semi
Flexible

Cable Design

CORE:

Metal:	Tinned Copper, 3 core (plus 3 symmetrical pilots in Type A)
Maximum Continuous Operating Temperature:	90°C
Conductor Tape:	Polyester textile

INSULATION:

EPR (R-EP-90) Core Colours Red, White, Blue, under a semiconductive tape

EARTH:

Screen (earth) of tinned annealed copper wire

PILOT:

Three semiconductive elastomer covered in the cable interstices (Type A only)

SHEATH:

Heavy duty HD-85-PCP

Installation Conditions



IN FREE AIR



IN DUCT



MOBILE
EQUIPMENT

For use between transportable substations and associated equipment, where the cable has to be frequently moved.

Type A and Type B 1.1kV

Physical & Electrical Characteristics

Voltage Rating & Part Number	Power Conductor							Pilot		Screen	Cable		
	Nominal Area	No. of Cores	Nominal Diameter	Insulation Thickness	ac Resistance @ 90°C & 50Hz	Reactance @ 50Hz	3 Phase Voltage Drop @ 90°C & 50Hz	Nominal Area	No. of Cores	Max 20°C dc Resistance, Combined	Sheath Thickness	Nominal Diameter	Approx Mass
	mm ²		mm	mm	Ω/km	Ω/km	mV/A.m	mm ²		Ω/km	mm	mm	kg/100m
1.1/1.1kV Type A Feeder Cables													
16TYPEA	16	3	5.1	1.4	1.48	0.109	2.57	0.75	3	6.96	2.5	27.4	150
25TYPEA	25	3	6.7	1.4	0.936	0.0991	1.63	1	3	4.40	2.5	30.9	195
35TYPEA	35	3	7.7	1.5	0.675	0.0954	1.18	1.5	3	3.17	2.5	33.4	240
50TYPEA	50	3	9.0	1.7	0.499	0.0925	0.879	2.5	3	2.35	3.0	38.1	315
70TYPEA	70	3	10.6	1.8	0.345	0.0894	0.617	2.5	3	1.62	3.3	42.3	395
95TYPEA	95	3	12.6	2.0	0.250	0.0871	0.459	2.5	3	1.76	3.8	48.7	530
120TYPEA	120	3	14.2	2.2	0.198	0.0859	0.374	2.5	3	1.39	3.8	53.0	645
150TYPEA	150	3	15.7	2.3	0.162	0.0847	0.317	2.5	3	1.13	4.4	57.8	765
185TYPEA	185	3	17.9	2.5	0.130	0.0832	0.267	2.5	3	0.900	5.1	65.2	975
240TYPEA	240	3	20.3	2.7	0.0997	0.0841	0.226	2.5	3	0.686	5.7	74.5	1300
1.1/1.1kV Type B Feeder Cables													
16TYPEB	16	3	5.1	1.4	1.48	0.106	2.57	-	-	6.96	2.5	27.1	145
25TYPEB	25	3	6.7	1.4	0.936	0.0982	1.63	-	-	4.40	2.5	30.8	190
35TYPEB	35	3	7.7	1.5	0.675	0.0954	1.18	-	-	3.17	2.5	33.4	235
50TYPEB	50	3	9.0	1.7	0.499	0.0925	0.879	-	-	2.35	3.0	38.1	305
70TYPEB	70	3	10.6	1.8	0.345	0.0894	0.617	-	-	1.62	3.3	42.3	390
95TYPEB	95	3	12.6	2.0	0.250	0.0871	0.459	-	-	1.76	3.8	48.7	525
120TYPEB	120	3	14.2	2.2	0.198	0.0859	0.374	-	-	1.39	3.8	53.0	640
150TYPEB	150	3	15.7	2.3	0.162	0.0847	0.317	-	-	1.13	4.4	57.8	760
185TYPEB	185	3	17.9	2.5	0.130	0.0832	0.267	-	-	0.900	5.1	65.2	970
240TYPEB	240	3	20.3	2.7	0.0997	0.0841	0.226	-	-	0.686	5.7	74.5	1295

