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TRATOS

CABLES FOR A MOVING WORLD

TRATOS ASNZS MTO®

for Mining and Tunnelling Applications

AS/NZS 1802:2003
AS/NZS 2802:2000
AS/NZS 1972:2006

February **2025**
TCn10-Rev-20

INDEX

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

CABLES BASED ON AS/NZS 1972:2006

REELING & TRAILING CABLES BASED ON (N) TSCGEWÖU VDE 0250

INTRODUCTION

Cables manufactured in accordance with:

1. The duration of acceptable life of a particular type of cable depends upon the type of use, installation or electrical apparatus and on the particular combination of influences relating to its use. Tratos recognise that the conditions under which electric cables have to operate in the Australia mining industry are extremely severe, the premature failure of an electric cable can be both expensive and hazardous. It is therefore essential that a high level of safety be achieved. Tratos understand that it is necessary to provide cables for use in the Australian mining environment that minimise the hazard to people and damaged to equipment or the electrical system.

2. Tratos manufactures an extensive range of cables for power, control and associated circuits in mines worldwide which in spite of the rough usage will limit the risk to people and improve the safety in mines in general.

   The objects of Tratos are to design and manufacture mining cables that are safe and reliable when properly used.

   Tratos manufacturing facilities have also been awarded Internationally recognised approvals to Environmental Standard ISO 14001 and our products are fully compliant with Reach, WEEE and RoHS.

   Tratos strive to be a Zero Harm company.

3. In order that our cables consistently maintain their outstanding levels of performance our modern sophisticated production processes are backed up by a stringent quality assurance system, which ensures that the materials, construction and overall performance of our cables are the best that modern technology can offer. These features enable our mining cables to have a long working life thus increasing the efficiency and productivity of your operation by reducing expensive downtime of machinery

4. Tratos combines over 40 years of experience with cutting edge technology, balance of reliability and innovation to manufacture cables. Which can be designed to comply with Australian, European as well as other national or private specifications for service anywhere in the world.

STANDARDS AND QUALITY SYSTEM

STANDARDS

Cables manufactured in accordance with:

AS/NZS 1802:2003 . . . . . .Electric cables –reeling and trailing– for underground coal mining
AS/NZS 2802:2000 . . . . . Electric cables –reeling and trailing– for mining and general use (other than underground coal mining)
AS/NZS 1972:2006 . . . . . Electric cables –Underground coal mines– other than reeling and trailing
AS/NZS 1125: 2001 . . . . . Conductors in insulated electric cables and flexible cord**s**
AS/NZS 3808: 2000. . . . . Insulating and sheathing materials for electric cables
AS/NZS 5000.1: 2005 . . . . . Electric cables – Polymeric insulated, Part 1: for working voltages up to and including 0.6/1 (1.2) kV

STANDARDS AND QUALITY SYSTEM

QUALITY SYSTEM

Tratos aim to work closely with customers to find better, more environmentally friendly solutions to their challenges.
We are committed to our vision and strategy to serve all our internal and external customers by providing high quality services and products. Tratos is an established industry leader in the design, manufacture and supply of cables and products and to maintain this leading position we are committed at every level to providing our customers with quality services and products at a competitive price. As a commercial enterprise we are aware of the importance of satisfying our customers and of the financial impact of which nonconformities may have on our profitability. For these reasons we are committed to complying with all customer requirements and specifications both legal and statutory requirements. Our Quality Management System has been audited and approved by two independent, Internationally recognized and accepted authorities: BSI and AENOR-IQNET (E), in accordance to BS EN ISO 9001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Autorities.

ENVIRONMENTAL SYSTEM

Our Environmental Management System has been audited and approved by two independent, Internationally recognized and accepted authorities:
BSI and AENOR-IQNET (E), in accordance to BS EN ISO 14001:2015 covering the production, purchasing of raw materials design and final test including various document types. The Tratos Quality Management system is under frequent regular surveillance by inspectors working for the Certification Autorities.

ENERGY MANAGEMENT SYSTEMS

By complying with the BS EN ISO 50001:2018 Tratos follows a systematic approach in achieving continual improvement of energy performance and the Energy Management Systems (EnMS).
The BS EN ISO 50001:2018 is a standard issued by the International Standard Organization (ISO) which outlines the requirements for establishing, implementing, maintaining and improving an energy management system (EnMS).

CIRCULAR ECONOMY

The EU Eco-Management and Audit Scheme (EMAS) is a premium management instrument developed by the European Commission for companies and other organisations to evaluate, report, and improve their environmental performance. EMAS is open to every type of organisation eager to improve its environmental performance. It spans all economic and service sectors and is applicable worldwide.

AWARDS

Tratos cables are made with award winning Tratos-JBA® compound. Tratos UK Ltd has won a **Queen's Award for Enterprise - Innovation** for its technologically advanced Tratos-JBA® compound.

STANDARDS AND QUALITY SYSTEM

HEALTY & SAFETY SYSTEM

Oince its decision to create a board post dedicated to furthering best practice for Health and Safety, international cable manufacturer Tratos is celebrating receipt of ISO 45001.
ISO 45001 sets out the minimum requirements for occupational health and safety management best practice and helps companies achieve the maximum return for employees, operations and customers.

REACH, WEEE & ROHS

Tratos is fully compliant with the **REACH**. This is a European Union regulation concerning the **Registration, Evaluation, Authorisation and restriction of Chemicals**. It came into force on 1st June 2007 and replaced a number of European Directives and Regulations with a single system. REACH applies to substances manufactured or imported into the EU in quantities of 1 tonne or more per year. Generally, it applies to all individual chemical substances on their own, in preparations or in articles . To summarise, REACH makes the cable industry directly responsible for assessing and managing the risks posed by chemicals and providing safety information to their users.

Tratos fully subscribes to The **Waste Electrical and Electronic Equipment Directive (WEEE Directive)**, introduced into UK law in January 2007 by the Waste Electronic and Electrical Equipment Regulations 2006. The WEEE Directive aims to reduce the amount of electrical and electronic equipment being produced and to encourage everyone to reuse, recycle and recover it. The WEEE Directive also aims to improve the environmental performance of businesses that manufacture, supply, use, recycle and recover electrical and electronic equipment. TRATOS has enlisted the services of the UK's leading producer compliance scheme, Valpak, whom manage our recycling obligations and also ensure our compliance to the WEEE Regulations and the Waste Batteries and Accumulators Regulations.

Tratos is fully compliant with the **Restriction of Hazardous Substances (RoHS) Regulations**. These Regulations implement EU Directive 2011/65/EU which bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. Tratos fully understands the requirements of the RoHS Directive and ensures that our products, and their components, comply.

CORPORATE SOCIAL RESPONSABILITY

Tratos adoptes a Code of Ethics which adheres to the United Nations Global Compact on human rights, labour standards, protection of the environment and anti corruption measures.
Under this self regulatory code, Tratos will carry out initiatives in the environmental and social fields with special reference to environmental policies and social policies regarding child labour, compulsory labour, health and security, freedom of association and the right to collective bargaining, discrimination, disciplinary procedures, working hours and wages.

APPROVALS

Mining & Tunnelling Cables made by Tratos have been approved by the following Quality Organisations:

TRATOS ASNZS MTO®

STANDARDS AND QUALITY SYSTEM

STANDARDS

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AS/NZS 1802:2003 . . . . . .Electric cables –reeling and trailing– for underground coal mining
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AS/NZS 3808: 2000. . . . . Insulating and sheathing materials for electric cables
AS/NZS 5000.1: 2005 . . . . . Electric cables – Polymeric insulated, Part 1: for working voltages up to and including 0.6/1 (1.2) kV

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Tratos is fully compliant with the **Restriction of Hazardous Substances (RoHS) Regulations**. These Regulations implement EU Directive 2002/95 which bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. Tratos fully understands the requirements of the RoHS Directive and ensures that our products, and their components, comply.

APPROVALS

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GOST Russian Certificate of Conformity

Verband Der Elektrotechnik

IMQ CSQ

CORPORATE SOCIAL RESPONSABILITY

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TECHNICAL INFORMATION

CABLE TYPE DEFINITION

Cable Type Definition According to AS/NZS 1802

Type	Description	Voltage Designation kV
	Cable Type Definition According to AS/NZS 1802	
209	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core	from 1,1/1,1 to 11/11
210	Composite copper braid screened three-core cable with a central extensible pilot core for hand-held boring machines. Electrically symmetrical	1,1/1,1
240	Composite copper braid screened three-core cable with three interstitial pilot cores for general use in a mine such as a feeder cable or supply to a longwall face. Electrically symmetrical	from 1,1/1,1 to 11/11
241	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core, a very popular cable for general use in a mine such as pumps and power supply to a range of equipment. Electrically symmetrical	from 1,1/1,1 to 11/11
245	Semi-conductive screened three-core cable with three interstitial earth cores and three central pilot cores designed specifically for use in longwall mining systems powering shearers. Electrically symmetrical	from 1,1/1,1 to 3,3/3,3
260	Composite copper braid screened three-core cable with three interstitial pilot cores and pliable wire armour protection giving maximum mechanical strength and protection in feeder cable applications. Electrically symmetrical	from 1,1/1,1 to 11/11
275	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core, a very popular cable for use as the power supply to shuttle cars and similar reeling applications. Electrically symmetrical	1,1/1,1

Cable Type Definition According to AS/NZS 1802

Cable Class	Type	Description	Voltage Designation kV
		Cable Type Definition According to AS/NZS 2802	
Class 1	441	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core, popular for both trailing and reeling applications such as supply cable to draglines, drills and face shovels. Electrically symmetrical	from 3,3/3,3 to 22/22
	450	Composite copper braid screened three-core cable with two interstitial earth cores and one interstitial pilot core for use as a supply cable to mobile equipment including slow reeling applications. Electrically un-symetrical	from 3,3/3,3 to 33/33
	451	Composite copper braid screened three-core cable with two interstitial earth cores and one reduced interstitial pilot core for use as a supply cable to large mobile equipment including slow reeling applications. Electrically un-symetrical	
	455	Semi-conductive screened three-core cable with two interstitial earth cores and a one interstitial pilot core smaller in diameter and lighter than a Type 451 cable. Electrical un-symetrical	from 3,3/3,3 to 11/11
Class 2	409	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core, a popular cable for use as a flexible feeder cable to mobile equipment such as draglines, drills and face shovels. Electrically symmetrical	from 1,1/1,1 to 22/22
	412	Unscreened pliable wire armoured three-core cable with three interstitial earth cores (no pilot) giving maximum mechanical strength and protection in feeder cable applications. Electrically symmetrical	1,1/1,1 only
	440	Composite copper braid screened three-core cable with three interstitial pilot cores, suitable for use with pumps or other large items of mobile equipment. Electrically symmetrical	from 1,1/1,1 to 22/22
	441	Semi-conductive screened three-core cable with three interstitial earth cores and a central extensible pilot core, popular for both trailing and reeling applications such as supply cable to small draglines, drills and face shovels. Electrically symmetrical	1,1/1,1 only

REELING & TRAILING CABLE ELECTRICAL CHARACTERISTICS

1. Power Core Conductor Characteristic

Nominal Cross Sectional Area mm²	Nominal Conductor Diameter mm	Max. DC Resistance at 20° Ω/km	Max. AC Resistance at 90°* Ω/km	Nominal 3-Phase Voltage Drop* mV/A.m	Nominal Reactance* Ω/km
1,5	1,6	14,0	17,4	30,1	0,17
2,5	2,0	8,37	10,5	18,2	0,15
6	3,5	3,39	4,33	7,5	0,14
10	4,6	2,02	2,58	4,5	0,13
16	5,7	1,24	1,57	2,7	0,12
25	7,6	0,746	0,936	1,6	0,11
35	8,8	0,547	0,675	1,2	0,10
50	10,1	0,410	0,523	0,92	0,10
70	12,1	0,271	0,346	0,62	0,097
70	12,4	0,271	0,346	0,62	0,096
95	13,3	0,212	0,270	0,50	0,095
95	14,5	0,208	0,266	0,49	0,093
120	15,4	0,164	0,209	0,40	0,092
120	16,2	0,162	0,208	0,39	0,091
150	17,2	0,129	0,166	0,33	0,091
150	18,1	0,127	0,163	0,32	0,089
185	19,3	0,106	0,137	0,28	0,089
240	23,0	0,0818	0,107	0,24	0,087
300	24,5	0,0644	0,0847	0,21	0,086

*The AC characteristics are valid for up to 1.1/1.1kV operating voltage and can be used as a guide for higher operating voltages.

Power conductors of less than 6 sqmm nominal cross-sectional area are Class 5 flexible bunched, sizes of nominal cross-sectional area 6 sqmm or larger are multiple-stranded circular flexible (rope lay).

TECHNICAL INFORMATION

REELING & TRAILING CABLE ELECTRICAL CHARACTERISTICS

1. Continuous Current Carrying Capacity

Power Conductor Nominal Area	Cable Voltage Rating			
	Protected From Sun		Exposed To Sun	
	1.1/1.1kV	3.3/3.3kV–33/33kV	1.1/1.1kV	3.3/3.3–33/33kV
mm²	A	A	A	A
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

2. Current Rating Factor

Where the cable is wound on cylindrical or radial drum, the heat dispersion factor must be taken into consideration; therefore the current carrying capacity must be reduced by the derating factor:

Cylindrical Drum	
Number of layer on drum	Factor
1	0,85
2	0,65
3	0,45
4	0,35

Radial Drum	Ventilated	Unventilated
Factor	0,85	0,75

Variations in ambient temperature for cable installed in air or in underground:

Ambient Temperature	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C	85°C
Conductor Temperature is 90°C	1,26	1,20	1,15	1,10	1,05	1,0	0,94	0,88	0,81	0,73	0,65	0,57	0,47	0,34	0,19

Continues Current Rating above is calculated based on the IEC60287 Standard and Australian typical environment:
40 °C air ambient temperature, 0.8 solar radian absorption coefficients and 1000W/m² and the value is for guidance only.

