

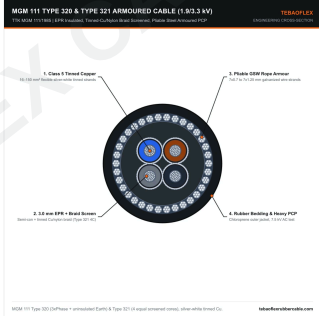
MGM 111 Type 320 (3+1C) & Type 321 (4C) Pliable Armoured Mining Cable (1900/3300V)

MGM 111 Type 320 and Type 321 are 1900/3300 V pliable-armoured elastomeric mining cables engineered to Turkish TTK MGM 111/1985, combining Class 5 tinned copper conductors, 3.0 mm EPR insulation, copper/nylon braided core screens, and stranded galvanized steel armour for semi-mobile coal-face feeders.

1. CABLE CONSTRUCTION

1. Conductor	Electrolytic flexible stranded tinned copper wire per IEC 60228 Class 5 (0.40 mm wires on 16–50 mm²; 0.50 mm wires on 70–150 mm²).
2. Semiconductive & EPR Insulation	3.0 mm nominal Ethylene Propylene Rubber (EPR) insulation wall with semiconducting stress-control layers on all insulated cores (3 phase cores in Type 320; all 4 cores in Type 321).
3. Core Metallic Screen & Earth	Flexible composite braid of tinned copper wires and nylon yarns applied over each insulated core. Type 320 includes one uninsulated Class 5 tinned copper earth core in direct contact with the phase screens.
4. Elastomeric Inner Sheath	Extruded heavy rubber inner bedding (2.5 mm to 5.0 mm radial thickness) encapsulating the cabled core assembly.
5. Pliable Steel Rope Armour	Helical armour of 7-wire galvanized steel pliable strands (7/0.70 mm, 7/0.90 mm, or 7/1.25 mm) combining high crush strength with repeatable bending flexibility.
6. Outer Sheath	Heavy-duty black chloroprene rubber (PCP) jacket (4.0 mm to 7.6 mm radial wall), flame retardant, oil resistant, and tear resistant.

Cross-Section Anatomy



MGM 111 Type 321 Cross-Section (4-Core Screened Shown): Class 5 tinned copper conductors, 3.0 mm EPR insulation, semiconductive layers + tinned copper/nylon composite braid screens, rubber bedding, pliable 7-wire GSW rope armour, and heavy-duty PCP sheath.

2. ELECTRICAL, MECHANICAL & STANDARD DATA

Reference Standard	Turkish Hard Coal Enterprises TTK MGM 111/1985 & IEC 60228 Class 5
Rated Voltage (Uo/U)	1900 / 3300 V (1.9/3.3 kV AC Three-Phase Mining Systems)
Routine Dielectric Test	7500 V (7.5 kV) AC
Size Range	Type 320: 3x16+16 to 3x120+70 mm² Type 321: 4x16 to 4x150 mm²
EPR Insulation Thickness	3.0 mm nominal radial thickness across all cross-sections
Current Rating Basis	85 A (16 mm²) up to 345 A (150 mm²) continuous at 25°C ambient
Minimum Bending Radius	9 x maximum overall cable diameter (503 mm to 894 mm)
Earth-Fault Path Impedance	Low-resistance tinned Cu/nylon screen + earth core (0.70–0.18 Ω/km on Type 320) + pliable GSW armour (1.40–0.38 Ω/km)

TEBAOFLEX CABLE

3. DIMENSIONAL, ARMOUR & ELECTRICAL SPECIFICATIONS

1. MGM 111 Type 320 (1900/3300V) — 3 Screened Phase Cores + 1 Uninsulated Earth Core (3x16+16 to 3x120+70 mm²)

Cable Size	Phase Strand (n/mm)	Earth Size & Strand	Inner Sheath (mm)	Pliable Armour	Outer Sheath (mm)	Min. OD (mm)	Max. OD (mm)	Min. Bend (mm)	Current 25°C (A)	Phase R (Ω/km)	3 Scr.+Earth R	Armour R (Ω/km)	Cu Wt. (kg/km)	Cable Wt. (kg/km)
3x16+16	126/0.40	1x16 (126/0.40)	2.5	7 / 0.70	4.0	51.5	55.8	503	85	1.24	0.70	1.40	990	4700
3x25+16	196/0.40	1x16 (126/0.40)	2.5	7 / 0.70	5.0	56.7	60.1	541	110	0.795	0.60	0.96	1300	6150
3x35+16	276/0.40	1x16 (126/0.40)	3.5	7 / 0.90	5.3	60.7	64.1	577	135	0.565	0.50	0.90	1650	7300
3x50+25	396/0.40	1x25 (196/0.40)	3.8	7 / 0.90	5.8	68.6	72.3	651	170	0.393	0.50	0.79	2250	9100
3x70+35	360/0.50	1x35 (276/0.40)	3.8	7 / 0.90	6.7	74.7	78.4	706	205	0.277	0.34	0.73	3150	11000
3x95+50	475/0.50	1x50 (396/0.40)	5.0	7 / 1.25	6.8	85.3	89.2	803	250	0.210	0.28	0.47	4200	11800
3x120+70	608/0.50	1x70 (360/0.50)	5.0	7 / 1.25	7.2	88.5	93.7	844	295	0.164	0.18	0.44	5050	16700

2. MGM 111 Type 321 (1900/3300V) — 4 Equal Individually Screened EPR Cores (4x16 to 4x150 mm²)

Cable Size	Cond. Strand (n/mm)	EPR Wall (mm)	Inner Sheath (mm)	Pliable Armour	Outer Sheath (mm)	Min. OD (mm)	Max. OD (mm)	Min. Bend (mm)	Current 25°C (A)	Cond. R (Ω/km)	Armour R (Ω/km)	Cu Wt. (kg/km)	Cable Wt. (kg/km)
4x16	126/0.40	3.0	2.5	7 / 0.70	4.0	51.5	55.8	503	85	1.24	1.40	1100	4850
4x25	196/0.40	3.0	2.5	7 / 0.70	5.0	56.7	60.1	541	110	0.795	0.96	1500	6400
4x35	276/0.40	3.0	3.5	7 / 0.90	5.3	60.7	64.1	577	135	0.565	0.90	2000	7650
4x50	396/0.40	3.0	3.8	7 / 0.90	5.8	68.6	72.3	651	170	0.393	0.79	2650	9500
4x70	360/0.50	3.0	3.8	7 / 0.90	6.7	74.7	78.4	706	205	0.277	0.73	3700	11550
4x95	475/0.50	3.0	5.0	7 / 1.25	6.8	85.3	89.2	803	250	0.210	0.47	4900	12500
4x120	608/0.50	3.0	5.0	7 / 1.25	7.2	88.5	93.7	844	295	0.164	0.44	5800	17450
4x150	756/0.50	3.0	5.0	7 / 1.25	7.6	95.4	99.3	894	345	0.124	0.38	6850	19000

Pliable Armour Construction: Unlike solid single-wire SWA/DWA, 7/0. 70, 7/0. 90, and 7/1. 25 denote 7-wire stranded galvanized steel ropes laid helically over the rubber inner sheath.