Technical Information - Mechanical

BENDING RADII

Observation of cables during service has shown problems arise from cables being reeled or passed around pulleys or sheaves of too small a bending diameter. This also occurs when moving trailing cables. If the minimum bending diameter is observed, then the effect of reeling on the lay or twist of phase conductors will be minimised. Additionally if the recommendations are followed;

- braid screens will be prevented from stretching too far and breaking up
- semi conducting tapes will not become unlapped and
- the incidence of bird-caging or kinking of conductors will be reduced by distributing mechanical stresses uniformly

Recommended minimum bending radii in multiples of cable overall diameter

	Maximum Bending Radius	
	Cables Rated 1.1/1.1kV	Cables Rated 3.3kV and above
	Unarmoured	Unarmoured
For despatch drum barrel	6	8
For fixed bend	4	6
Free flexing applications	6	10
Permanent repeated reeling	10	12
Passing over sheaves	10	15
Festoon	7	10
Cable chain	5	10

CABLE TENSION

When cables experience tension, initially they become more compacted, as individual wires, strands and cores are pulled closer together. As tension increases, the cable will stretch, which may result in it no longer having a balanced construction. As the cable stretches, individual wires in the strand are forced into compression and shear, and now the small wires are damaged and will break more easily during bending or flexing. The stretching of the conductors may result in permanent elongation, causing the conductors to become wirey.

Tension also elongates the conductor insulation, resulting in a reduced radial thickness. The elongated insulation is then vulnerable to compression cutting (it will rupture more easily when it is crushed against the stranded conductor during runovers or when passed around bends).

All possible steps should be taken to ensure that recommended cable tensions are not exceeded. The maximum safe working force for metric flexible conductors is 20 N/mm² when trailing. T, the maximum pulling tension (Newtons) is calculated by multiplying the number of cores and area of each core, by the safe working force. Note, when calculating the safe tensile force, area of earths, pilots, and shields must not be included. When dragging cable, the maximum length of cable that should be dragged from a suitably

formed centre point, may be calculated by the following formula:

$$L = \frac{T}{f \times W \times 10}$$

L = Maximum total length of cable to be pulled (m)

f = 0.5 (coefficient of friction)

W = Mass of Cable (kg/m)

Suspended unarmoured cables should not exceed the maximum pulling tension as calculated by:

$$L = \frac{T}{W \times 9.8}$$

L = Maximum total length of cable to be suspended (m)

For high tensile loads, bending radii should be increased, to limit damage to the cable. If the cable is required to endure higher tensile loads than above, support elements should be included in the cable structure. These can be either textile or metal, depending on the required duty of the cable.

Trailing and reeling cables can also experience torsional loads. While all efforts should be made to remove this condition, cables can be manufactured to withstand a degree of abuse, during their service life. Prysmian incorporate textile braid reinforcement into many cables. In this instance, torsional stresses should be limited to $\pm 25^\circ/\text{m}$.

SAFE WORKING FORCE

Total tension on the 3 power cores		
Nominal Conductor Area	Straight tension without significant bending or flexing. Safety Factor 4 to 1	Subjected to repeated reeling or bending whilst under tension. Safety Factor 8 to 1
mm ²	kN	kN
0.5	0.045	0.0225
0.75	0.0675	0.03375
1.0	0.09	0.045
1.5	0.135	0.0675
1.5	0.225	0.1125
4	0.36	0.18
6	0.54	0.27
10	0.90	0.45
16	1.44	0.72
25	2.25	1.125
35	1.15	1.575
50	4.5	2.25
70	6.3	3.15
95	8.55	4.275
120	10.8	5.4
150	13.5	6.75
185	16.65	8.3
240	21.6	10.8
300	27	13.5

Technical Information - Electrical

CONTINUOUS CURRENT CARRYING CAPACITY

In accordance with IEC60287 for the free air condition based on a conductor temperature of 90°C, and ambient air temperature 40°C, a solar radiation absorption coefficient of 0.8 and an intensity of 1000W/m², where exposed to direct sunlight, the following current carrying capacities should be adopted.