TECHNICAL INFORMATION

REELING & TRAILING CABLE MECHANICAL & THERMAL CHARACTERISTICS

1. Cable Minimum Bending Radius

Installation condition	1.1/1.1kV	3.3/3.3~33/33kV
For dispatch drum barrel	6D	8D
For fixed bend	4D	6D
For free flexing	6D	10D
For permanently repeating reeling	10D	12D
For passing over sheaves	10D	20D

For XLPE and Paper insulated HV cables, bending radii is 18D (during installation) / 12D (installed).

2. Cable Maximum Pulling Tension

For trailing the cable	20N/mm^2 of the total cross-sectional area of phase conductor
For dragging the cable	calculated by T = L*W*f*10, where T is the pulling tension, L is the length of cable to be pulled (m), W is the weight of the cable (kg/m), f is the friction coefficient (usually take as 0.5)

3. Temperature

Maximum continuous conductor temperature: +90°C
Minimum Ambient Temperature: -25°C

TECHNICAL INFORMATION

REELING & TRAILING CABLE MATERIAL CHARACTERISTICS

1. Conductor Screen

All cables with a voltage rating of 3.3/3.3 kV and above have a cross-linked semiconductive elastomeric material extruded directly over the power core conductor through a triple extrusion process. Textile-reinforced Semiconductive tape or water barrier (water-proof) tape can be applied on special request or particular purposes.

2. Insulation Screen

Semiconductive elastomer screen: The material used for insulation screen is a cross-linked semiconductive elastomeric compound which directly applied over the insulation of each power core . T h e ma x imum volume resistivity of this compound is 1 Ωm at 23 °C. Textile reinforced semiconductive tape screen: As an alternative to an elastomer screen, the textilereinforced semiconductive tape screen may be applied over the insulation of power cores of 3.3/3.3kV Type 450 & 451 (Class 1) and 3.3/3.3kV up to and including 11/11kV Type 409 & 440 (Class 2). The semiconductive tape comprises a textile fabric, coated with a semiconductive elastomer and having a continuous print on one side identifying it as being semiconductive.

3. Cradle separators / Earth Covering / Screen for Core Assembly

Semiconductive elastomer used in cradle separators, the interstitial earth conductor covering (other than for Type 412) and the screen for core assembly (Types 241, 245, 275 and 441 only) is a compound based on polychloroprene (PCP) which complies with the table below.

Test (per AS/NZS1802 / AS/NZS 2802)		Specified Value
A	Mechanical tests without ageing	-
1	Tensile strength (MPa)	≥8,5
2	Elongation at rupture (percent)	≥200
3	Permanent set (percent)	≤20
B	Mechanical tests after ageing in air oven	-
1	Tensile strength (MPa)	≥6,2
2	Elongation at rupture (percent)	≥50
C	Volume resistivity at 23°C (Ω.m)	≤1,0

REELING & TRAILING CABLE MATERIAL CHARACTERISTICS

4. Power / Pilot Core Insulation

	AS /NZS 1802 reeling and trailing cable	AS /NZS 2802 reeling and trailing cable
Power Core Insulation	R-EP-90	XR-EP-90 (for class 1 cables) R-EP-90 (for class 2 cables)
Pilot Core Insulation	R-EP-90	XR-EP-90/R-EP-90

R-EP-90: a flexible cross-linked compound based on ethylene propylene copolymer, terpolymer or a blend of the two, suitable for up to 90 °C maximum continuous operating temperature. Class 2 cables have a greater insulation radial thickness which provides a more robust cable.

XR-EP-90: a pliable cross-linked compound based on ethylene propylene copolymer (EPM), or ethylene propylene terpolymer (EPDM or EPT),having enhanced properties compares with R-EP-90, suitable for up to 90°C maximum continuous operating temperature.
Class 1 cables are insulated with a high grade ethylene propylene rubber (XR-EP-90)which permits a reduced radial thickness for the insulation compared with equivalent rated

Test (per AS/NZS 1802/AS/NZS 2802)		R-EP-90		XR-EP-90
A	Mechanical tests without ageing	-		-
1	Tensile strength (MPa)	≥4,2		≥8,5
2	Elongation at rupture (percent)	≥200		≥200
B	Mechanical tests after ageing in air oven	-		-
1	Tensile strength (percentage of values found in unaged specimens)	≥70		≥75
2	Elongation at rupture (percentage of values found in unaged specimens)	≥70		≥75
C	Hot set test	-		-
1	Elongation under load (percent)	≤175		≤175
2	Residual elongation after cooling (percent)	≤15		≤15
D	Electrical characteristics	≤1,1/1,1kV	≥3,3/3,3kV	-
1	Insulation resistance constant (ki) at room temperature (GΩ.m)	≥1500	≥4000	≥4000
2	Insulation resistance constant (ki) at 90 °C (GΩ.m)	≥1,5	≥4,0	≥4,0

5. Metallic Composite Screen

Composite screen for Type 409 and 440 consists of tinned annealed copper strands interwoven with polyester yarn each strand consists of seven copper wires with nominal diameter between 0.25 and 0.50 mm. Composite screens for Type 450 and 451 consists of a flat ribbon of tinned annealed copper wires laid flat and parallel interwoven with polyester yarn, each group of wires having a nominal diameter between 0.25 and 0.50 mm.

6. Pliable Steel Strand Armour

Pliable amour comprises galvanized low carbon (mild) steel strands, each strand consist of seven wires applied helically over the inner sheath to provide close cover and enhanced mechanical protection. The wires comply with the requirements of AS/NZS 3863.

TECHNICAL INFORMATION

REELING & TRAILING CABLE MATERIAL CHARACTERISTICS

7. Sheath

Inner sheath (Type 206 and 412 only): GP-85-PCP (Standard), GP-90-CSP or GP-90-CPE to AS/NZS 3803.
Outer sheath:

AS1802 reeling and trailing cable	HD-85-CSP,HD-90-PCP or HD-90-CPE to AS/NZS 3808
AS2802 reeling and trailing cable	HD-85-CSP,HD-90-PCP or HD-90-CPE to AS/NZS 3808 (for class 2 cable); XHD-85-CSP,XHD-90-PCP or XHD-90-CPE to AS/NZS 3808 (for class 1 cable)

GP-85-PCP: General purpose cross-linked compound based on Polychloroprene, suitable for up to 85°C maximum continuous operating temperature.

GP-90-CSP: General purpose cross-linked compound based on chlorinated polyethylene, suitable for up to 90°C maximum continuous operating temperature.

GP-90-CPE: General purpose cross-linked compound based on Chlorosulphonated polyethylene, suitable for up to 90°C maximum continuous operating temperature.

HD-85-PCP, HD-90-CSP or HD-90-CPE is the heavy duty version of GP-85-PCP, GP-90-CSP or GP-90-CPE, and XHD is the extra-heavy duty version, the characteristic of which are as follows:

Test (except for D and E, per AS/NZS 1802/AS/NZS 2802)		GP-85-PCP	HD-85-PCP	XHD-85-PCP
A	Mechanical tests without ageing	-	-	-
1	Tensile strength (MPa)	≥8,5	≥11	≥12,5
2	Elongation at rupture (percent)	≥250	≥250	≥300
3	Tear resistance (N/mm)	–	≥5	≥7
B	Mechanical tests after ageing in air oven	-	-	-
1	Tensile strength (MPa)	≥6,2	≥8,5	≥8,5
2	Elongation at rupture (percent)	≥125	≥125	≥150
C	Oil immersion test	-	-	-
1	Tensile strength (percentage of values found in unaged specimens)	≥60	≥60	≥60
2	Elongation at rupture (percentage of values found in unaged specimens)	≥60	≥60	≥60
D	Hot set test at 200±3 °C, 200kPa for 15mins	-	-	-
1	Elongation under load, maximum (percent)	≤175	≤175	≤175
2	Elongation after cooling, maximum (percent)	≤20	≤20	≤20

CORE IDENTIFICATION OF REELING & TRAILING CABLE

1. Identification And Rotational Sequence

Type No.	Rotational sequence of core colours
209*	Red, White, Blue
210*	Red, White, Blue
240	Red, Grey, White, Grey, Blue, Grey
241*	Red, Black, White, Black, Blue, Black**
245***	Red, Black, White, Black, Blue, Black**
260	Red, Grey, White, Grey, Blue, Grey
275*	Red, Black, White, Black, Blue, Black**
409	Red, White, Blue. The central pilot core is grey
412	Red, Green/Yellow, White, Green/Yellow, Blue, Green/Yellow
440	Red, Grey, White, Grey, Blue, Grey
441**	Red, Black, White, Black, Blue, Black. The central pilot core is grey
450**	Red, Black, White, Black, Blue, Grey
455	Red, Black, White, Black, Blue, Grey

* The central pilot conductor insulation in all cases is coloured grey.
** The earth conductors (Type 241, 245, 275, 441 and 450) are covered with semiconductive elastomer which is inherently black; it is not possible to assign the normal (green/yellow) earth colour identification to these conductors.
*** The central pilot/control conductor insulation are coloured grey and numbered 1, 2 and 3.

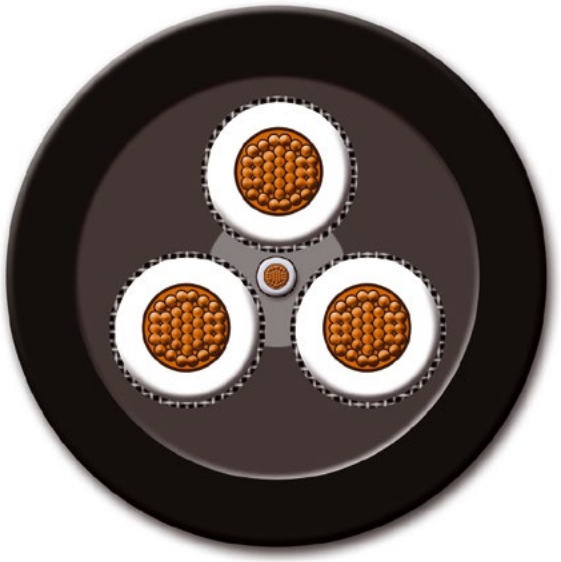
TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-209® - from 1,1/1,1 to 11/11 kV

Mainly used as a flexible trailing supply to small equipment and machinery .

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor**: Flexible stranded tinned annealed copper conductor
- **Conductor screen**: Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation:** EPR R-EP-90
- **Insulation screen:** TRATOS Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Cradle Separator**: Semiconductive PCP
- **Central Extensible Pilot**: EPR covered flexible stranded tinned copper conductor
- **Outer sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour**: black
- **Marking**: TRATOS + R-EP-90/HD-85-PCP + TYPE 209.1 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured tracers in the composite screen (Red, White, Blue). Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-209® - from 1,1/1,1 to 11/11 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 209.1 - 1,1 kV							
6	ASMTO209.1A1306	1,5	7,2	0,8	3,8	30,4	1290
10	ASMTO209.1A1310	1,5	8,6	0,8	3,8	32,9	1575
16	ASMTO209.1A1316	1,6	9,6	0,8	4,0	36,2	1967
25	ASMTO209.1A1325	1,6	11,3	0,8	4,3	39,7	2555
35	ASMTO209.1A1335	1,6	12,4	0,8	4,6	43,9	3130
50	ASMTO209.1A1350	1,7	14,1	0,8	5,0	47,9	3866
70	ASMTO209.1A1370	1,8	16,5	0,8	5,4	53,5	5041
95	ASMTO209.1A1395	2,0	18,2	0,8	6,0	58,9	6056
120	ASMTO209.1A130A	2,1	20,3	0,8	6,4	64,9	7419
150	ASMTO209.1A130B	2,3	22,3	0,8	6,9	71,2	8975
185	ASMTO209.1A130C	2,5	30,2	0,8	7,4	77,9	10935
240	ASMTO209.1A130D	2,8	33,6	0,8	8,2	86,8	13671
300	ASMTO209.1A130E	3,0	50,1	0,8	8,8	95,7	17175
Type 209.3 - 3,3 kV							
16	ASMTO209.3B1316	3,0	13,1	0,8	5,3	46,4	3030
25	ASMTO209.3B1325	3,0	14,8	0,8	5,6	50,7	3670
35	ASMTO209.3B1335	3,0	15,8	0,8	5,9	53,3	4290
50	ASMTO209.3B1350	3,0	17,2	0,8	6,3	57,8	5060
70	ASMTO209.3B1370	3,0	18,6	0,8	6,6	62,7	6270
95	ASMTO209.3B1395	3,0	20,3	0,8	7,1	66,9	7210
120	ASMTO209.3B130A	3,0	27,2	0,8	7,4	72,6	8810
150	ASMTO209.3B130B	3,0	39,6	0,8	7,8	78,7	10780
185	ASMTO209.3B130C	3,0	42,2	0,8	8,2	83,9	12420
240	ASMTO209.3B130D	3,0	46,6	0,8	8,8	91,3	15050
300	ASMTO209.3B130E	3,0	63,2	0,8	9,4	98,9	18500
Type 209.6 - 6,6 kV							
16	ASMTO209.6C1316	5,0	17,2	0,8	6,4	57,2	4367
25	ASMTO209.6C1325	5,0	18,6	0,8	6,7	61,7	5130
35	ASMTO209.6C1335	5,0	18,6	0,8	7,0	64,9	5836
50	ASMTO209.6C1350	5,0	21,3	0,8	7,3	69,1	6691
70	ASMTO209.6C1370	5,0	23,4	0,8	7,7	73,7	7997
95	ASMTO209.6C1395	5,0	29,2	0,8	8,1	78,3	9359
120	ASMTO209.6C130A	5,0	31,7	0,8	8,5	83,7	10930
150	ASMTO209.6C130B	5,0	45,7	0,8	8,9	89,5	13120
185	ASMTO209.6C130C	5,0	48,4	0,8	9,3	94,7	14850
240	ASMTO209.6C130D	5,0	52,8	0,8	9,9	101,4	17540
300	ASMTO209.6C130E	5,0	71,5	0,8	10,4	109,8	21290
Type 209.11- 11,11kV							
25	ASMTO209.11D1325	7,6	23,7	0,8	8,1	75,8	7510
35	ASMTO209.11D1335	7,6	30,2	0,8	8,4	79,9	8610
50	ASMTO209.11D1350	7,6	31,7	0,8	8,7	84,2	9660
70	ASMTO209.11D1370	7,6	34,1	0,8	9,1	89,3	10980
95	ASMTO209.11D1395	7,6	47,5	0,8	9,6	93,8	12695
120	ASMTO209.11D130A	7,6	51,0	0,8	9,9	98,7	14380
150	ASMTO209.11D130B	7,6	53,7	0,8	10,3	103,9	16175
185	ASMTO209.11D130C	7,6	57,2	0,8	10,7	108,8	18330

