

Metric Cables (Pty) Ltd

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MINE REELING CABLE

R-(N)TSCGEWTOEUS

APPLICATIONS

Flexible reeling cable for power supply to machines with high and extreme mechanical stress, eg tensional stress and high reeling speeds:

- Open-cast and underground mining
- Ship to Shore Cranes (STS)
- Ship Unloader, Stacker, Reclaimer and other heavy duty mobile equipment.

Six cores: Three phase cores
 Two Pilots and one protective earth core.

Standards: DIN VDE 0250 part 813; DIN VDE 0295; DIN VDE 0298; DIN VDE 0472;
 prEN 50363

CABLE DESCRIPTION

- Conductor
Flexible, plain copper, "FSC" better than IEC 60228 class 5.
- Insulation
 - *Inner semi-conductive layer.*
 - *New special insulation compound EPDM, better than DIN VDE 207 part 20.*
 - *Outer semi-conductive layer, easy strip design.*
- Protective earth conductor
Flexible, plain copper "FSC" better than IEC 60228 class 5.
- Ground check conductor (Pilot core).
- Inner sheath special synthetic rubber, better than GM1b
- Reinforcement
Synthetic threads with very high tensile strength as a protection against twist stress and pressure loads.
- Outer Sheath
New special sandwich construction for optimum flexibility, abrasion resistance and heavy load special rubber compound. Colour – red.

PROPERTIES

Mechanical properties:

Tensile strength of the conductor

- Static 1.5 N/mm²
- Dynamic 30 N/mm²

Bending radius: exceeds the DIN VDE298 standards in tests performed on alternated bending/reversed bending/twisting/torsional resistance.

Reeling speed: up to and exceeding 190m/min.

Chemical properties

- Oil resistant
- UV and ozone resistant
- Flame-retardant and according to IEC 60 332 part 1.

Electrical and thermal properties

Excellent EMC compatibility due to 6 core design

Nominal voltage:

U₀/U 1.8KV in AC

Maximum operating voltage in AC systems:

U_m 1.2 x U

Maximum operating voltage in DC systems:

V_m 1.8 x U

Test voltage:

11 to 45 KV in AC

27.5 to 107.5 KV in DC

Max. temperature at conductor

In service

+ 90⁰C

Under short-circuit conditions

+ 250⁰C

Max. surface temperature

Fixed installation

- 50⁰C and up to + 80⁰C

Mobile operations

- 35⁰C and up to + 80⁰C

BENEFITS OF METRIC CABLES

Vulcanised with the same compounds used to manufacture the cable:

- Restoring the conductive capabilities
- Maintaining the same high level of tensile strength; bending radius; torsion characteristics; maximum temperatures
- The cable remains oil resistant; UV and ozone resistant; flame-retardant.
- The original diameter is maintained which is particularly important for high speed reeling.
- Reduction in cable and power failures.

ELECTRICAL DATA

| Current carrying capacity in ampere [A] at 30°C ambient temperature (acc. DIN VDE 0298-4) on ground: | | |
|---|----------------|---------------|
| Cross-section (mm ²) | Up to 10kV [A] | Over 10kV [A] |
| 25 | 131 | 139 |
| 35 | 162 | 172 |
| 50 | 202 | 216 |
| 70 | 250 | 265 |
| 95 | 301 | 319 |
| 120 | 352 | 371 |
| 150 | 404 | 428 |
| 185 | 461 | 488 |
| 240 | 553 | 587 |

SHORT CIRCUIT CURRENT

| (80 – 250°C / I _{thr} = 149 A/mm ²) in kA I _{thz} = I _{thr} •√t _{kr} /t _k | | |
|---|----------------------------|-----------------------------|
| Cross-section (mm ²) | for 1 s (t _{kr}) | for 0.5 s (t _k) |
| 25 | 3.7 | 5.3 |
| 35 | 5.2 | 7.4 |
| 50 | 7.5 | 10.5 |
| 70 | 10.4 | 14.8 |
| 95 | 14.2 | 20.0 |
| 120 | 17.9 | 25.3 |
| 150 | 22.4 | 31.6 |
| 185 | 27.6 | 39.0 |
| 240 | 35.8 | 50.6 |

BENDING RADII

Smallest permissible bending radius:

- Fixed installation 6 x outer-Ø
- Reeling application 12 x outer- Ø
- Deflection pulleys 15 x outer- Ø
- Min. distance with S-type directional changes 20 x outer- Ø

Thermal Properties

Permissible temperature on cable surface:

- Static -50°C/+80°C
- Flexing -35°C/+80°C

Max. conductor temperature 90°C

Max. short-circuit temperature of conductor 250°C

Correction factor for ambient temperatures other than 30°C to be applied to the current-carrying capacities for cables in the air acc. DIN VDE 0298-4 (permissible conductor temperature 90°C):

| | | | | | | |
|------|------|------|------|------|------|------|
| 10°C | 20°C | 30°C | 40°C | 50°C | 60°C | 70°C |
| 1.15 | 1.08 | 1.00 | 0.91 | 0.82 | 0.71 | 0.58 |

CORRECTION FACTOR FOR REELED FLEXIBLE CABLES

| | | | | | |
|-----------------|------|------|------|------|------|
| No of layers | 1 | 2 | 3 | 4 | 5 |
| Factor | 0.80 | 0.61 | 0.49 | 0.42 | .038 |
| Monospiral reel | 0.80 | | | | |

DIN VDE 0298-4: Application of cables and cords in power installations:

Part 4: recommended current-carrying capacity for sheathed and non-sheathed cables for fixed wirings in and around buildings and for flexible cables and cords.