Power Conductor Nominal Area	Protected From Sun Cable Voltage Rating		Exposed To Sun Cable Voltage Rating	
mm ²	1.1/1.1kV	3.3/3.3 - 33/33kV	1.1/1.1kV	3.3/3.3 - 33/33kV
1.5	23	-	18	-
2.5	30	-	23	-
6	49	-	38	-
10	66	-	51	-
16	88	89	67	66
25	120	120	90	89
35	145	145	110	105
50	170	170	125	125
70	220	220	160	155
95	250	250	185	180
120	295	295	210	220
150	340	340	245	240
185	385	385	270	265
240	455	450	315	310
300	515	510	355	350

DERATING FACTORS FOR MULTIPLE COILS

Where layers of flexible cable are stored on cylindrical type drums or reels, allowances must be made to cater for reduced heat dispersion. Current carrying capacities must be multiplied by the following derating factors;

No. Of Layers On Drum	Derating Factor
Cylindrical Drum	
1	0.85
2	0.65
3	0.45
4	0.35
Radial Drum	
Ventilated	0.85
Unventilated	0.75

Where cables are exposed to higher temperatures in trailing applications, or possible lower temperatures in underground applications, the following rating factors should / can be applied for current carrying capacity.

Conductor Temp	Rating Factor Ambient Air Temperature °C									
	15	20	25	30	35	40	45	50	55	60
75	1.35	1.28	1.21	1.14	1.07	1.0	0.91	0.82	0.72	0.60
90	1.26	1.20	1.15	1.10	1.05	1.0	0.94	0.88	0.81	0.73

Technical Information - Ratings Information

RATING FACTORS FOR XLPE FEEDER CABLES

Cables buried direct in the ground:

Variation in ground temperature								
Ground Temperature °C	10	15	20	25	30	35	40	
Rating Factor	11.11	1.07	1.03	1	0.97	0.93	0.89	
Variation in thermal resistivity of soil		Values of 'g' °C m/W						
Nominal Area Of Conductor mm²	0.8	0.9	1	1.2	1.5	2	2.5	3
Three Core Cables								
Up to 16	1.09	1.06	1.04	1	0.95	0.87	0.79	0.74
From 25 - 150	1.14	1.1	1.07	1	0.93	0.84	0.76	0.7
From 185 - 400	1.16	1.11	1.07	1	0.92	0.82	0.74	0.68
Group rating factors for three core cables, in horizontal formation				Group Spacing - Meters				
Voltage Range Of Cables	No. Of Cables In Group	Touching	0.15	0.3	0.45	0.6		
From 1.9/3.3kV to 12.7/22kV	2	0.8	0.85	0.89	0.9	0.92		
	3	0.69	0.75	0.8	0.84	0.86		
	4	0.63	0.7	0.77	0.8	0.84		

DUCT SELECTION

Cables buried in Singleway ducts:

Nominal Duct Size				Max Cable Diameter				
50				29				
63				38				
80				55				
100				72				
125				88				
150				100				
200				143				
Variation in ground temperature								
Ground Temperature °C	10	15	20	25	30	35	40	
Rating Factor	1.11	1.07	1.03	1	0.97	0.93	0.89	
Variation in thermal resistivity of soil		Values of 'g' °C m/W						
Nominal Area Of Conductor mm²	0.8	0.9	1	1.2	1.5	2	2.5	3
Three Core Cables								
Up to 16	1.05	1.04	1.03	1	0.97	0.92	0.87	0.83
From 25 - 150	1.07	1.05	1.03	1	0.96	0.9	0.85	0.78
From 185 - 400	1.09	1.06	1.04	1	0.95	0.87	0.82	0.76
Group rating factors for three core cables in singleway ducts				Group spacing - meters				
Voltage Range Of Cables	No. Of Cables In Group	Touching		0.3		0.45		0.6
From 1.9/3.3kV to 12.7/22kV	2	0.88		0.91		0.93		0.9
	3	0.8		0.84		0.87		0.84
	4	0.75		0.81		0.84		0.8

