

50 V Underground Longwall Mining Signal & Control Cable (TPU)

50 V Underground Longwall Mining Signal Cable is designed for intrinsically safe and low-voltage control, telemetry, methane/airflow monitoring, electrohydraulic roof-support shield interconnects, conveyor pull-cord lockout switches, and voice/audio paging lines along underground longwall faces and gate roads. Chemically cross-linked, non-chlorinated flame-retardant polyolefin core insulation prevents conductor pinch-through under falling coal/rock, while the extra-tough thermoplastic polyurethane (TPU) jacket outlasts conventional PVC or rubber control cables by 3× to 5× in abrasive pan-line service.

1. CABLE CONSTRUCTION

1. Signal Conductors (2–9×)	Extra-flexible bunch-stranded annealed copper conductors manufactured to ASTM B-174 in 18 AWG, 16 AWG, 14 AWG, 12 AWG, and 10 AWG.
2. XL-FR Polyolefin Insulation	Chemically cross-linked, non-chlorinated thermosetting flame-retardant polyolefin (+90°C rated) offering high cut-through resistance and crisp color coding.
3. Round Cabled Core & Wrap	2 to 9 insulated conductors concentrically cabled into a round profile with non-wicking fillers (where required) and a smooth core separator binder tape.
4. Optional Copper Braid Shield	Full flexible copper wire braid shield available upon request for high-EMI longwall pan-line troughs and shearer proximity zones.
5. Extra-Tough TPU Outer Jacket	Abrasion-, tear-, oil-, and water-resistant Thermoplastic Polyurethane (TPU) jacket in standard Black or high-visibility Safety Orange (±5% OD tolerance).

Cross-Section Reference



50V Longwall Signal Cable cross-section (7-conductor example): ASTM B-174 flexible copper cores, cross-linked FR polyolefin insulation, binder wrap (optional full Cu braid), and extra-tough TPU sheath.

2. ELECTRICAL & MECHANICAL CHARACTERISTICS

Rated Voltage	50 V AC / DC underground mining signal, telemetry, and control circuits
Conductor Counts & Sizes	2, 3, 4, 5, 6, 7, 8, or 9 conductors across 18 AWG, 16 AWG, 14 AWG, 12 AWG, and 10 AWG
Temperature Rating	+90°C maximum continuous conductor operating temperature
Conductor Standard	ASTM B-174 extra-flexible bunch-stranded copper
Shielding & Jacket Options	Unshielded standard or full copper braid on request Black TPU standard; Orange TPU optional
Outside Diameter Tolerance	±5% of nominal overall cable diameter

3. DIMENSIONAL, GROUNDING & AMPACITY SPECIFICATIONS

Table 1: 18 AWG (0.82 mm²) & 16 AWG (1.31 mm²) — 50 V Longwall Signal Cable (2 to 9 Conductors)					
Construction	Core Area (mm²)	Conductors	Insulated Core OD (in / mm)	Nominal Cable OD (in / mm)	Approx. Weight (lb/kft / kg/km)
2 × 18 AWG	0.82	2	0.115 / 2.9	0.440 / 11.2	87 / 129
3 × 18 AWG	0.82	3	0.115 / 2.9	0.460 / 11.7	100 / 149
4 × 18 AWG	0.82	4	0.115 / 2.9	0.490 / 12.4	117 / 174
5 × 18 AWG	0.82	5	0.115 / 2.9	0.520 / 13.2	136 / 202
6 × 18 AWG	0.82	6	0.115 / 2.9	0.560 / 14.2	156 / 232
7 × 18 AWG	0.82	7	0.115 / 2.9	0.560 / 14.2	163 / 243
8 × 18 AWG	0.82	8	0.115 / 2.9	0.630 / 16.0	197 / 293
9 × 18 AWG	0.82	9	0.115 / 2.9	0.660 / 16.8	215 / 320
2 × 16 AWG	1.31	2	0.125 / 3.2	0.460 / 11.7	99 / 147
3 × 16 AWG	1.31	3	0.125 / 3.2	0.480 / 12.2	114 / 170
4 × 16 AWG	1.31	4	0.125 / 3.2	0.510 / 13.0	133 / 198
5 × 16 AWG	1.31	5	0.125 / 3.2	0.550 / 14.0	158 / 235
6 × 16 AWG	1.31	6	0.125 / 3.2	0.590 / 15.0	183 / 272
7 × 16 AWG	1.31	7	0.125 / 3.2	0.590 / 15.0	190 / 283
8 × 16 AWG	1.31	8	0.125 / 3.2	0.660 / 16.8	225 / 335
9 × 16 AWG	1.31	9	0.125 / 3.2	0.690 / 17.5	247 / 368

