ELECTRICAL APPLICATION
Cable insulation

70 Shore A, EPDM, peroxide cure

		straight		blend with whiting	
Guide formulations of HOFFMANN MINERAL	M 432.0	3	4	8	9
Buna AP 258)*		130.0	130.0	130.0	130.0
Stearic acid		1.0	1.0	1.0	1.0
Zinkoxyd aktiv		5.0	5.0	5.0	5.0
Paraffin wax 54/56		4.0	4.0	4.0	4.0
SILLITIN Z 86		225.0	---	125.0	---
AKTISIL VM 56		---	225.0	---	125.0
Mikrosöhl 40		---	---	100.0	100.0
Process Oil P 460 (ex Sunpar 2280)		15.0	15.0	15.0	15.0
Vulkanox HS/LG		1.0	1.0	1.0	1.0
Vulkanox MB/MG		0.5	0.5	0.5	0.5
TAC/GR 50		2.0	2.0	2.0	2.0
Perkadox 14-40B-pd		8.0	8.0	8.0	8.0
Total phr		391.5	391.5	391.5	391.5

)* No longer available. Recommended: Keltan 3973

Mooney Viscosity						
ML (1+4) 120°C	DIN 53523, T3	MU	67	55	44	49
Mooney Scorch						
ML (5 MU) 120°C	DIN 53523, T4	min	6.4	10.0	22.6	14.0
Rotorless curemeter, 180°C						
t_5	DIN 53529, T3	min	1.1	1.1	1.3	1.2
t_{90}	DIN 53529, T3	min	10.3	8.9	8.6	8.9

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Schwabenthan extruder Polytest 30R, ∅ 30 mm 15D						
Temperature		°C		70-70-110		
@ 1 m/min extrusion rate						
Rating according to Garvey)*	ASTM D 2230		**3**14**3**	**3**14**3**	**3**14**2**	**3**14**2**
Torque		Nm	70	60	80	80
@ 50 rpm screw speed						
Rating according to Garvey)*	ASTM D 2230		**3**14**2**	**3**14**2**	**3**14**2**	**3**14**2**
Torque		Nm	90	85	90	90
Extrusion rate		cm/min	244	248	280	256
Extrusion rate		g/min	206	212	238	224

)* For cable extrusion, swelling (1. digit) and surface (3. digit) of the profiles are most relevant.
Rating: 1 = poor, 4 = very good

Physical properties						
Cure @ 180°C			**11 min**	**10 min**	**10 min**	**10 min**
Density	DIN EN ISO 1183-1	g/cm³	1.48	1.47	1.48	1.48
Hardness	DIN ISO 7619-1	Shore A	72	74	67	69
Modulus 100 %	DIN 53504, S2	MPa	4.0	7.4	2.5	3.9
Modulus 300 %	DIN 53504, S2	MPa	5.2	---	3.6	---
Tensile strength	DIN 53504, S2	MPa	7.2	12.2	7.5	9.3
Elongation at break	DIN 53504, S2	%	430	170	480	290
Rebound	DIN 53512	%	55	53	56	57
Tear resistance	DIN ISO 34-1, A	N/mm	9	4	8	4
Compression set	DIN ISO 815, B					
24 h @ 100°C		%	17	10	16	10
Volume resisitivity						
Original	DIN IEC 93	Ω cm	2.3×10^{15}	5.0×10^{15}	4.9×10^{15}	4.6×10^{15}
Immersion in deion. water @ 70°C	7d	Ω cm	2.5×10^{11}	6.3×10^{14}	4.2×10^{12}	9.8×10^{14}
	14d	Ω cm	6.3×10^{11}	9.6×10^{14}	1.5×10^{13}	8.7×10^{14}
	28d	Ω cm	2.9×10^{10}	4.5×10^{14}	3.1×10^{12}	5.2×10^{14}

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Air aging, 168 h @ 100°C					
Hardness	Shore A	73	75	67	68
Modulus 100 %	MPa	5.6	8.4	3.1	4.7
Tensile strength	MPa	7.7	12.9	6.8	10.0
Elongation at break	%	310	140	430	240
Δ Hardness	Shore A	+1	+1	0	-1
Δ Modulus 100 %	%	+40	+14	+24	+21
Δ Tensile strength	%	+7	+6	-9	+8
Δ Elongation at break	%, rel.	-28	-18	-10	-17

More information on this topic:

Non-black Fillers in Peroxide Cured EPDM Cable Insulation Compounds

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