






Halogen-free, thermoplastic, flame retardant sheathing compound for low and medium voltage cables

■ Compound class Sheathing		■ Compound category TP		■ Flame retardant ATH
■ Standards				
VDE 0207 part 24	HM 2, HM 4	DIN EN 50363-8	TM7	
BS 7655 section 6.1	LTS 1 - LTS 4	DIN VDE 0276-604	HM4	
NF C 32-323		DIN VDE 0281 part 14	TM7	
CEI 20-11 M1		VDE 0250 part 215	HM5	
IEC 60092-360	SHF 1			
■ Operating temperature [C°] -15 to 90		■ Oil resistance level ★★★★★		
■ Typical applications <i>Flame retardant halogen free and low smoke, oil resistant, ozone resistant, max. operating temperature 90°C.</i>				
				
Rolling Stock, Rapid Transit, Railways				
■ Features				
 Flame retardant		 Halogen-free		 Low smoke
 Oil resistant				

PHYSICAL PROPERTIES

■ Physical properties	Unit	Typical value	Test method
Density*	g/cm ³	1,52	DIN EN ISO 1183-1A
Hardness*	Shore D	57	DIN ISO 7619-1
MFI (150°C; 21,6 kg)	g/10min	3,5	DIN EN ISO 1133
Abrasion*	mm ³	255	DIN VDE 0472-605

MECHANICAL PROPERTIES**

■ Thermoplastic	Unit	Typical value	Test method
Tensile strength	N/mm ²	10	IEC 60811-501
Elongation at break	%	180	IEC 60811-501
Tear resistance	N/mm	16	DIN 53 507
Elongation at break at -15°C	%	130	IEC 60811-501
Elongation at break at -30°C	%	115	IEC 60811-501
Cold bend at -30°C		no cracks	IEC 60811-504
Cold impact at -15°C		no cracks	IEC 60811-506
Brittleness point	°C	-29	ASTM D 746-64T
Torsional oscilation	°C	-26	DIN 53445
■ After ageing in air oven 240h at 120°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	12,1	IEC 60811-401
Variation in tensile strength	%	+21,0	IEC 60811-401
Elongation at break	%	175	IEC 60811-401
Variation in elongation at break	%	-2,8	IEC 60811-401

THERMAL PROPERTIES *

■ Heat tests	Unit	Typical value	Test method
Hot pressure test: penetration 6h at 90°C	%	1,5	IEC 60811-508
Hot pressure test: penetration 6h at 100°C	%	3	IEC 60811-508
Heat shock 1h at 150°C		no cracks	IEC 60811-509
Shrinkage 1h at 100°C	%	0,5	IEC 60811-509

Electrical properties

■ Heat tests	Unit	Typical value	Test method
Volume resistivity at 16h / 20°C / 500V	Ω cm	1,2 x 10¹³	DIN VDE 0303-30
Volume resistivity at 2h / 90°C / 10V	Ω cm	6,1 x 10⁸	DIN VDE 0303-30
Surface resistivity at 16h / 20°C / 500V	Ω	6,7 x 10¹²	DIN VDE 0303-31
Surface resistivity at 2h / 90°C / 10V	Ω	3,6 x 10⁸	DIN VDE 0303-31

RESISTANCE **

■ Fluid IRM 902 24h at 100°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	9,2	IEC 60811-404
Variation in tensile strength	%	-8,0	IEC 60811-404
Elongation at break	%	190	IEC 60811-404
Variation in elongation at break	%	+5,5	IEC 60811-404
Absorption	%	+12,9	IEC 60811-404
■ Fluid IRM 902 96h at 100°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	10,1	IEC 60811-404
Variation in tensile strength	%	+1,0	IEC 60811-404
Elongation at break	%	201	IEC 60811-404
Variation in elongation at break	%	+11,7	IEC 60811-404
Absorption	%	+19,3	IEC 60811-404
■ Fluid IRM 902 168h at 100°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	8,3	IEC 60811-404
Variation in tensile strength	%	-17,0	IEC 60811-404
Elongation at break	%	195	IEC 60811-404
Variation in elongation at break	%	+8,3	IEC 60811-404
Absorption	%	+19,4	IEC 60811-404
■ Fluid IRM 903 24h at 100°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	8,2	IEC 60811-404
Variation in tensile strength	%	-18,0	IEC 60811-404
Elongation at break	%	200	IEC 60811-404
Variation in elongation at break	%	+11,1	IEC 60811-404
Absorption	%	+24,6	IEC 60811-404
■ Fluid IRM 903 168h at 100°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	7,7	IEC 60811-404
Variation in tensile strength	%	-13,0	IEC 60811-404
Elongation at break	%	141	IEC 60811-404
Variation in elongation at break	%	-21,7	IEC 60811-404
■ Diesel Oil 168h at 70°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	8,3	IEC 60811-404
Variation in tensile strength	%	-17,0	IEC 60811-404
Elongation at break	%	142	IEC 60811-404
Variation in elongation at break	%	-21,1	IEC 60811-404
Absorption	%	+13,0	IEC 60811-404
■ Dot 4 acc. TL 6850-0017 168h at 70°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	8,8	IEC 60811-404
Variation in tensile strength	%	-12,0	IEC 60811-404
Elongation at break	%	121	IEC 60811-404
Variation in elongation at break	%	-32,8	IEC 60811-404
Absorption	%	+4,3	IEC 60811-404

