



ELECTRICAL APPLICATION

Cable insulation

Medium and high voltage cable insulation

85 Shore A, EPDM, peroxide cure

Guide formulations of HOFFMANN MINERAL	M 613.1	SILFIT Z 91 with additional vinyl silane	AKTIFIT VM with additional vinyl silane	AKTIFIT VM without additional vinyl silane
EPDM		9	6	15
Masterbatch		100.00	100.00	100.00
Vulkanox HS/LG		14.61	14.61	14.61
Perkadox BC-FF		1.28	1.28	1.28
Paraffin wax		1.83	1.83	1.83
Silquest A-172NT		5.01	5.01	5.01
SILFIT Z 91		0.75	0.75	---
AKTIFIT VM		60.00	---	---
Total phr		---	60.00	60.00
		183.48	183.48	182.73

SILFIT Z 91 and AKTIFIT VM achieve excellent base properties.

SILFIT Z 91: for applications with somewhat lower requirements to dielectrical properties

AKTIFIT VM: for applications with high requirements to dielectrical properties

By using AKTIFIT VM, additional vinyl silane appears not to be essential in this formulation (15).

Mooney Viscosity

ML (1+4) 120°C	DIN 53523, T3	MU	29	30	29
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Mooney Scorch

ML (5 MU) 120°C	DIN 53523, T4	min	> 90	> 90	> 90
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Rotorless curemeter, 180°C

Mmin	DIN 53529, T3	Nm	0.040	0.039	0.040
Mmax	DIN 53529, T3	Nm	0.539	0.536	0.530
t ₅	DIN 53529, T3	min	0.39	0.42	0.40
t ₉₀	DIN 53529, T3	min	3.02	3.12	3.02



			SILFIT Z 91 with additional vinyl silane	AKTIFIT VM with additional vinyl silane	AKTIFIT VM without additional vinyl silane
	M 613.1		9	6	15
Physical properties					
Press cure 6 min @ 180°C					
Density	DIN 53479, A	g/cm ³	1.21	1.21	1.21
Hardness (piled S2)	DIN ISO 7619-1	Shore A	86	85	87
Modulus 50 %	DIN 53504, S2	MPa	3.5	3.9	3.6
Modulus 100 %	DIN 53504, S2	MPa	4.8	5.3	4.7
Modulus 200 %	DIN 53504, S2	MPa	9.7	10.3	9.1
Modulus 300 %	DIN 53504, S2	MPa	14.3	---	13.0
Tensile strength	DIN 53504, S2	MPa	15.0	15.0	13.6
Elongation at break	DIN 53504, S2	%	305	295	310
Tear resistance	DIN ISO 34-1, A	N/mm	8.6	8.5	8.8
Compression set 24 h @ 100°C, 25 % deflection	DIN ISO 815, B	%	8	11	10
Air aging, 168 h @ 100°C, DIN 53508					
Hardness (piled S2)		Shore A	88	84	85
Modulus 50 %		MPa	3.8	3.7	3.8
Modulus 100 %		MPa	5.0	5.1	5.1
Modulus 200 %		MPa	9.0	9.9	9.1
Modulus 300 %		MPa	12.7	---	12.8
Tensile strength		MPa	13.6	13.4	13.6
Elongation at break		%	325	270	325
Δ Hardness		Shore A	+2	-1	-2
Δ Modulus 50 %		%	+7	-4	+6
Δ Modulus 100 %		%	+4	-3	+7
Δ Modulus 200 %		%	-7	-3	0
Δ Modulus 300 %		%	-11	---	-2
Δ Tensile strength		%	-9	-11	0
Δ Elongation at break		%, rel.	+7	-8	+4



			SILFIT Z 91 with additional vinyl silane	AKTIFIT VM with additional vinyl silane	AKTIFIT VM without additional vinyl silane
	M 613.1		9	6	15
Volume resistivity, 500 V, reading after 1 min, 1 mm sheet					
relaxation 16 h / 80°C	DIN IEC 93	Ω cm	3.6 x 10 ¹⁵	4.7 x 10 ¹⁵	2.1 x 10 ¹⁵
Immersion in deionized water, 1000 h @ 90°C		Ω cm	1.0 x 10 ¹⁶	8.6 x 10 ¹⁵	5.6 x 10 ¹⁵
Dielectric loss factor tan δ, 23°C, 50 Hz, x 10⁻⁴					
relaxation 16 h / 80°C	DIN IEC 93		15	15	15
Immersion in deionized water, 1000 h @ 90°C			27	21	19
Dielectric loss factor tan δ, 90°C, 50 Hz, x 10⁻⁴					
relaxation 16 h / 80°C	DIN IEC 93		31	32	35
Immersion in deionized water, 1000 h @ 90°C			136	31	34

Note: 1 mm sheets for electrical measurements were cured in foil

More information on this topic:

[Calcined Neuburg Siliceous Earth in Medium and High Voltage Cable Insulations](#)

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