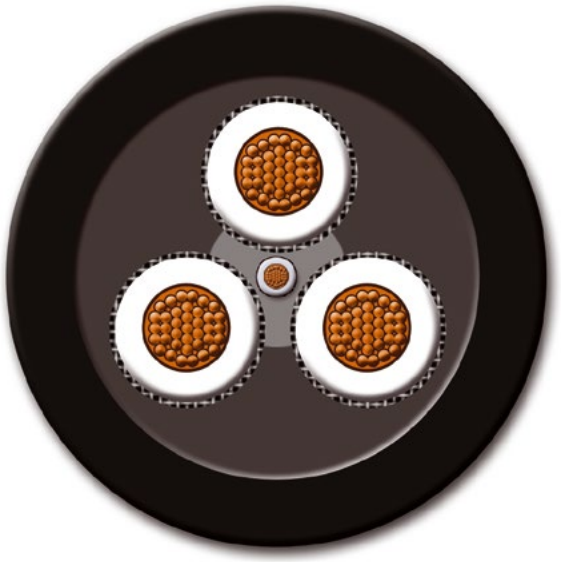
TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-210® - 1,1/1,1 kV

Mainly used as a min e feeder cable or supply to a longwall face. Cable contains 3 large pilots and large Core Screens provide for low resistance earthing .

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor**: Flexible stranded tinned annealed copper conductor
- **Insulation:** EPR R-EP-90
- **Insulation screen**: Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Cradle Separator**: Semiconductive PCP
- **Central Extensible Pilot**: EPR covered flexible stranded tinned copper conductor
- **Outer sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour**: black
- **Marking**: TRATOS + R-EP-90/HD-85-PCP + TYPE 210.1 + 2013 + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured tracers in the composite screen (Red, White, Blue). Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-210® - 1,1/1,1 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
1,5	ASMTO210A1301	1,4	5,2	0,8	3,0	23,9	840
2,5	ASMTO210A1302	1,5	5,8	0,8	3,0	25,5	925

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-240® - from 1,1/1,1 to 11/11 kV

Mainly used as feeder cables for power supply to machinery or longwall supply. Cable contains 3 large pilots and large Core Screens provide for low resistance earthing.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Flexible stranded tinned annealed copper conductor
- **Conductor screen**: Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation**: EPR R-EP-90
- **Insulation screen**: Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Interstitial Pilot**: EPR covered flexible stranded tinned copper conductor
- **Cradle Separator**: Semiconductive PCP
- **Outer sheath**: TRATOS OUTER SHEATH®, better than Heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour**: black
- **Marking**: TRATOS + R-EP-90/HD-85-PCP + TYPE 240.3 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured tracers in the composite screen (Red, White, Blue).
  Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-240® - from 1,1/1,1 to 11/11 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 240.1 - 1,1 kV							
6	ASMTO240.1A1306	1,5	7,2	1,0	3,8	30,6	1330
10	ASMTO240.1A1310	1,5	8,6	1,0	3,8	33,1	1620
16	ASMTO240.1A1316	1,6	9,6	1,0	4,0	35,9	2040
25	ASMTO240.1A1325	1,6	11,3	1,2	4,3	39,7	2690
35	ASMTO240.1A1335	1,6	12,4	1,2	4,6	43,7	3270
50	ASMTO240.1A1350	1,7	14,1	1,2	5,0	48,1	4060
70	ASMTO240.1A1370	1,8	16,5	1,2	5,4	54,5	5380
95	ASMTO240.1A1395	2,0	18,2	1,2	6,0	58,9	6410
120	ASMTO240.1A130A	2,1	20,3	1,4	6,4	65,4	7790
150	ASMTO240.1A130B	2,3	22,3	1,4	6,9	70,9	9470
185	ASMTO240.1A130C	2,5	30,2	1,4	7,4	78,1	11590
240	ASMTO240.1A130D	2,8	33,6	1,6	8,2	86,8	14500
300	ASMTO240.1A130E	3,0	50,1	1,6	8,8	95,7	18195
Type 240.3 - 3,3 kV							
16	ASMTO240.3B1316	3,0	13,1	1,4	5,3	46,8	3075
25	ASMTO240.3B1325	3,0	14,8	1,4	5,6	50,6	3800
35	ASMTO240.3B1335	3,0	15,8	1,4	5,9	53,9	4480
50	ASMTO240.3B1350	3,0	17,2	1,4	6,3	58,1	5260
70	ASMTO240.3B1370	3,0	18,6	1,4	6,6	62,9	6590
95	ASMTO240.3B1395	3,0	20,3	1,4	7,1	66,6	7530
120	ASMTO240.3B130A	3,0	27,2	1,6	7,4	72,4	9140
150	ASMTO240.3B130B	3,0	39,6	1,6	7,8	78,9	11210
185	ASMTO240.3B130C	3,0	42,2	1,8	8,2	83,8	12890
240	ASMTO240.3B130D	3,0	46,6	1,8	8,8	90,7	15470
300	ASMTO240.3B130E	3,0	63,2	1,8	9,4	99,4	19310
Type 240.6 - 6,6 kV							
16	ASMTO240.6C1316	5,0	17,2	1,4	6,4	57,9	4460
25	ASMTO240.6C1325	5,0	18,6	1,4	6,7	61,6	5280
35	ASMTO240.6C1335	5,0	18,6	1,6	7,0	64,8	5960
50	ASMTO240.6C1350	5,0	21,3	1,6	7,3	68,9	6870
70	ASMTO240.6C1370	5,0	23,4	1,6	7,7	74,4	8340
95	ASMTO240.6C1395	5,0	29,2	1,6	8,1	78,5	9560
120	ASMTO240.6C130A	5,0	31,7	1,8	8,5	83,9	11210
150	ASMTO240.6C130B	5,0	45,7	1,8	8,9	90,8	13390
185	ASMTO240.6C130C	5,0	48,4	1,8	9,3	95,3	15210
240	ASMTO240.6C130D	5,0	52,8	1,8	9,9	101,9	18190
300	ASMTO240.6C130E	5,0	71,5	1,8	10,4	110,3	21980
Type 240.11 - 11,11 kV							
25	ASMTO240.11D1325	7,6	23,7	2,0	8,1	76,1	7550
35	ASMTO240.11D1335	7,6	30,2	2,0	8,4	79,9	8660
50	ASMTO240.11D1350	7,6	31,7	2,0	8,7	84,1	9650
70	ASMTO240.11D1370	7,6	34,1	2,0	9,1	88,9	11280
95	ASMTO240.11D1395	7,6	47,5	2,0	9,6	94,3	13100
120	ASMTO240.11D130A	7,6	51,0	2,2	9,9	99,6	14795
150	ASMTO240.11D130B	7,6	53,7	2,2	10,3	104,5	16600
185	ASMTO240.11D130C	7,6	57,2	2,2	10,7	110,8	18870

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-241® - from 1,1/1,1 to 11/11 kV

A very popular cable for general use in a mine such as pumps and power supply to a range of equipment including use in monorail systems. Electrically symmetrical.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Conductor screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation:** EPR R-EP-90
- **Insulation screen:** Semiconductive elastomer
- **Cradle Separator:** Semiconductive PCP
- **Overall Core Screen:** Semiconductive PCP filling and covering.
- **Interstitial Earth Conductor:** Semiconductive PCP covered flexible stranded tinned copper conductor.
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor.
- **Textile Reinforcement:** Open-weave braid reinforcement.
- **Outer sheath:** TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 241.11 + YEAR + SIZE + Metre Mark
- **Core Identification** - *1.1/1.1 kV and 3.3/3.3 kV:*
  Power core identification by coloured insulation (Red, White, Blue). Interstitial Earth Cores coloured covering (Black).
  Central Pilot Core identification coloured insulation (Grey).
- **Core Identification** - *6.6/6.6 kV and higher voltages:*
  Power core identification printed core numbers on the black semiconductive insulation screen.
  Interstitial Earth Cores coloured covering (Black).
  Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-241® - 1,1/1,1 to 11/11 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath* mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 241.1 - 1,1 kV							
6	ASMTO241.1A1306	1,5	1,0	0,8	3,8	28,3	1040
10	ASMTO241.1A1310	1,5	1,0	0,8	3,8	30,9	1290
16	ASMTO241.1A1316	1,6	1,0	0,8	3,9	34,3	1660
25	ASMTO241.1A1325	1,6	1,0	0,8	4,2	37,8	2210
35	ASMTO241.1A1335	1,6	1,0	0,8	4,4	41,8	2580
50	ASMTO241.1A1350	1,7	1,0	0,8	4,9	46,2	3340
70	ASMTO241.1A1370	1,8	1,0	0,8	5,3	52,8	4870
95	ASMTO241.1A1395	2,0	1,0	0,8	5,8	57,3	6080
120	ASMTO241.1A130A	2,1	1,2	0,8	6,3	63,2	7190
150	ASMTO241.1A130B	2,3	1,2	0,8	6,7	68,9	8750
185	ASMTO241.1A130C	2,5	1,4	0,8	7,3	75,6	10330
240	ASMTO241.1A130D	2,8	1,4	0,8	8,0	83,8	13090
300	ASMTO241.1A130E	3,0	1,4	0,8	8,7	91,9	16110
Type 241.3 - 3,3 kV							
16	ASMTO241.3B1316	3,0	1,0	0,8	5,0	44,2	2470
25	ASMTO241.3B1325	3,0	1,0	0,8	5,3	47,4	3180
35	ASMTO241.3B1335	3,0	1,0	0,8	5,6	51,4	3770
50	ASMTO241.3B1350	3,0	1,2	0,8	6,0	55,6	4550
70	ASMTO241.3B1370	3,0	1,2	0,8	6,4	60,6	5790
95	ASMTO241.3B1395	3,0	1,2	0,8	6,8	63,4	6810
120	ASMTO241.3B130A	3,0	1,2	0,8	7,2	69,5	8160
150	ASMTO241.3B130B	3,0	1,2	0,8	7,6	73,1	9610
185	ASMTO241.3B130C	3,0	1,4	0,8	8,0	79,7	11390
240	ASMTO241.3B130D	3,0	1,4	0,8	8,6	86,5	13920
300	ASMTO241.3B130E	3,0	1,4	0,8	9,1	93,4	16710
Type 241.6 - 6,6 kV							
16	ASMTO241.6C1316	5,0	1,4	0,8	6,1	54,9	3660
25	ASMTO241.6C1325	5,0	1,4	0,8	6,4	58,8	4430
35	ASMTO241.6C1335	5,0	1,4	0,8	6,7	62,2	5110
50	ASMTO241.6C1350	5,0	1,4	0,8	7,1	66,2	5950
70	ASMTO241.6C1370	5,0	1,4	0,8	7,4	71,2	7310
95	ASMTO241.6C1395	5,0	1,4	0,8	7,9	74,8	8400
120	ASMTO241.6C130A	5,0	1,4	0,8	8,3	80,2	9960
150	ASMTO241.6C130B	5,0	1,4	0,8	8,6	84,6	11480
185	ASMTO241.6C130C	5,0	1,4	0,8	9,0	90,0	13180
240	ASMTO241.6C130D	5,0	1,4	0,8	9,6	96,8	15840
300	ASMTO241.6C130E	5,0	1,4	0,8	10,2	103,6	19110
Type 241.11 - 11,11 kV							
25	ASMTO241.11D1325	7,6	1,8	0,8	7,8	73,7	6460
35	ASMTO241.11D1335	7,6	1,8	0,8	8,1	77,0	7270
50	ASMTO241.11D1350	7,6	1,8	0,8	8,5	81,1	8280
70	ASMTO241.11D1370	7,6	1,8	0,8	8,9	86,3	9770
95	ASMTO241.11D1395	7,6	1,8	0,8	9,3	89,7	10940
120	ASMTO241.11D130A	7,6	1,8	0,8	9,7	94,9	12660
150	ASMTO241.11D130B	7,6	1,8	0,8	10,0	99,5	14330
185	ASMTO241.11D130C	7,6	1,8	0,8	10,4	104,4	16210

* Includes SC PCP layer

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-245® - from 1,1/1,1 to 3,3/3,3 kV

Specially designed for use as longwall shearer cables, and also used for continuous miners and peripheral longwall cables. Cable has 3 central pilots for earth continuity monitoring and for control circuits .