Cables installed in free air:

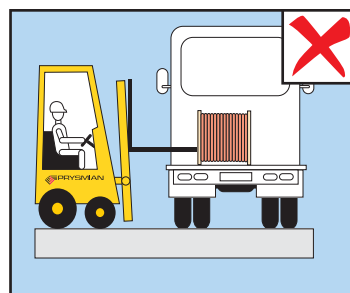
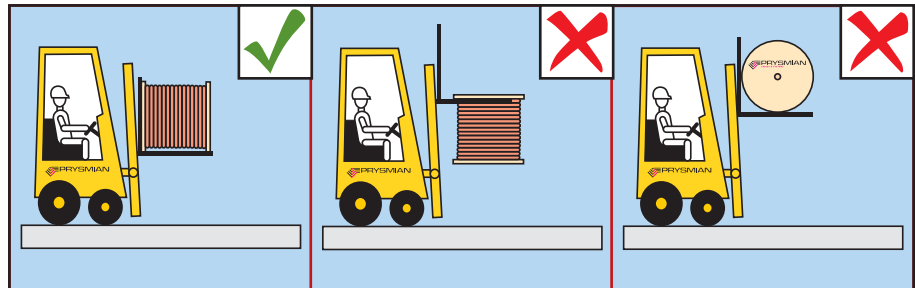
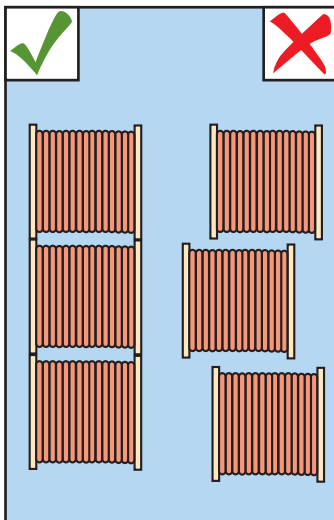
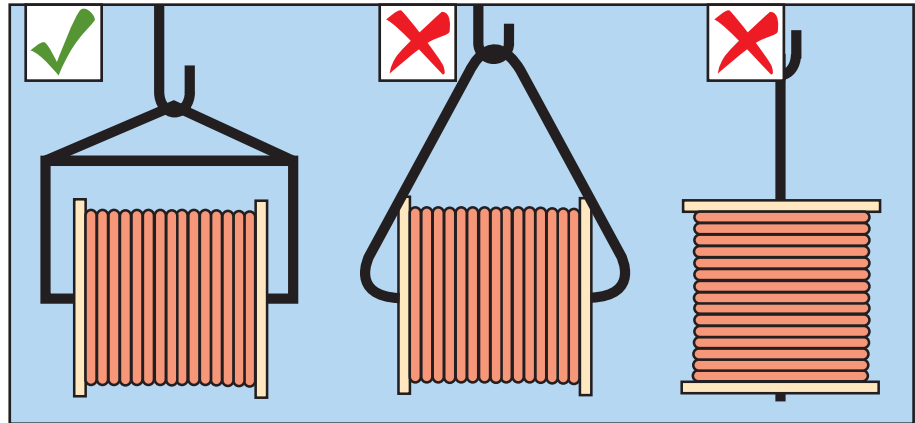
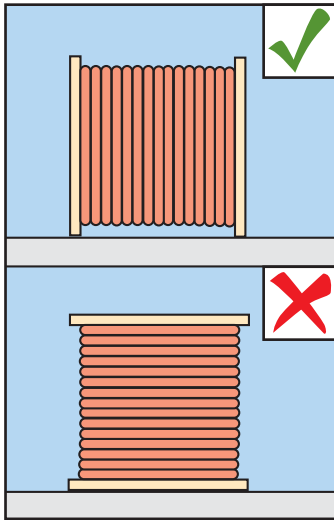
Variation in ambient air temperature								
Ambient Air Temperature °C	15	20	25	30	35	40	45	50
Rating Factor	1.26	1.2	1.15	1.1	1.05	1	0.94	0.88