■ Petrol (super lead-free) 168h at 30°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	8,5	IEC 60811-404
Variation in tensile strength	%	-15,0	IEC 60811-404
Elongation at break	%	143	IEC 60811-404
Variation in elongation at break	%	-20,6	IEC 60811-404
Absorption	%	-2,1	IEC 60811-404
■ SAE 20 168h at 70°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	10,9	IEC 60811-404
Variation in tensile strength	%	+9,0	IEC 60811-404
Elongation at break	%	170	IEC 60811-404
Variation in elongation at break	%	-5,6	IEC 60811-404
Absorption	%	+4,0	IEC 60811-404
■ Water 240h at 70°C	Unit	Typical value	Test method
Tensile strength	N/mm ²	9,8	IEC 60811-404
Variation in tensile strength	%	-2,0	IEC 60811-404
Elongation at break	%	148	IEC 60811-404
Variation in elongation at break	%	-17,8	IEC 60811-404
Absorption	%	+2,1	IEC 60811-404
■ Ozone resistance 168h / 40°C / 250 – 300pphm	Unit	Typical value	Test method
Requirement		no cracks	DIN VDE 0472-805

BURNING PROPERTIES *

■ Main burning properties	Unit	Typical value	Test method
LOI	%	37	ASTM D 2863 A
Temperature index	°C	300	ASTM D 2863 D
Toxicity index (max.)		0,9	NES 713
■ Acid gas emission	Unit	Typical value	Test method
Corrosivity: pH (min.)	-	5,5	IEC 60754-2
Conductivity (max.)	μS/ cm ⁻¹	14	IEC 60754-2

* pressed plaques, 165°C / 5 min.

** extruded tapes

PROCESSING GUIDE

■ **Extruder Type**

Standard extruders for elastomeric or thermoplastic processing.

■ **Screw configuration**

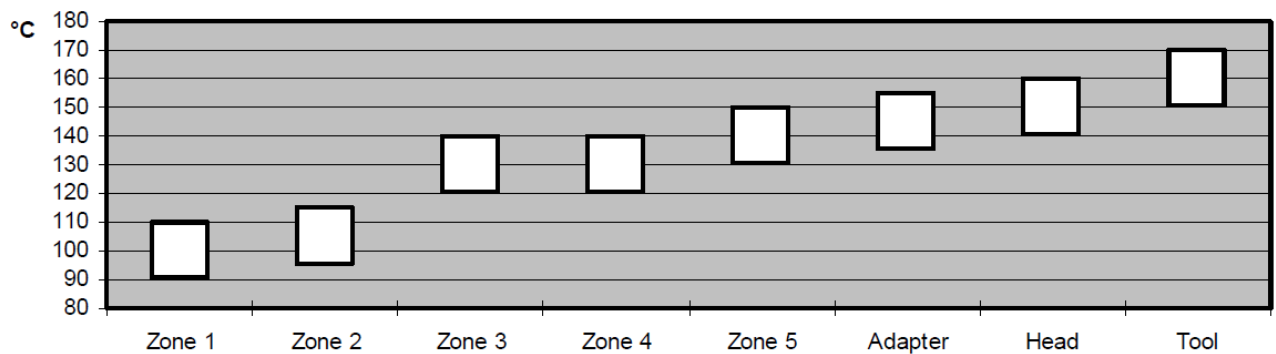
Low compression screw with L/D of 20 to 25 and compression ratio of 1:1.2

■ **Tooling**

Pressure, semi-compression or tube possible

■ **Temperature profile extruder**

This profile will vary slightly depending on extruder type, head design and output.



■ **Maximum mass temperature**

155 – 165°C

■ **Drying**

Not necessary if the compound has been stored in original packing under cool (max. 30°C) and dry conditions. If Mecoline compounds used from open bags, pre-drying during 4–6 hours a temperature of 60–70°C is recommended.

STORAGE INFORMATION

■ **Form & packaging**

Pellets in sizes 2.8mm & 5.5mm
Moisture-resistant bags (25kg) & octabins (alu-innerliner, max. 1250kg)

■ **Shelf life**

1 year after production

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