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Conductor Screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Cradle Separator:** Semiconductive PCP
- **Overall Core Screen:** Semiconductive PCP filling and covering
- **Interstitial Earth Conductor:** Semiconductive PCP covered flexible stranded tinned copper conductor
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement:** Open-weave braid reinforcement
- **Outer sheath:** TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85_PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 245.3 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured insulation (Red, White, Blue).
  Interstitial Earth Cores coloured covering (Black).
  Central Pilot Cores identification printed core numbers on the coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-245® - from 1,1/1,1 to 3,3/3,3kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath* mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 245.1 - 1,1 kV							
16	ASMTO245.1A1316	2,0	1,8	0,8	4,1	42,8	2370
25	ASMTO245.1A1325	1,6	1,8	0,8	4,2	44,0	2720
35	ASMTO245.1A1335	1,6	1,4	0,8	4,4	45,8	3180
50	ASMTO245.1A1350	1,7	1,0	0,8	4,8	48,7	3940
70	ASMTO245.1A1370	1,8	1,0	0,8	5,1	54,2	5070
95	ASMTO245.1A1395	2,0	1,0	0,8	5,6	60,7	6320
120	ASMTO245.1A130A	2,1	1,2	0,8	6,0	65,9	7680
150	ASMTO245.1A130B	2,3	1,2	0,8	6,3	70,8	9190
Type 245.3 - 3,3 kV							
25	ASMTO245.3B1325	3,0	1,5	0,8	5,2	51,4	3395
35	ASMTO245.3B1335	3,0	1,0	0,8	5,4	54,9	3990
50	ASMTO245.3B1350	3,0	1,0	0,8	5,7	57,3	4925
70	ASMTO245.3B1370	3,0	1,2	0,8	6,0	61,9	5960
95	ASMTO245.3B1395	3,0	1,2	0,8	6,4	66,8	7430
120	ASMTO245.3B130A	3,0	1,2	0,8	6,7	71,9	8760
150	ASMTO245.3B130B	3,0	1,2	0,8	7,0	75,6	10290

* Includes SC PCP layer

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-260® - from 1,1/1,1 to 11 kV

Armoured cables mainly used as feeder cables for power supply where maximum mechanical protection and strength is required. Can also be the feeder to machinery and i.e. transportable mining substation.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Conductor Screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Cradle Separator:** Semiconductive PCP
- **Interstitial Pilot:** EPR covered flexible stranded tinned copper conductor
- **Inner Sheath:** PCP sheath (GP-85-PCP). CPE/CSP sheath can be offered upon request
- **Pliable Armour:** Galvanized low carbon (mild) steel strands
- **Outer sheath:** TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 260.1 + 2013 + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured tracers in the composite screen (Red, White, Blue).
  Pilot Cores identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-260® - from 1,1/1,1 to 11/11 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm	Thickness of Pilot Conductor Covering mm	Thickness of Inner Sheath mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 260.1 - 1,1 kV								
6	ASMTO260.1A1306	1,5	7,2	1,0	2,0	3,8	37,1	2360
10	ASMTO260.1A1310	1,5	8,6	1,0	2,0	3,8	39,9	2660
16	ASMTO260.1A1316	1,6	9,6	1,0	2,5	4,0	46,7	4140
25	ASMTO260.1A1325	1,6	11,3	1,2	2,5	4,3	50,9	4960
35	ASMTO260.1A1335	1,6	12,4	1,2	2,5	4,6	54,3	5780
50	ASMTO260.1A1350	1,7	14,1	1,2	2,5	5,0	58,7	6810
70	ASMTO260.1A1370	1,8	16,5	1,2	2,5	5,4	65,1	8390
95	ASMTO260.1A1395	2,0	18,2	1,2	3,5	6,0	71,8	10060
120	ASMTO260.1A130A	2,1	20,3	1,4	3,5	6,4	77,6	11790
150	ASMTO260.1A130B	2,3	22,3	1,4	3,5	6,9	83,7	13790
185	ASMTO260.1A130C	2,5	30,2	1,4	3,5	7,4	90,5	16180
240	ASMTO260.1A130D	2,8	33,6	1,6	4,5	8,2	104,0	21560
300	ASMTO260.1A130E	3,0	50,1	1,6	4,5	8,8	113,3	25940
Type 260.3 - 3,3 kV								
16	ASMTO260.3B1316	3,0	13,1	1,4	2,5	5,3	57,4	5670
25	ASMTO260.3B1325	3,0	14,8	1,4	2,5	5,6	60,9	6630
35	ASMTO260.3B1335	3,0	15,8	1,4	3,5	5,9	66,8	7820
50	ASMTO260.3B1350	3,0	17,2	1,4	3,5	6,3	70,9	8890
70	ASMTO260.3B1370	3,0	18,6	1,4	3,5	6,6	75,6	10470
95	ASMTO260.3B1395	3,0	20,3	1,4	3,5	7,1	79,5	11590
120	ASMTO260.3B130A	3,0	27,2	1,6	3,5	7,4	85,0	13540
150	ASMTO260.3B130B	3,0	39,6	1,6	4,5	7,8	95,6	17830
185	ASMTO260.3B130C	3,0	42,2	1,8	4,5	8,2	101,2	19990
240	ASMTO260.3B130D	3,0	46,6	1,8	4,5	8,8	107,9	23100
300	ASMTO260.3B130E	3,0	63,2	1,8	4,5	9,4	116,2	27190
Type 260.6 - 6,6 kV								
16	ASMTO260.6C1316	5,0	17,2	1,4	3,5	6,4	70,6	7980
25	ASMTO260.6C1325	5,0	18,6	1,4	3,5	6,7	74,4	8980
35	ASMTO260.6C1335	5,0	18,6	1,6	3,5	7,0	77,7	9940
50	ASMTO260.6C1350	5,0	21,3	1,6	3,5	7,3	81,8	11060
70	ASMTO260.6C1370	5,0	23,4	1,6	4,5	7,7	91,3	14590
95	ASMTO260.6C1395	5,0	29,2	1,6	4,5	8,1	94,9	16160
120	ASMTO260.6C130A	5,0	31,7	1,8	4,5	8,5	101,2	18100
150	ASMTO260.6C130B	5,0	45,7	1,8	4,5	8,9	106,9	20870
185	ASMTO260.6C130C	5,0	48,4	1,8	4,5	9,3	112,4	23110
240	ASMTO260.6C130D	5,0	52,8	1,8	4,5	9,9	118,9	26390
300	ASMTO260.6C130E	5,0	71,5	1,8	4,5	10,4	127,3	30710
Type 260.11 - 11,11 kV								
25	ASMTO260.11D1325	7,6	23,7	2,0	4,5	8,1	92,9	13860
35	ASMTO260.11D1335	7,6	30,2	2,0	4,5	8,4	97,3	15330
50	ASMTO260.11D1350	7,6	31,7	2,0	4,5	8,7	100,9	16690
70	ASMTO260.11D1370	7,6	34,1	2,0	4,5	9,1	106,3	18760
95	ASMTO260.11D1395	7,6	47,5	2,0	4,5	9,6	110,9	20880
120	ASMTO260.11D130A	7,6	51,0	2,2	4,5	9,9	116,2	22970
150	ASMTO260.11D130B	7,6	53,7	2,2	4,5	10,3	120,8	25160
185	ASMTO260.11D130C	7,6	57,2	2,2	4,5	10,7	126,6	27580

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 1802:2003

TRATOS ASNZS MTO-275® - 1,1/1,1 kV

Specifically designed for use as a flexible feeder for shuttle cars but is also suitable for other applications where flexibility is required.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Insulation:** EPR R-EP-90
- **Cradle Separator:** Semiconductive PCP
- **Overall Core Screen:** Semiconductive PCP filling and covering
- **Interstitial Earth Conductor:** Semiconductive PCP covered flexible stranded tinned copper conductor
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement:** Open-weave braid reinforcement
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 275.1 + 2013 + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured insulation (Red, White, Blue).
  Interstitial Earth Cores coloured covering (Black).
  Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 1802:2003
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-275® - 1,1/1,1 kV

Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath* mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
16	ASMTO275A1316	1,6	1,0	0,8	3,8	30,8	1465
25	ASMTO275A1325	1,6	1,0	0,8	4,0	34,3	2070
35	ASMTO275A1335	1,6	1,0	0,8	4,3	38,4	2745
50	ASMTO275A1350	1,7	1,0	0,8	4,7	42,1	3360

* Includes SC PCP layer

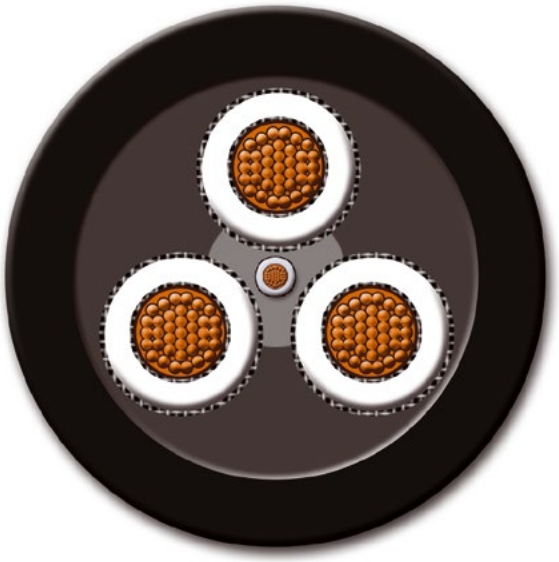
TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-409® - Class 2 - from 1,1/1,1 to 22/22 kV

A popular cable for use as a flexible trailing feeder cable to mobile equipment such as draglines, drills and face shovels.
Electrically symmetrical.

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Conductor Screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Cradle Separator:** Semiconductive PCP
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 409.6 + YEAR + SIZE + Metre Mark
- **Core Identification**- *1.1/1.1 kV:* Power core identification by coloured insulation (Red, White, Blue).
  Central Pilot Core identification coloured insulation (Grey).
- **Core Identification** - *3.3/3.3 kV and higher voltages:*
  Power core identification by coloured tracers in the composite screen (Red, White, Blue).
  Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-409® - Class 2 - from 1,1/1,1 to 22/22 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 409.1 Class2 - 1,1 kV							
6	ASMTO409.1A1306	1,5	7,2	0,8	3,8	30,4	1295
10	ASMTO409.1A1310	1,5	8,6	0,8	3,8	32,9	1590
16	ASMTO409.1A1316	1,6	9,6	0,8	4,0	36,1	1980
25	ASMTO409.1A1325	1,6	11,3	0,8	4,3	39,8	2570
35	ASMTO409.1A1335	1,6	12,4	0,8	4,6	43,6	3160
50	ASMTO409.1A1350	1,7	14,1	0,8	5,0	47,9	3890
70	ASMTO409.1A1370	1,8	16,5	0,8	5,4	54,3	5070
95	ASMTO409.1A1395	2,0	21,8	0,8	6,0	59,5	6280
120	ASMTO409.1A130A	2,1	24,7	0,8	6,4	65,7	7640
150	ASMTO409.1A130B	2,3	36,1	0,8	6,9	72,5	9630
185	ASMTO409.1A130C	2,5	40,5	0,8	7,4	78,9	11690
240	ASMTO409.1A130D	2,8	57,7	0,8	8,2	89,1	14980
300	ASMTO409.1A130E	3,0	63,2	0,8	8,8	96,7	18100
Type 409.3 Class2 - 3,3 kV							
16	ASMTO409.3B1316	3,0	13,1	0,8	5,3	46,6	3030
25	ASMTO409.3B1325	3,0	14,8	0,8	5,6	50,5	3740
35	ASMTO409.3B1335	3,0	15,8	0,8	5,9	53,9	4360
50	ASMTO409.3B1350	3,0	17,2	0,8	6,3	58,0	5140
70	ASMTO409.3B1370	3,0	18,6	0,8	6,6	62,8	6280
95	ASMTO409.3B1395	3,0	20,3	0,8	7,1	66,5	7290
120	ASMTO409.3B130A	3,0	27,2	0,8	7,4	72,8	8860
150	ASMTO409.3B130B	3,0	39,6	0,8	7,8	79,0	10820
185	ASMTO409.3B130C	3,0	42,2	0,8	8,2	83,9	12580
240	ASMTO409.3B130D	3,0	46,6	0,8	8,8	90,7	15070
300	ASMTO409.3B130E	3,0	63,2	0,8	9,4	98,8	18490
Type 409.6 Class2 - 6,6 kV							
16	ASMTO409.6C1316	5,0	17,2	0,8	6,4	57,6	4430
25	ASMTO409.6C1325	5,0	18,6	0,8	6,7	61,5	5190
35	ASMTO409.6C1335	5,0	18,6	0,8	7,0	64,9	5860
50	ASMTO409.6C1350	5,0	21,3	0,8	7,3	69,0	6720
70	ASMTO409.6C1370	5,0	23,4	0,8	7,7	73,9	8080
95	ASMTO409.6C1395	5,0	29,2	0,8	8,1	78,2	9370
120	ASMTO409.6C130A	5,0	31,7	0,8	8,5	83,6	10960
150	ASMTO409.6C130B	5,0	45,7	0,8	8,9	89,8	13170
185	ASMTO409.6C130C	5,0	48,4	0,8	9,3	94,7	14840
240	ASMTO409.6C130D	5,0	52,8	0,8	9,9	101,9	17530
300	ASMTO409.6C130E	5,0	71,5	0,8	10,4	110,3	21290
Type 409.11 Class2 - 11,11 kV							
25	ASMTO409.11D1325	7,6	23,7	0,8	8,1	75,8	7520
35	ASMTO409.11D1335	7,6	30,2	0,8	8,4	79,9	8630
50	ASMTO409.11D1350	7,6	31,7	0,8	8,7	83,8	9570
70	ASMTO409.11D1370	7,6	34,1	0,8	9,1	89,2	11090
95	ASMTO409.11D1395	7,6	47,5	0,8	9,6	93,8	12960
120	ASMTO409.11D130A	7,6	51,0	0,8	9,9	99,3	14680
150	ASMTO409.11D130B	7,6	53,7	0,8	10,3	103,9	16390
185	ASMTO409.11D130C	7,6	57,2	0,8	10,7	109,6	18350
Type 409.22 Class2 - 22,22 kV							
35	ASMTO409.22E1335	10,5	55,4	0,8	10,0	105,5	14070
50	ASMTO409.22E1350	10,5	58,1	0,8	10,3	109,4	15350
70	ASMTO409.22E1370	10,5	60,7	0,8	10,7	114,6	17220

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-412® - Class 2 - 1,1/1,1 kV

Cables with green/yellow earths and pliable armour for mechanical protection. Main applications are where damage is likely and armour can reduce cases of costly downtime. Suitable to be installed as feeder cables in sand mining operations.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Filler:** Elastomer centre filler
- **Interstitial Earth Conductor:** EPR covered flexible stranded tinned copper conductor
- **Inner Sheath:** PCP sheath. CPE/CSP sheath can be offered upon request
- **Pliable Armour:** Galvanized low carbon (mild) steel strands
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 412.1 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured insulation (Red, White, Blue).
  Interstitial Earth Cores coloured covering (Black).