Grouping of cables in air:

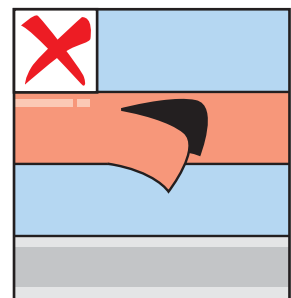
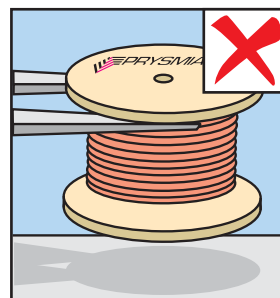
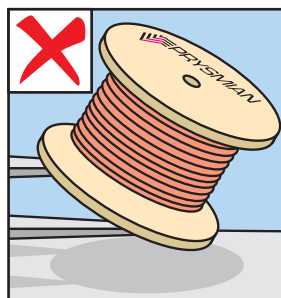
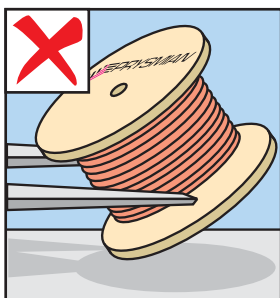
Derating is not necessary if the following minimum clearance between adjacent circuits can be maintained

- 1 The horizontal clearance is not less than twice the diameter of an individual cable.
- 2 The vertical clearance is not less than four times the diameter of an individual cable.
- 3 Where the number of circuits is more than three, they are installed in a horizontal plane.

Drums Handling Procedure



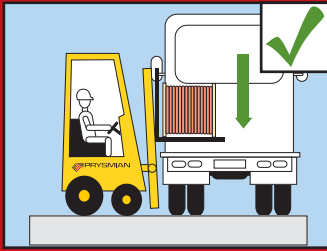
Do not use the fork lift tynes to push cable drums sideways on a truck tray or the ground as damage to the flanges can result in the drum being unacceptable to customers.



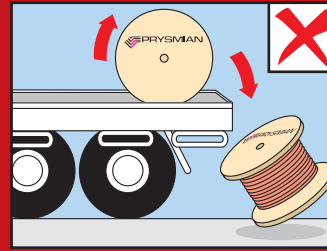
Do not attempt to lift drums of cable without inserting the fork lift tynes fully under both flanges as the tynes can damage the cable, making it unserviceable. Do not attempt to lift drums by the flange or to lift drums into the upright (correct) position by lifting the top flanges as it may break the flange from the drum barrel. The drum will then be undeliverable. Use a length of steel pipe through the centre of the drum to provide leverage and control.

This cable has been rendered unserviceable through fork lift tyne damage and may necessitate the scrapping of the whole drum.

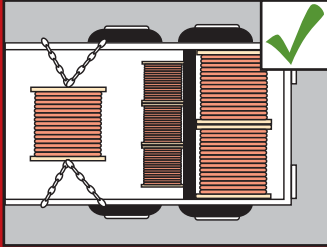
When rewinding cables, drums shall be of suitable construction and in good condition. All drums shall be held firmly in appropriate pay-off stands to prevent vibration and ensure smooth, even rotation to minimise inner end cable grow-out and tangling. Cables shall be wound evenly and uniformly, then secured.



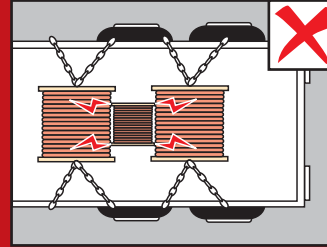
Lower drums gently onto the ground or transport.