Table 2: 14 AWG (2.08 mm²) & 12 AWG (3.31 mm²) — 50 V Longwall Signal Cable (2 to 9 Conductors)

Construction	Core Area (mm²)	Conductors	Insulated Core OD (in / mm)	Nominal Cable OD (in / mm)	Approx. Weight (lb/kft / kg/km)
2 × 14 AWG	2.08	2	0.140 / 3.6	0.490 / 12.4	118 / 176
3 × 14 AWG	2.08	3	0.140 / 3.6	0.510 / 13.0	138 / 205
4 × 14 AWG	2.08	4	0.140 / 3.6	0.550 / 14.0	166 / 247
5 × 14 AWG	2.08	5	0.140 / 3.6	0.590 / 15.0	196 / 292
6 × 14 AWG	2.08	6	0.140 / 3.6	0.630 / 16.0	225 / 335
7 × 14 AWG	2.08	7	0.140 / 3.6	0.630 / 16.0	238 / 354
8 × 14 AWG	2.08	8	0.140 / 3.6	0.710 / 18.0	278 / 414
9 × 14 AWG	2.08	9	0.140 / 3.6	0.750 / 19.0	300 / 446
2 × 12 AWG	3.31	2	0.160 / 4.1	0.526 / 13.4	148 / 220
3 × 12 AWG	3.31	3	0.160 / 4.1	0.555 / 14.1	177 / 263
4 × 12 AWG	3.31	4	0.160 / 4.1	0.596 / 15.1	213 / 317
5 × 12 AWG	3.31	5	0.160 / 4.1	0.642 / 16.3	254 / 378
6 × 12 AWG	3.31	6	0.160 / 4.1	0.690 / 17.5	297 / 442
7 × 12 AWG	3.31	7	0.160 / 4.1	0.690 / 17.5	316 / 470
8 × 12 AWG	3.31	8	0.160 / 4.1	0.770 / 19.6	388 / 577
9 × 12 AWG	3.31	9	0.160 / 4.1	0.815 / 20.7	426 / 634

Table 3: 10 AWG (5.26 mm²) Heavy Valve & Solenoid Bus Series — 50 V Longwall Signal Cable (2 to 9 Conductors)

Construction	Core Area (mm²)	Conductors	Insulated Core OD (in / mm)	Nominal Cable OD (in / mm)	Approx. Weight (lb/kft / kg/km)
2 × 10 AWG	5.26	2	0.180 / 4.6	0.570 / 14.5	186 / 277
3 × 10 AWG	5.26	3	0.180 / 4.6	0.598 / 15.2	226 / 336
4 × 10 AWG	5.26	4	0.180 / 4.6	0.645 / 16.4	276 / 411
5 × 10 AWG	5.26	5	0.180 / 4.6	0.696 / 17.7	331 / 493
6 × 10 AWG	5.26	6	0.180 / 4.6	0.750 / 19.0	391 / 582
7 × 10 AWG	5.26	7	0.180 / 4.6	0.750 / 19.0	462 / 688
8 × 10 AWG	5.26	8	0.180 / 4.6	0.835 / 21.2	519 / 772
9 × 10 AWG	5.26	9	0.180 / 4.6	0.875 / 22.2	626 / 932

Dimensional & Braid Note: Listed outside diameters and weights apply to unshielded TPU builds (±5% OD tolerance; 1 lb/ft = 1,000 lb/kft = 1,488.16 kg/km). When ordered with optional full copper braid shielding, nominal OD increases by approximately 0.030–0.050 in (0.8–1.3 mm).