STANDARDS

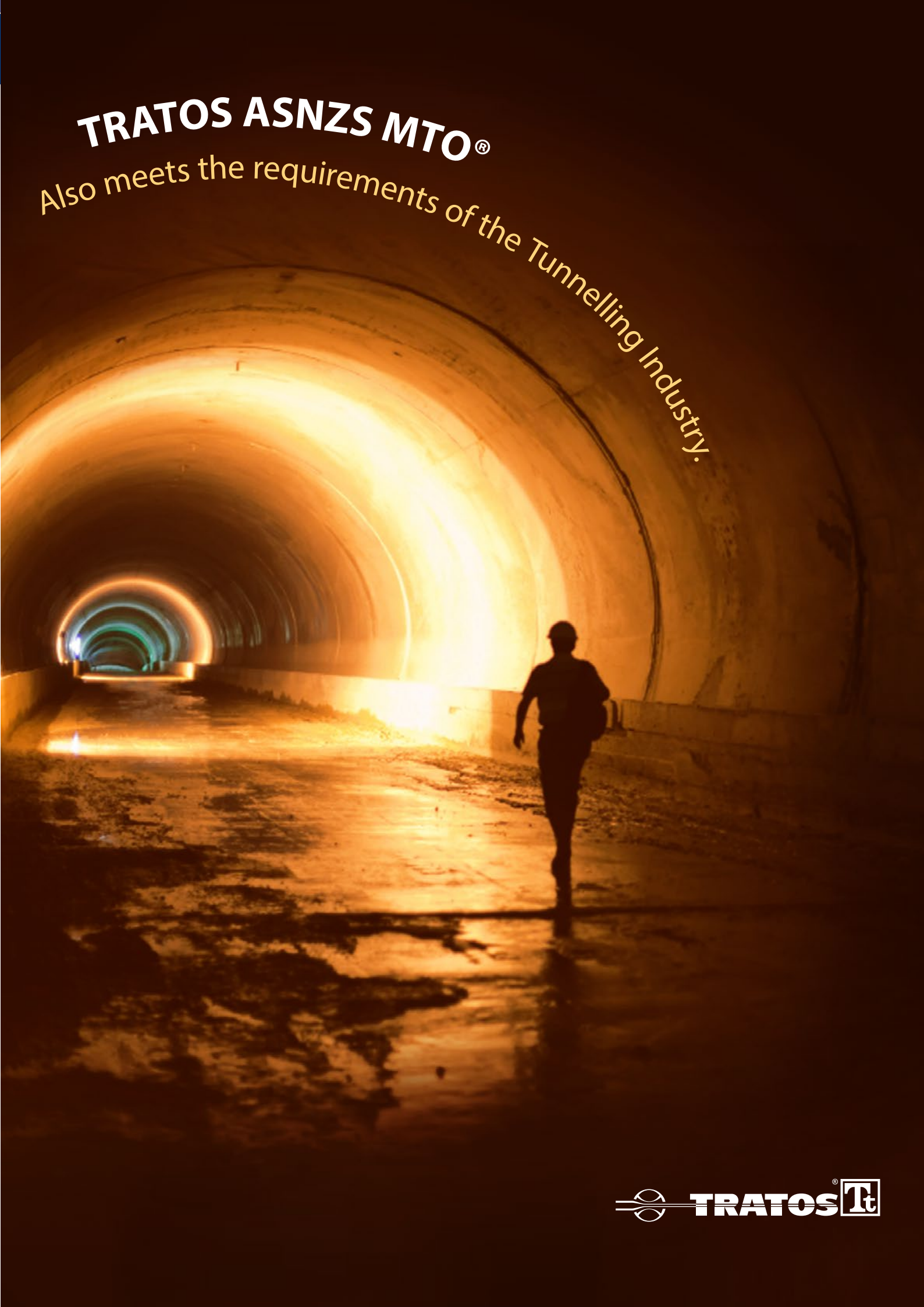
- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-412® - Class 2 - 1,1/1,1 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm²	Thickness of Inner Sheath mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
16	ASMTO412A1316	1,6	0,6	2,5	3,8	38,4	2675
25	ASMTO412A1325	1,6	0,6	2,5	3,8	38,7	2950
35	ASMTO412A1335	1,6	0,6	2,5	4,0	44,9	4040
50	ASMTO412A1350	1,7	0,8	2,5	4,4	49,4	5040
70	ASMTO412A1370	1,8	0,8	2,5	4,8	55,9	6570
95	ASMTO412A1395	2,0	0,8	2,5	5,4	60,4	7760
120	ASMTO412A130A	2,1	1,0	3,5	5,8	68,6	9990
150	ASMTO412A130B	2,3	1,0	3,5	6,3	74,1	11890
185	ASMTO412A130C	2,5	1,0	3,5	6,8	80,8	13670
240	ASMTO412A130D	2,8	1,2	3,5	7,5	88,9	16800
300	ASMTO412A130E	3,0	1,2	4,5	8,2	101,7	22150

TRATOS ASNZS MTO®

Also meets the requirements of the Tunnelling Industry.



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TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-440® - Class 2 - from 1,1/1,1 to 22/22 kV

Mainly used as flexible feeder trailing cables for power supply to machinery and equipment. Include 3 large pilots and a central semiconductive cradle for support and protection of power cores.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Conductor Screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above).
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Cradle Separator:** Semiconductive PCP
- **Interstitial Pilot:** EPR covered flexible stranded tinned copper conductor
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (HD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 440.11 + YEAR + SIZE + Metre Mark
- **Core Identification** - *1.1/1.1 kV:* Power core identification by coloured insulation. (Red, White, Blue).
  Interstitial Pilot Core identification coloured insulation (Grey).
- **Core Identification** - *3.3/3.3 kV and higher voltages:*
  Power core identification by coloured tracers in the composite screen (Red, White, Blue).
  Interstitial Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-440® - Class 2 - from 1,1/1,1 to 22/22 kV

Nominal Cross Sectional Area mm²	Part Number (TT)	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 440.1 Class2 - 1,1 kV							
6	ASMTO440.1A1306	1,5	7,2	1,0	3,8	30,3	1360
10	ASMTO440.1A1310	1,5	8,6	1,0	3,8	32,7	1680
16	ASMTO440.1A1316	1,6	9,6	1,0	4,0	36,1	2050
25	ASMTO440.1A1325	1,6	11,3	1,2	4,3	39,9	2730
35	ASMTO440.1A1335	1,6	12,4	1,2	4,6	43,5	3280
50	ASMTO440.1A1350	1,7	14,1	1,2	5,0	47,8	4080
70	ASMTO440.1A1370	1,8	16,5	1,2	5,4	54,4	5440
95	ASMTO440.1A1395	2,0	21,8	1,2	6,0	59,6	6630
120	ASMTO440.1A130A	2,1	24,7	1,4	6,4	65,8	8070
150	ASMTO440.1A130B	2,3	36,1	1,4	6,9	72,4	10280
185	ASMTO440.1A130C	2,5	40,5	1,4	7,4	78,9	11990
240	ASMTO440.1A130D	2,8	57,7	1,6	8,2	89,0	15610
300	ASMTO440.1A130E	3,0	63,2	1,6	8,8	96,9	18790
Type 440.3 Class2 - 3,3 kV							
16	ASMTO440.3B1316	3,0	13,1	1,4	5,3	46,4	3045
25	ASMTO440.3B1325	3,0	14,8	1,4	5,6	50,4	3820
35	ASMTO440.3B1335	3,0	15,8	1,4	5,9	53,8	4490
50	ASMTO440.3B1350	3,0	17,2	1,4	6,3	57,9	5280
70	ASMTO440.3B1370	3,0	18,6	1,4	6,6	63,0	6630
95	ASMTO440.3B1395	3,0	20,3	1,6	7,1	66,6	7580
120	ASMTO440.3B130A	3,0	27,2	1,6	7,4	72,8	9180
150	ASMTO440.3B130B	3,0	39,6	1,6	7,8	78,4	11250
185	ASMTO440.3B130C	3,0	42,2	1,6	8,2	83,9	12940
240	ASMTO440.3B130D	3,0	46,6	1,6	8,8	90,8	15630
300	ASMTO440.3B130E	3,0	63,2	1,6	9,4	99,4	19290
Type 440.6 Class2 - 6,6 kV							
16	ASMTO440.6C1316	5,0	17,2	1,4	6,4	57,6	4460
25	ASMTO440.6C1325	5,0	18,6	1,6	6,7	61,3	5240
35	ASMTO440.6C1335	5,0	18,6	1,6	7,0	64,9	6050
50	ASMTO440.6C1350	5,0	21,3	1,6	7,3	68,9	6920
70	ASMTO440.6C1370	5,0	23,4	1,6	7,7	74,1	8380
95	ASMTO440.6C1395	5,0	29,2	1,8	8,1	77,9	9690
120	ASMTO440.6C130A	5,0	31,7	1,8	8,5	83,6	11240
150	ASMTO440.6C130B	5,0	45,7	1,8	8,9	89,4	13570
185	ASMTO440.6C130C	5,0	48,4	1,8	9,3	95,0	15320
240	ASMTO440.6C130D	5,0	52,8	1,8	9,9	101,9	18300
300	ASMTO440.6C130E	5,0	71,5	1,8	10,4	110,1	22050
Type 440.11 Class2 - 11,11 kV							
25	ASMTO440.11D1325	7,6	23,7	2,0	8,1	75,7	7600
35	ASMTO440.11D1335	7,6	30,2	2,0	8,4	79,9	8710
50	ASMTO440.11D1350	7,6	31,7	2,0	8,7	84,2	9780
70	ASMTO440.11D1370	7,6	34,1	2,0	9,1	89,0	11420
95	ASMTO440.11D1395	7,6	47,5	2,2	9,6	93,9	13210
120	ASMTO440.11D130A	7,6	51,0	2,2	9,9	99,1	14960
150	ASMTO440.11D130B	7,6	53,7	2,2	10,3	103,9	16820
185	ASMTO440.11D130C	7,6	57,2	2,2	10,7	109,8	18890
Type 440.22 Class2 - 22,22 kV							
35	ASMTO440.22E1335	10,5	53,2	2,5	10,0	106,0	12800
50	ASMTO440.22E1350	10,5	54,1	2,5	10,3	109,5	13990
70	ASMTO440.22E1370	10,5	58,0	2,5	10,7	112,8	15600

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-441® - Class 2 - 1,1/1,1 kV

Class 2 cables designed for various applications such as trailing and reeling applications. Include one central pilot and a semiconductive cradle supporting and protecting the power cores, which makes these cables less likely to be damaged from crushing and squashing.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor
- **Insulation:** EPR R-EP-90
- **Insulation Screen:** Semiconductive elastomer
- **Cradle Separator:** Semiconductive PCP
- **Overall Core Screen:** Semiconductive PCP filling and covering
- **Interstitial Earth Conductor:** Semiconductive PCP covered flexible stranded tinned copper conductor
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement:** Open-weave braid reinforcement.
- **Standard colour:** black
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty PCP sheath (XHD-85-PCP). Heavy duty CPE/CSP sheath can be offered upon request
- **Marking:** TRATOS + XR-EP-90/XHD-85-PCP + TYPE 441.1 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured insulation (Red, White, Blue).
  Interstitial Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-441® - Class 2 - 1,1/1,1 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
6	ASMTO441A1306	1,5	0,8	0,8	3,8	28,6	1130
10	ASMTO441A1310	1,5	0,8	0,8	3,8	31,6	1375
16	ASMTO441A1316	1,6	1,0	0,8	3,9	34,3	1785
25	ASMTO441A1325	1,6	1,0	0,8	4,2	38,2	2320
35	ASMTO441A1335	1,6	1,0	0,8	4,4	41,6	2770
50	ASMTO441A1350	1,7	1,0	0,8	4,9	46,3	3540
70	ASMTO441A1370	1,8	1,0	0,8	5,3	52,9	4860
95	ASMTO441A1395	2,0	1,0	0,8	5,8	56,8	5810
120	ASMTO441A130A	2,1	1,0	0,8	6,3	63,2	7280
150	ASMTO441A130B	2,3	1,2	0,8	6,7	68,9	8850
185	ASMTO441A130C	2,5	1,2	0,8	7,3	75,7	10510
240	ASMTO441A130D	2,8	1,2	0,8	8,0	83,9	13330
300	ASMTO441A130E	3,0	1,4	0,8	8,7	92,2	16320