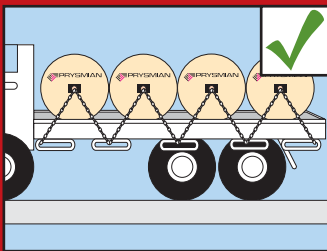
Avoid impact force loadings. Never drop drums.



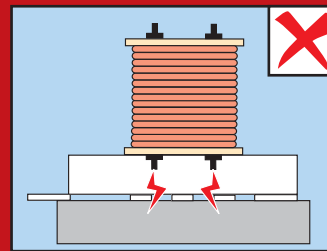
Always protect cable from rubbing or damage. Adjust load or use separators.



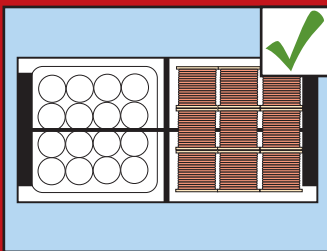
Never let drum flanges contact cable on adjacent drums.



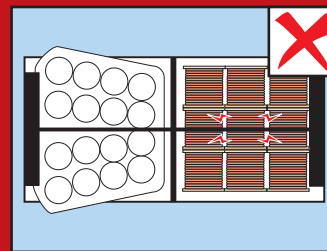
Heavy drums should be chained appropriately for transit, with protection from the chain rubbers for the spindle hole in the centre of the drum. Under no circumstances are drums to be transported on their side.



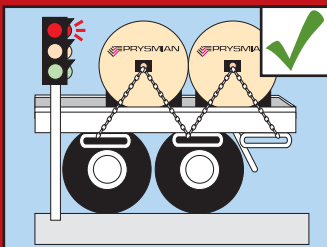
Never lay drums on their side, even on top of pallets, as protruding bolts damage spools and cable.



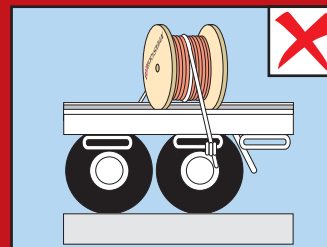
Always protect product, especially spools, against rope damage during tying down of load.



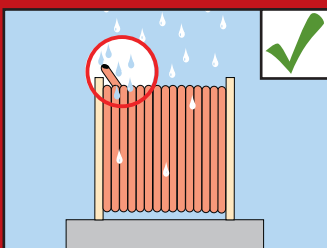
Never use rope directly over shrinkwrapped cable.



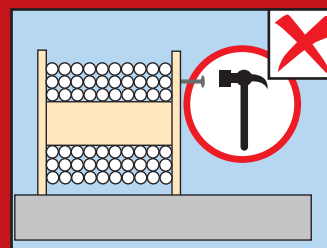
Ensure drums are restrained to restrict movement during sudden stop/starts.



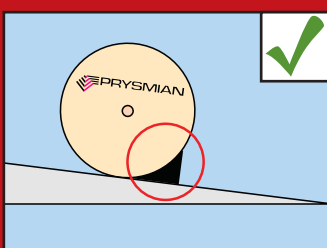
When securing drums for transit, do not place ropes or chains over cable as damage can occur to the outer insulation rendering the cable unserviceable.



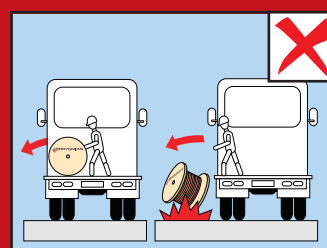
Ensure cable sealing is intact so moisture cannot seep into cable. Report damage.



Avoid use of additional nails on drums or cable. Flange thicknesses vary and some customers prohibit their use.



When placing drums on an uneven surface be prepared to check drums against rolling and chock if required.