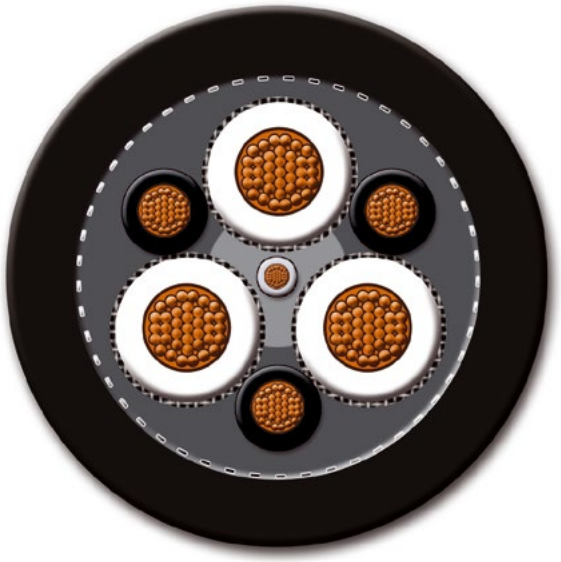
TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-441® - Class 1 - from 3,3/3,3 to 22/22 kV

Class 1 series cable has lower insulation and sheath radials than Class 2 cables. They have various applications such as trailing and reeling applications. They have one central pilot and a semiconductive cradle supporting and protecting the power cores, which makes these cables less likely to be damaged from crushing and squashing.

FEATURES AND PERFORMANCES



CONSTRUCTION

- **Conductor:** Flexible stranded tinned annealed copper conductor.
- **Conductor Screen:** Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above).
- **Insulation:** EPR XR-EP-90
- **Insulation Screen:** Semiconductive elastomer.
- **Cradle Separator:** Semiconductive PCP.
- **Overall Core Screen:** Semiconductive PCP filling and covering.
- **Interstitial Earth Conductor:** Semiconductive PCP covered flexible stranded tinned copper conductor.
- **Central Extensible Pilot:** EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement:** Open-weave braid reinforcement
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than extra-heavy duty PCP sheath (XHD-85-PCP). Extra-heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour:** black
- **Marking:** TRATOS + R-EP-90/HD-85-PCP + TYPE 441.3 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification printed core numbers on the black semiconductive insulation screen.
  Interstitial Earth Cores coloured covering (Black)
  Central Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-441® - Class 1 - from 3,3/3,3 to 22/22 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Earth Conductor Covering mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 441.3-Class1 - 3,3 kV							
16	ASMTO441.3B1316	2,2	1,0	0,8	4,6	43,5	2430
25	ASMTO441.3B1325	2,2	1,0	0,8	4,9	47,3	3047
35	ASMTO441.3B1335	2,2	1,0	0,8	5,2	50,7	3610
50	ASMTO441.3B1350	2,4	1,0	0,8	5,7	55,8	4490
70	ASMTO441.3B1370	2,4	1,0	0,8	6,0	60,9	5760
95	ASMTO441.3B1395	2,4	1,2	0,8	6,4	64,0	6630
120	ASMTO441.3B130A	2,4	1,2	0,8	6,5	68,9	7990
150	ASMTO441.3B130B	2,4	1,2	0,8	6,6	73,2	9370
185	ASMTO441.3B130C	2,4	1,4	0,8	6,7	77,7	10850
240	ASMTO441.3B130D	2,4	1,4	0,8	6,9	83,9	13200
300	ASMTO441.3B130E	2,4	1,4	0,8	7,0	89,6	15790
Type 441.6-Class1 - 6,6 kV							
16	ASMTO441.6C1316	3,0	1,0	0,8	5,0	47,5	2780
25	ASMTO441.6C1325	3,0	1,0	0,8	5,3	51,4	3530
35	ASMTO441.6C1335	3,0	1,0	0,8	5,6	54,9	4070
50	ASMTO441.6C1350	3,0	1,2	0,8	6,0	59,1	4890
70	ASMTO441.6C1370	3,0	1,2	0,8	6,3	63,9	6360
95	ASMTO441.6C1395	3,0	1,2	0,8	6,4	66,8	7090
120	ASMTO441.6C130A	3,0	1,2	0,8	6,6	71,8	8390
150	ASMTO441.6C130B	3,0	1,2	0,8	6,7	76,0	9780
185	ASMTO441.6C130C	3,0	1,4	0,8	6,8	80,8	11400
240	ASMTO441.6C130D	3,0	1,4	0,8	7,0	86,9	13680
300	ASMTO441.6C130E	3,0	1,4	0,8	7,1	92,7	16610
Type 441.11-Class1 - 11,11 kV							
25	ASMTO441.11D1325	5,0	1,2	0,8	6,3	62,5	4820
35	ASMTO441.11D1335	5,0	1,4	0,8	6,4	65,8	5480
50	ASMTO441.11D1350	5,0	1,4	0,8	6,5	68,4	6240
70	ASMTO441.11D1370	5,0	1,4	0,8	6,6	73,7	7550
95	ASMTO441.11D1395	5,0	1,4	0,8	6,8	76,7	8540
120	ASMTO441.11D130A	5,0	1,4	0,8	6,9	81,4	9900
150	ASMTO441.11D130B	5,0	1,4	0,8	7,0	85,8	11350
185	ASMTO441.11D130C	5,0	1,4	0,8	7,1	90,2	12990
240	ASMTO441.11D130D	5,0	1,4	0,8	7,3	96,5	15420
Type 441.22-Class1 - 22,22 kV							
35	ASMTO441.22E1335	7,6	1,8	0,8	6,9	78,7	7380
50	ASMTO441.22E1350	7,6	1,8	0,8	7,0	82,0	8260
70	ASMTO441.22E1370	7,6	1,8	0,8	7,1	86,8	9690
95	ASMTO441.22E1395	7,6	1,8	0,8	7,2	88,9	10740
120	ASMTO441.22E130A	7,6	1,8	0,8	7,3	94,2	12290
150	ASMTO441.22E130B	7,6	1,8	0,8	7,4	97,9	13880
185	ASMTO441.22E130C	7,6	1,8	0,8	7,6	103,4	15550

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-450® - Class 1 - from 3,3/3,3 to 33/33 kV

These cables are suitable for supply of power to a wide range of applications, from dragline cable to slow reeling applications, where copper screened cable is required but light weight and smaller dimensions are also desired.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Flexible stranded tinned annealed copper conductor
- **Conductor Screen**: Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation**: EPR XR-EP-90
- **Insulation Screen**: Semiconductive elastomer
- **Composite Screen**: Tinned annealed copper braiding interwove with polyester yarn, covered with
- semiconductive tape
- **Filler**: Elastomer centre filler
- **Interstitial Earth Conductor×2**: CSP covered flexible stranded tinned copper conductor
- **Interstitial Pilot**: EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement**: Open-weave braid reinforcement
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than extra-heavy duty PCP sheath (XHD-85-PCP). Extra-heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE 450.11 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification by coloured tracers in the composite screen (Red, White, Blue).
  Interstitial Earth Cores coloured covering (Black).
  Interstitial Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-450® - Class 1 - from 3,3/3,3 to 33/33 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot/Earth Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
Type 450.3-Class1 - 3,3 kV							
16	ASMTO450.3B1316	2,2	6,3	1,4	4,5	42,9	2680
25	ASMTO450.3B1325	2,2	8,3	1,4	4,8	47,3	3395
35	ASMTO450.3B1335	2,2	9,0	1,4	5,1	50,5	3950
50	ASMTO450.3B1350	2,4	10,0	1,4	5,6	55,8	4880
70	ASMTO450.3B1370	2,4	14,7	1,4	6,0	61,4	6390
95	ASMTO450.3B1395	2,4	15,5	1,6	6,3	64,8	7370
120	ASMTO450.3B130A	2,4	17,0	1,6	6,4	69,4	8700
150	ASMTO450.3B130B	2,4	18,1	1,6	6,6	73,5	10290
185	ASMTO450.3B130C	2,4	18,1	1,6	6,7	78,6	11780
240	ASMTO450.3B130D	2,4	26,7	1,6	6,9	84,9	14440
300	ASMTO450.3B130E	2,4	28,3	1,6	7,0	90,8	17510
Type 450.6 Class1- 6,6 kV							
16	ASMTO450.6C1316	3,0	8,3	1,4	5,0	47,8	3180
25	ASMTO450.6C1325	3,0	9,1	1,6	5,2	51,5	3840
35	ASMTO450.6C1335	3,0	9,8	1,6	5,5	54,9	4465
50	ASMTO450.6C1350	3,0	10,5	1,6	5,9	59,0	5370
70	ASMTO450.6C1370	3,0	15,5	1,6	6,3	64,7	6830
95	ASMTO450.6C1395	3,0	16,3	1,8	6,4	67,8	7750
120	ASMTO450.6C130A	3,0	17,7	1,8	6,5	72,3	9140
150	ASMTO450.6C130B	3,0	18,1	1,8	6,6	76,4	10780
185	ASMTO450.6C130C	3,0	18,1	1,8	6,8	81,5	12270
240	ASMTO450.6C130D	3,0	27,7	1,8	7,0	87,8	15100
300	ASMTO450.6C130E	3,0	28,3	1,8	7,1	93,7	17980
Type 450.11 Class1 - 11,11 kV							
25	ASMTO450.11D1325	5,0	15,1	2,0	6,3	63,3	5430
35	ASMTO450.11D1335	5,0	16,0	2,0	6,4	65,8	6020
50	ASMTO450.11D1350	5,0	17,0	2,0	6,5	69,9	6950
70	ASMTO450.11D1370	5,0	18,1	2,0	6,6	74,4	8280
95	ASMTO450.11D1395	5,0	18,1	2,2	6,7	76,9	9290
120	ASMTO450.11D130A	5,0	18,1	2,2	6,9	82,6	10880
150	ASMTO450.11D130B	5,0	27,3	2,2	7,0	86,9	12690
185	ASMTO450.11D130C	5,0	28,3	2,2	7,1	91,6	14370
240	ASMTO450.11D130D	5,0	28,3	2,2	7,3	97,3	16950
300	ASMTO450.11D130E	5,0	28,3	2,2	7,4	103,0	20100
Type 450.22 Class1 - 22,22 kV							
35	ASMTO450.22E1335	7,6	18,1	2,5	6,8	78,8	8070
50	ASMTO450.22E1350	7,6	18,1	2,5	6,9	82,4	9090
70	ASMTO450.22E1370	7,6	27,5	2,5	7,0	87,0	10760
95	ASMTO450.22E1395	7,6	28,3	2,5	7,2	90,8	11840
120	ASMTO450.22E130A	7,6	28,3	2,5	7,3	95,2	13600
150	ASMTO450.22E130B	7,6	28,3	2,5	7,4	98,9	15350
185	ASMTO450.22E130C	7,6	28,3	2,5	7,5	104,4	17070
240	ASMTO450.22E130D	7,6	28,3	2,5	7,7	101,2	19880
300	ASMTO450.22E130E	7,6	28,3	2,5	7,9	115,9	23200
Type 450.33 Class1 - 33,33 kV							
50	ASMTO450.33F1350	10,5	28,3	2,5	7,4	97,0	12320
70	ASMTO450.33F1370	10,5	28,3	2,5	7,5	101,8	13900
95	ASMTO450.33F1395	10,5	28,3	2,5	7,7	104,9	15150
120	ASMTO450.33F130A	10,5	28,3	2,5	7,8	110,0	16950
185	ASMTO450.33F130B	10,5	28,3	2,5	8,0	118,7	20820
240	ASMTO450.33F130C	10,5	28,3	2,5	8,2	124,9	23780
300	ASMTO450.33F130D	10,5	28,3	2,5	8,4	131,1	27350

TRATOS ASNZS MTO®

REELING & TRAILING CABLES BASED ON AS/NZS 2802:2000

TRATOS ASNZS MTO-455® - Class 1 - from 3,3/3,3 to 33/33 kV

Designed with reduced insulation and sheath thickness, no cradle, 2 earth and 1 pilot core (each earth and pilot are the same size) in the outer interstices. These cables are suitable for reeling and trailing applications where minimal diameter and mass is desired, particularly suited to stacker-reclaimer applications.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Flexible stranded tinned annealed copper conductor
- **Conductor Screen**: Semiconductive compound (for cables having a voltage rating of 3.3/3.3kV and above)
- **Insulation**: EPR XR-EP-90
- **Insulation Screen**: Semiconductive elastomer
- **Filler**: Elastomer centre filler
- **Interstitial Earth Conductor**: CSP covered flexible stranded tinned copper conductor
- **Interstitial Pilot**: EPR covered flexible stranded tinned copper conductor
- **Textile Reinforcement**: Open-weave braid reinforcement
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than extra-heavy duty PCP sheath (XHD-85-PCP).. Extra-heavy duty CPE/CSP sheath can be offered upon request
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE 455.6 + YEAR + SIZE + Metre Mark
- **Core Identification**: Power core identification printed core numbers on the black semiconductive insulation screen. Interstitial Earth Cores coloured covering (Black). Interstitial Pilot Core identification coloured insulation (Grey).

STANDARDS

- AS/NZS 2802:2000
- AS/NZS 1125
- AS/NZS 3808
- AS/NZS 5000.1

TRATOS ASNZS MTO-455® - Class 1- from 3,3/3,3 to 33/33 kV

Nominal Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Thickness of Pilot/ Earth Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
			Type 455.3-Class1 - 3,3 kV			
16	ASMTO455.3B1316	2,2	1,4	4,2	39,5	2260
25	ASMTO455.3B1325	2,2	1,4	4,5	43,8	2850
35	ASMTO455.3B1335	2,2	1,4	4,8	46,8	3390
50	ASMTO455.3B1350	2,4	1,4	5,3	52,3	4270
70	ASMTO455.3B1370	2,4	1,4	5,7	57,4	5590
95	ASMTO455.3B1395	2,4	1,6	6,1	60,9	6480
120	ASMTO455.3B130A	2,4	1,6	6,4	65,9	7900
150	ASMTO455.3B130B	2,4	1,6	6,5	70,3	9380
185	ASMTO455.3B130C	2,4	1,6	6,6	74,8	10790
240	ASMTO455.3B130D	2,4	1,6	6,8	81,1	13150
300	ASMTO455.3B130E	2,4	1,6	6,9	86,9	16100
			Type 455.6-Class1 - 6,6 kV			
16	ASMTO455.6C1316	3,0	1,4	4,7	44,5	2670
25	ASMTO455.6C1325	3,0	1,6	5,0	48,3	3350
35	ASMTO455.6C1335	3,0	1,6	5,3	51,7	3890
50	ASMTO455.6C1350	3,0	1,6	5,6	55,7	4680
70	ASMTO455.6C1370	3,0	1,6	6,0	60,9	5990
95	ASMTO455.6C1395	3,0	1,8	6,3	63,7	6970
120	ASMTO455.6C130A	3,0	1,8	6,5	69,0	8320
150	ASMTO455.6C130B	3,0	1,8	6,6	72,9	9790
185	ASMTO455.6C130C	3,0	1,8	6,7	77,7	11320
240	ASMTO455.6C130D	3,0	1,8	6,9	84,1	13680
300	ASMTO455.6C130E	3,0	1,8	7,0	89,9	16620
			Type 455.11-Class1 - 11,11 kV			
16	ASMTO455.11D1316	5,0	2,0	5,8	55,3	3930
25	ASMTO455.11D1325	5,0	2,0	6,1	59,5	4670
35	ASMTO455.11D1335	5,0	2,0	6,3	62,5	5300
50	ASMTO455.11D1350	5,0	2,0	6,4	65,8	6080
70	ASMTO455.11D1370	5,0	2,0	6,5	70,6	7490
95	ASMTO455.11D1395	5,0	2,2	6,7	73,8	8410
120	ASMTO455.11D130A	5,0	2,2	6,8	78,4	9880
150	ASMTO455.11D130B	5,0	2,2	6,9	82,6	11490
185	ASMTO455.11D130C	5,0	2,2	7,0	87,5	13110
240	ASMTO455.11D130D	5,0	2,2	7,2	93,6	15590
			Type 455.22-class1 - 22,22 kV			
16	ASMTO455.22E1316	7,6	2,5	6,6	68,9	5790
25	ASMTO455.22E1325	7,6	2,5	6,6	72,0	6610
35	ASMTO455.22E1335	7,6	2,5	6,7	75,1	7200
50	ASMTO455.22E1350	7,6	2,5	6,8	78,8	8180
70	ASMTO455.22E1370	7,6	2,5	7,0	83,6	9620
95	ASMTO455.22E1395	7,6	2,5	7,1	87,1	10670
120	ASMTO455.22E130A	7,6	2,5	7,2	91,0	12280
150	ASMTO455.22E130B	7,6	2,5	7,3	94,9	13990
185	ASMTO455.22E130C	7,6	2,5	7,4	100,3	15660
			Type 455.33-Class1 - 33,33 kV			
16	ASMTO455.33F1316	10,5	2,5	7,0	84,0	8240
25	ASMTO455.33F1325	10,5	2,5	7,1	86,9	9240
35	ASMTO455.33F1335	10,5	2,5	7,2	90,4	9960
50	ASMTO455.33F1350	10,5	2,5	7,3	93,2	10940
70	ASMTO455.33F1370	10,5	2,5	7,4	97,8	12580
95	ASMTO455.33F1395	10,5	2,5	7,6	101,0	13780
120	ASMTO455.33F130A	10,5	2,5	7,7	106,1	15500
150	ASMTO455.33F130B	10,5	2,5	7,8	110,5	17440

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-IS®- 1,1/1,1 kV

These individually copper screened cables are used for wiring of machines, or between machines and equipment where PVC is suitable.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor:** Stranded copper conductor
- **Insulation:** PVC
- **Individual Composite Screen** (earth conductor)**:** Tinned annealed copper braiding interwove with polyester yarn
- **Binding:** Polyester tape
- **Outer Sheath:** TRATOS OUTER SHEATH®, better than PVC sheath
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE IS + YEAR + SIZE + Metre Mark
- **Core Identification**: white, black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-IS® - 1,1/1,1 kV

N° of Cores × Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Core Screen		Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
			Strand Size mm²	Area Screen mm			
3×1,5	ASMTOISA1301	0,8	0,20	3,5	0,8	10,1	160
4×1,5	ASMTOISA1401	0,8	0,20	4,6	0,8	11,1	210
3×10	ASMTOISA1310	1,0	0,20	6,8	1,0	18,6	590
4×10	ASMTOISA1410	1,0	0,20	9,0	1,0	20,5	750
3×16	ASMTOISA1316	1,0	0,20	7,9	1,3	21,6	840
4×16	ASMTOISA1316	1,0	0,20	10,6	1,3	23,7	1100

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-CS®- 1,1/1,1 kV

These collectively copper screened cables are used for wiring of machines, or between machines and equipment where PVC is suitable.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Stranded copper conductor
- **Insulation**: PVC
- **Bedding**: Polyester tape
- **Collective Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than PVC sheath
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE CS + YEAR + SIZE + Metre Mark
- **Core Identification**: white, black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-CS® - 1,1/1,1 kV

N° of Cores × Cross Sectional Area	Part Number	Thickness of Insulation	Core Screen		Thickness of Outer Sheath	Overall Diameter (approx.)	Weight (approx.)
	TT		Strand Size	Area Screen			
mm²		mm	mm²	mm	mm	mm	kg/km
2×1,5	ASMTOCSA1201	0,8	0,20	2,3	0,8	9,2	120
3×1,5	ASMTOCSA1301	0,8	0,20	2,5	0,8	9,7	150
4×1,5	ASMTOCSA1401	0,8	0,20	2,6	0,8	10,5	180
6×1,5	ASMTOCSA1601	0,8	0,20	3,4	0,8	12,6	250
16×1,5	ASMTOCSA1161	0,8	0,20	5,1	1,0	18,7	550
30×1,5	ASMTOCSA1301	0,8	0,25	8,8	1,3	24,6	960

TRATOS ASNZS MTO®

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-2S-IS®- 1,1/1,1 kV & 3,3/3,3 kV

These individually copper screened cables are used for wiring of machines or between machines and equipment where a rubber cable is desired. These cables are also used for longwall lighting circuits, and may contain pilot and control cores or twisted pair and screened cores.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Stranded copper conductor
- **Insulation**: EPR
- **Filling**: Elastomer centre filler
- **Pilot/Control Cores**: EPR covered and composite screened flexible stranded tinned copper conductor
- **Individual Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty CPE sheath
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE 2S-IS + YEAR + SIZE + Metre Mark
- **Core Identification**: white, black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-2S-IS® - 1,1/1,1 kV & 3,3/3,3 kV

Nº of Cores × Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Core Screen		Pilot Conductor		Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
			Strand Size mm²	Area Screen mm	Nº of Pilots	Thickness of Covering			
Type 2S 1,1/1kV Individually Screened									
3×10	ASMTO2SISA1310	1,2	0,2	7,9	3	–	1,8	22,1	690
4×10	ASMTO2SISA1410	1,2	0,2	7,9	4	–	1,8	23,0	930
2×16	ASMTO2SISA1216	1,2	0,2	9,0	2	–	1,8	22,0	810
3×16	ASMTO2SISA1316	1,2	0,2	9,0	3	–	1,8	23,4	1000
4×16	ASMTO2SISA1416	1,2	0,2	9,0	4	–	1,8	26,8	1350
3×10	ASMTO2SISA1310	1,2	0,2	7,9	3	1,0	1,8	22,5	870
2×16	ASMTO2SISA1216	1,2	0,2	9,0	2	1,0	1,8	22,7	880
3×16	ASMTO2SISA1316	1,2	0,2	9,0	3	1,0	1,8	27,7	1300
3×25	ASMTO2SISA1325	1,4	0,2	11,3	3	1,0	1,8	29,2	1650
3×35	ASMTO2SISA1335	1,4	0,2	12,4	3	1,0	1,8	31,6	2000
3×50	ASMTO2SISA1350	1,6	0,25	17,5	3	1,0	1,9	36,1	2600
Type 2S 1,1/1kV Individually and Collectively Screened									
30×1,5	ASMTO2SISA13001	1,0	0,3	14,0	–	–	1,9	32,6	1700
Type 2S 3,3/3,3Kv Individually Screened									
3×10	ASMTO2SISB1310	3,0	0,2	11,3	3	1,0	1,8	28,9	1300
3×16	ASMTO2SISB1316	3,0	0,2	12,4	3	1,0	1,8	31,3	1600
3×25	ASMTO2SISB1325	3,0	0,2	13,6	3	1,0	1,9	34,8	2100
3×35	ASMTO2SISB1335	3,0	0,2	15,3	3	1,0	2,0	37,8	2500
3×50	ASMTO2SISB1350	3,0	0,2	17,0	3	1,0	2,1	41,3	3050
3×70	ASMTO2SISB1370	3,0	0,3	30,5	3	1,0	2,2	46,8	4150
3×95	ASMTO2SISB1395	3,0	0,3	30,5	3	1,0	2,3	49,6	4900
3×120	ASMTO2SISB130A	3,0	0,4	47,5	3	1,0	2,5	55,0	6200

TRATOS ASNZS MTO®

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-2S-CS®- 1,1/1,1 kV & 3,3/3,3 kV - Collectively Screened

Mainly used for wiring of machines or between machines and equipment where a rubber cable is desired. These cables are also suitable for longwall lighting circuits, and may contain pilot and control cores or twisted pair and screened cores.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Stranded tinned annealed copper conductor
- **Insulation**: EPR
- **Filling**: Elastomer centre filler
- **Bedding**: Polyester tape
- **Composite Screen** (earth conductor): Tinned annealed copper braiding interwove with polyester yarn
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty CPE sheath
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE 2S-CS + YEAR + SIZE + Metre Mark
- **Core Identification**: white, black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-2S-IS® - 1.1/1.1 kV & 3.3/3.3 kV

N° of Cores × Cross Sectional Area	Part Number	Thickness of Insulation	Core Screen		Thickness of Outer Sheath	Overall Diameter (approx.)	Weight (approx.)
	TT		Strand Size	Area Screen			
mm²		mm	mm	mm²	mm	mm	kg/km
2×1,5	ASMTO2SISA1201	1,0	0,20	5,3	1,8	14,7	170
4×1,5	ASMTO2SISA1401	1,0	0,20	12,1	1,8	19,9	260
6×1,5	ASMTO2SISA1601	1,0	0,20	22,6	1,8	25,7	350
16×1,5	ASMTO2SISA1161	1,0	0,25	113,1	1,8	47,1	710
20×1,5	ASMTO2SISA12001	1,0	0,25	159,0	1,8	53,2	820

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-A&B® - 1,1/1,1 kV

These cables are used as 1.1kV cables to distribute power within the mine, suitable for use in underground coal mines. for Type A cables, optional 3 pilots can be selected.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Stranded tinned annealed copper conductor
- **Insulation**: EPR
- **Filling**: Elastomer centre filler
- **Optional Pilot Core** (Type A only): CPE composite insulated and covered pilot conductor
- **Screen** (earth conductor): Copper wire
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than heavy duty CPE sheath
- **Standard colour**: black
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE A&B + YEAR + SIZE + Metre Mark
- **Core Identification**: blue, red and white

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-A&B® - 1.1/1.1 kV

Cross Sectional Area mm²	Part Number TT	Thickness of Insulation mm	Area of Core Screen mm²	Thickness of Pilot Conductor Covering mm	Thickness of Outer Sheath mm	Overall Diameter (approx,) mm	Weight (approx,) kg/km
16	ASMTOABA1316	1,4	6,0	1,6	2,5	24,6	1200
25	ASMTOABA1325	1,4	7,2	1,8	2,5	28,0	1700
35	ASMTOABA1335	1,5	7,9	1,8	2,5	30,4	2050
50	ASMTOABA1350	1,7	9,0	2,0	3,0	34,9	2700
70	ASMTOABA1370	1,8	13,2	2,0	3,3	40,2	3700
95	ASMTOABA1395	2,0	15,1	2,0	3,8	46,1	4900
120	ASMTOABA130A	2,2	22,9	2,0	3,8	51,1	6150
150	ASMTOABA130B	2,3	24,7	2,0	4,4	56,0	7400
185	ASMTOABA130C	2,5	27,5	2,0	5,1	62,3	9150
240	ASMTOABA130D	2,7	64,4	2,0	5,7	72,9	12900