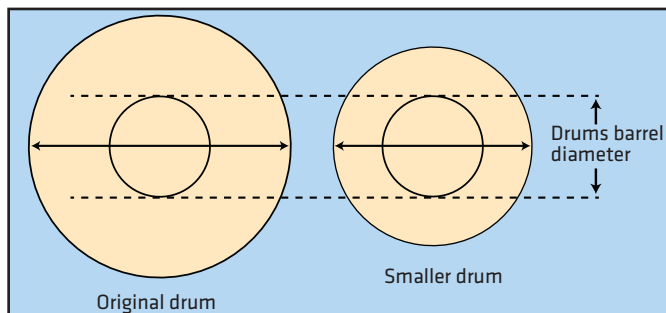
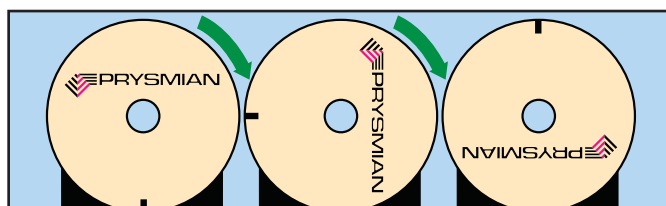
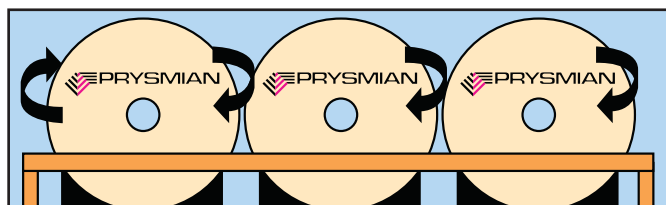
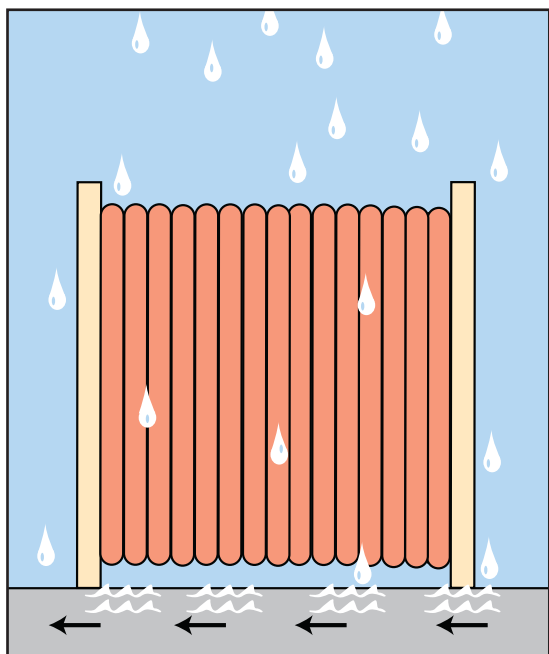


Do not roll cable drums from the back of a delivery truck to the ground as the resulting flange damage will be unacceptable to the customer as the cable will not be able to be rolled off the drum and the drum will need to be returned.

Storage Recommendations

When storing cable drums for long periods, please take the following guidelines into consideration:

- ✓ Select a site for storage that is level and dry, preferably indoors with a concrete surface, with no risk of falling objects, chemical spills (oil, grease, etc.) open flames and excessive heat.
- ✓ If indoors, and concrete storage is not available, select a well-drained surface that will prevent the reel flanges sinking into it.
- ✓ The drums must always be stored with their flanges vertical.
- ✓ Leave enough space between stored drums for air circulation.
- ✓ If drums are stored in a high traffic area (fork lifts frequent transit) suitable barriers should be erected to prevent damage from moving equipment.
- ✓ The bolts should be tightened at regular intervals.
- ✓ During storage, the drums should be rolled to an angle of 90° every three months.
- ✓ When only a portion of the cable is used, the open end of the cable remaining on the drum should immediately be re-sealed to prevent the entrance of moisture. Once it has been re-sealed, the cut end should be fixed to the inside edge of the drum flange to prevent the end from extending beyond the flanges during drum movement.
- ✓ When it is required to rewind the cable on to another drum, always consider that the diameter of the new drum barrel should be at least the same size of the original drum barrel diameter.



Notes

Notes

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