TRATOS ASNZS MTO®

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-XLPE®- 6,35/11 kV & 12,7/22kV - XLPE Insulated

Mainly used as HV feeder cables in fixed conditions.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Stranded plain copper conductor
- **Insulation**: XLPE
- **Individual Screen** (earth conductor): Copper wire
- **Inner Sheath**: PVC sheath
- **Armour**: Galvanized steel wire armour
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than PVC sheath to AS/NZS 1429.1
- **Standard colour**: Red
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE XLPE + YEAR + SIZE + Metre Mark
- **Core Identification**: black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-XLPE® - 6,35/11 kV & 12,7/22 kV

Cross Sectional Area mm²	Part Number TT	Nominal Conductor Area mm	Thickness of Insulation mm	Area of Core Screen mm²	Armour Wire Diameter mm	Thickness of Outer Sheath mm	Overall Diameter (approx.) mm	Weight (approx.) kg/km
				6,35/11kV				
16	ASMTOXLPEC1316	4,8	3,4	5,7	2,00	2,4	46,6	3300
25	ASMTOXLPEC1325	5,8	3,4	5,7	2,50	2,5	50,1	4150
35	ASMTOXLPEC1335	6,8	3,4	6,2	2,50	2,6	52,8	4750
50	ASMTOXLPEC1350	8,0	3,4	8,5	2,50	2,7	55,7	5400
70	ASMTOXLPEC1370	9,6	3,4	11,9	2,50	2,8	59,6	6450
95	ASMTOXLPEC1395	11,5	3,4	16,5	2,50	2,9	63,9	7750
120	ASMTOXLPEC130A	13,1	3,4	20,4	2,50	3,1	67,9	9050
150	ASMTOXLPEC130B	14,5	3,4	25,0	2,50	3,2	71,5	10300
185	ASMTOXLPEC130C	16,1	3,4	31,5	3,15	3,3	78,6	12800
240	ASMTOXLPEC130D	18,5	3,4	41,5	3,15	3,5	84,7	15500
300	ASMTOXLPEC130E	20,7	3,4	53,0	3,15	3,7	90,4	18200
400	ASMTOXLPEC130F	23,6	3,4	67,3	3,15	4,0	97,9	22300
				12,7/22kV				
35	ASMTOXLPED1335	6,8	5,5	7,9	2,5	2,9	63,2	6000
50	ASMTOXLPED1350	8,0	5,5	8,5	2,5	3,0	66,0	6650
70	ASMTOXLPED1370	9,6	5,5	11,9	2,5	3,1	69,9	7750
95	ASMTOXLPED1395	11,5	5,5	16,5	2,5	3,3	74,4	9200
120	ASMTOXLPED130A	13,1	5,5	20,4	3,15	3,4	79,5	11400
150	ASMTOXLPED130B	14,5	5,5	25,0	3,15	3,5	83,1	12800
185	ASMTOXLPED130C	16,1	5,5	31,5	3,15	3,7	89,1	14500
240	ASMTOXLPED130D	18,5	5,5	41,5	3,15	3,9	95,0	17200
300	ASMTOXLPED130E	20,7	5,5	53,0	3,15	4,1	101,1	20100
400	ASMTOXLPED130F	23,6	5,5	67,3	3,15	4,3	108,2	24200

TRATOS ASNZS MTO®

MINING CABLES BASED ON AS/NZS 1972:2006

TRATOS ASNZS MTO-PAPER®- 11/11 kV - Paper Insulated

Mainly used as HV feeder cables in fixed conditions.

FEATURES AND PERFORMANCES

CONSTRUCTION

- **Conductor**: Sector shaped stranded copper conductor
- **Insulation**: Paper tape
- **Filling**: Jute fillers
- **Insulation**: Paper tape belt insulation
- **Inner Sheath**: Lead sheath
- **Bedding**: PVC sheath
- **Armour**: Galvanized steel wire armour
- **Outer Sheath**: TRATOS OUTER SHEATH®, better than PVC sheath to AS/NZS 1026
- **Standard colour**: Red
- **Marking**: TRATOS + XR-EP-90/XHD-85-PCP + TYPE PAPER + YEAR + SIZE + Metre Mark
- **Core Identification**: black and numbered

STANDARDS

- AS/NZS 1972:2006
- AS/NZS 1125
- AS/NZS 3808

TRATOS ASNZS MTO-PAPER® - 11/11 kV

Nominal Cross Sectional Area	Part Number	Minimum Insulation Thickness		Nominal Thickness of Lead Sheath	Armour Wire Diameter	Thickness of Outer Sheath	Overall Diameter (approx.)	Weight (approx.)
	TT	Between Conductors	Between Conductors & Lead Sheath					
mm²		mm	mm	mm²	mm	mm	mm	kg/km
25	ASMTOPAPERD1325	5,6	5,4	1,8	2,5	2,4	47,9	6300
35	ASMTOPAPERD1335	5,6	5,4	1,8	2,5	2,5	50,3	6950
50	ASMTOPAPERD1350	5,6	5,4	1,8	2,5	2,5	50,1	7250
70	ASMTOPAPERD1370	5,6	5,4	1,9	2,5	2,6	53,5	8550
95	ASMTOPAPERD1395	5,6	5,4	2,0	2,5	2,6	57,2	10000
120	ASMTOPAPERD130A	5,6	5,4	2,0	2,5	2,7	60,1	11200
150	ASMTOPAPERD130B	5,6	5,4	2,1	2,5	2,8	63,0	12600
185	ASMTOPAPERD130C	5,6	5,4	2,3	3,15	2,9	68,0	15400
240	ASMTOPAPERD130D	5,6	5,4	2,4	3,15	3,0	73,1	18200
300	ASMTOPAPERD130E	5,6	5,4	2,6	3,15	3,2	77,9	21200
400	ASMTOPAPERD130F	5,6	5,4	2,7	3,15	3,4	83,5	25000

TRATOS MTO®

based on AS/NZS, VDE, BS, UL, CSA, MSHA, OSHA

*Specifically customized for the mining market; TRATOS MTO® is designed to **resist sunlight**, **water**, **extreme temperature**, chemical, oil and **abrasion**, while also performing **consistently** in tough drilling environments. The voltage range for TRATOS MTO® is between **600V** and **35KV**.*

Cables for a moving world

TRATOS®

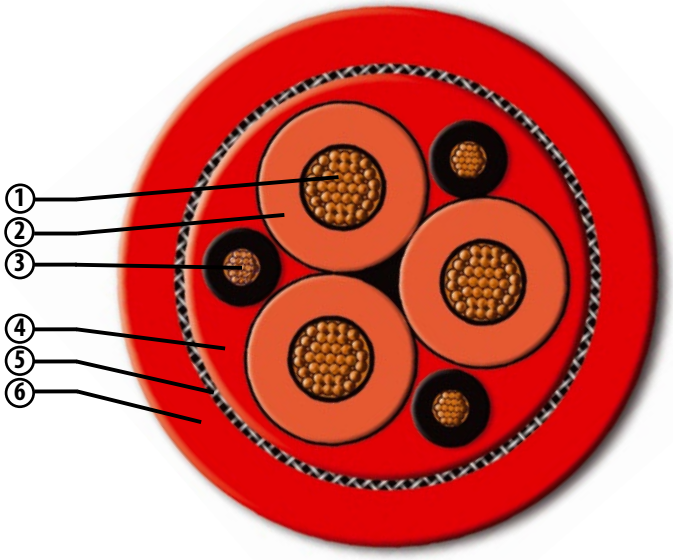
TRATOS ASNZS MTO®

MEDIUM VOLTAGE POWER CABLES - (N) TSCGEWÖU VDE 0250 p.813 (as applicable) & HD 620 S1 p.9

TRATOSFLEX-ESDB® - High speed, high pull & torsion resistance

High speed, high pull & torsion resistance for **reeling one and two ways application**.

FEATURES AND PERFORMANCES



CONSTRUCTION

1) Conductor more flexible than Cl. 5 VDE 0295
2) Semiconducting layer + Insulation Tratosflex-ESDB-I®, equivalent to or better than HEPR + Semiconducting layer*
3) Ground conductor with semiconducting layer
4) Inner sheath red colour elastomeric compound Tratosflex-ESDB-IS®
5) Antitorsional protection
6) Outer sheath red colour elastomeric compound Tratosflex-ESDB-OS®, better than 5GM5 quality

TECHNICAL SPECIFICATIONS

• Rated Voltage	3,6/6 kV	6/10 kV	8,7/15 kV	12/20 kV
• Max Voltage AC	4,2/7,2 kV	6,9/12 kV	10,4/18 kV	13,9/24 kV
• AC Voltage Test	11 kV	17 kV	24 kV	29 kV

Working Ambient Temperature:	
Fixed installation	-40 °C to +80 °C
In operation	-20°C to +60 °C

Travel Condition:					
Main application	Monospiral Reel One Way	Monospiral Reel Two Ways	Random	Spreader Reel	-
Suitable m/min Max	-	-	-	-	Tender System
Operating max speed (mt/min)	**300**	**200**	60	200	60

***Very special semiconducting compound which acts as a screen: the resistance between the ground conductor and semiconductive external layer of phase conductor must be maximum 500 Ohm measured according to VDE 0472 part 512**

TRATOSFLEX-ESDB - High speed, high pull & torsion resistance

Part Number	Nominal Cross Section mm²	Nominal Conductor Diameter mm	Maximum Conductor DC Resistance at 20 °C Ω/Km	Maximum Permanent Tensile Load N	Maximum Dynamical Tensile Load During Acceleration Processt N	Minimum Overall Diameter mm	Maximum Overall Diameter mm	Nominal Cable Weight Kg/m
3,6/6 kV (N)TSCGEWÖU								
FDC325	3x25+3x10	6,5/4,2	0,795/0,795*	3000	**4125**	42,5	45,5	2,560
FDC335	3x35+3x10	7,8/4,2	0,565/0,795*	3000	**4125**	44,2	47,2	3,050
FDC350	3x50+3x10	9,5/4,2	0,393/0,795*	3600	**5250**	47,3	50,2	3,520
FDC370	3x70+3x16	11,4/5,4	0,277/0,565*	5000	**7500**	50,0	54,2	4,950
FDC395	3x95+3x16	13,0/5,4	0,210/0,393*	6500	**8900**	55,4	59,4	5,780
FDC30A	3x120+3x25	14,7/6,5	0,164/0,277*	7500	**10800**	60,6	64,6	6,800
FDC30B	3x150+3x25	16,5/6,5	0,132/0,277*	9000	**12000**	64,0	67,0	8,200
		(1) (2)	(1) (2)					
6/10 kV (N)TSCGEWÖU								
FDD325	3x25+3x10	6,5/4,2	0,795/0,795*	3000	**4125**	42,5	45,5	2,560
FDD335	3x35+3x10	7,8/4,2	0,565/0,795*	3000	**4125**	44,2	47,2	3,050
FDD350	3x50+3x10	9,5/4,2	0,393/0,795*	3600	**5250**	47,3	50,2	3,520
FDD370	3x70+3x16	11,4/5,4	0,277/0,565*	5000	**7500**	50,0	54,2	4,700
FDD395	3x95+3x16	13,0/5,4	0,210/0,393*	6500	**8900**	55,4	59,4	5,880
FDD30A	3x120+3x25	14,7/6,5	0,164/0,277*	7500	**10800**	60,6	64,6	6,950
FDD30B	3x150+3x25	16,5/6,5	0,132/0,277*	9000	**12000**	64,0	67,0	8,200
8,7/15 kV (N)TSCGEWÖU								
FDE325	3x25+3x10	6,5/4,2	0,795/0,795*	3000	**4125**	43,5	47,0	2,750
FDE335	3x35+3x10	7,8/4,2	0,565/0,795*	3000	**4125**	47,1	50,1	3,250
FDE350	3x50+3x10	9,5/4,2	0,393/0,795*	3600	**5250**	50,0	54,0	3,890
FDE370	3x70+3x16	11,4/5,4	0,277/0,565*	5000	**7500**	54,0	58,0	5,100
FDE395	3x95+3x16	13,0/5,4	0,210/0,393*	6500	**8900**	59,1	63,1	6,270
FDE30A	3x120+3x25	14,7/6,5	0,164/0,277*	7500	**10800**	64,5	68,5	7,700
FDE30B	3x150+3x25	16,5/6,5	0,132/0,277*	9000	**12000**	69,5	73,5	8,600
12/20 kV (N)TSCGEWÖU								
FDF325	3x25+3x10	6,5/4,2	0,795/0,795*	3000	**4125**	48,0	51,0	3,060
FDF335	3x35+3x10	7,8/4,2	0,565/0,795*	3000	**4125**	50,2	54,2	3,590
FDF350	3x50+3x10	9,5/4,2	0,393/0,795*	3600	**5250**	55,4	59,4	4,470
FDF370	3x70+3x16	11,4/5,4	0,277/0,565*	5000	**7500**	59,0	63,0	5,490
FDF395	3x95+3x16	13,0/5,4	0,210/0,393*	6500	**8900**	63,6	67,6	6,900
FDF30A	3x120+3x25	14,7/6,5	0,164/0,277*	7500	**10800**	68,4	72,4	8,150
FDFE30B	3x150+3x25	16,5/6,5	0,132/0,277*	9000	**12000**	73,0	77,0	9,150

(1) = Phase conductor

(2) = Protective conductors

* Value of three conductors in parallel connection

Special dimensions produced upon request

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