

## AUTOMOTIVE INDUSTRY

### Profile, sponge, black

#### Partial replacement of carbon black with NSE, electrically non-conductive

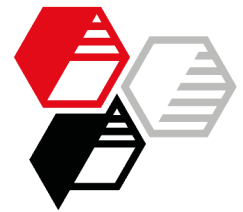
Density 0.50 g/cm<sup>3</sup>, EPDM, sulfur cure / CV cure

Guide formulations of HOFFMANN MINERAL Volume fraction Carbon Black (%)	conventional filled with CB		partial CB replacement – non-conductive				
	18.8		11.9				
	M 665	4/1	4/9	4/10	4/11	4/13	4/14
Keltan 8550C	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Carbon Black N-550	85.00	55.00	55.00	55.00	55.00	55.00	55.00
SILLIKOLLOID P 87	---	60.00	---	---	---	---	---
SILLITIN Z 86	---	---	60.00	---	---	---	---
SILLITIN N 82 )*	---	---	---	60.00	---	---	---
AKTISIL PF 216	---	---	---	---	60.00	---	---
AKTIFIT PF 115	---	---	---	---	---	60.00	---
Process Oil P 460 (ex Sunpar 2280)	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Zinkoxyd aktiv	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Stearic acid	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Kezadol GR	2.25	2.25	2.25	2.25	2.25	2.25	2.25
PEG 4000	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Rhenogran DPG-80	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Rhenogran MBT-80	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Rhenogran ZBEC-70	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Rhenogran TP-50	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Sulfur	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Rhenogran CLD-80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
TRACEL K 3/95	2.50	2.50	2.50	2.50	2.50	2.50	2.50
TRACEL OBSH 75 EPR-1	1.90	1.90	1.90	1.90	1.90	1.90	1.90
Total phr	284.27	314.27	299.27	314.27	314.27	314.27	314.27

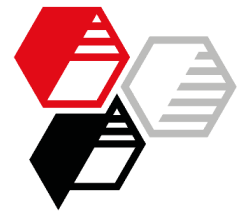
)\* No longer available. Recommended: SILLITIN N 75

#### Replacement of Carbon Black B N-550 with Neuburg Siliceous Earth:

- comparable cell structures
- distinct increase of volume resistivity
- nearly comparable modulus level with AKTISIL PF 216 and AKTIFIT PF 115 in the tensile test
- markedly reduced compound costs, even with functionalized Neuburg Siliceous Earth



			conventional filled with CB		partial CB replacement – non-conductive				
		M 665	4/1	4/9	4/10	4/11	4/13	4/14	
<b>Mooney Viscosity</b>									
ML (1+2) @ 120°C	DIN ISO 289-1	MU	40	39	42	43	42	41	
<b>Mooney Scorch</b>									
ML +5 @ 120°C	DIN ISO 289-2	min	5.0	4.9	4.5	4.5	4.5	4,7	
<b>Rotorless curemeter @ 200 °C</b>									
Cure yield	DIN 53529, T3	Nm	0.60	0.57	0.60	0.61	0.59	0.58	
Curing rate	DIN 53529, T3	Nm/min	1.27	1.29	1.28	1.28	1.25	1.28	
t <sub>90</sub>	DIN 53529, T3	min	1.1	1.3	1.2	1.1	1.2	1.1	
<b>Mechanical properties</b>									
<b>Curing in salt bath 3 min @ 200 °C</b>									
Density (foamed)	DIN EN ISO 1183-1	g/cm <sup>3</sup>	0.51	0.50	0.47	0.49	0.47	0.49	
Tensile strength	DIN 53504, S2	MPa	2.7	1.8	1.5	1.5	1.7	1.8	
Modulus 10 %	DIN 53504, S2	MPa	0.12	0.11	0.09	0.10	0.10	0.10	
Modulus 100 %	DIN 53504, S2	MPa	0.8	0.6	0.5	0.6	0.7	0.7	
Elongation at break	DIN 53504, S2	%	305	309	297	279	260	270	
Hardness	DIN ISO 7619-1	Shore A	23	20	18	19	19	20	
Tear resistance (trouser)	DIN ISO 34-1, A	N/mm	2.3	1.8	1.8	1.8	1.8	1.8	
Compression set 22 h @ 70°C, 50 %	DIN ISO 815-1, B	%	8.6	14	10	12	12	12	
Water absorption	ASTM D 1056	%	48	46	49	63	50	44	
<b>Electrical properties, DIN IEC 93</b>									
Voltage used		V	1	10	10	10	10	10	
Volume resistivity		Ω*cm	1.7E+08	2.2E+12	1.5E+12	1.6E+12	1.7E+12	1.4E+12	



**Comparable cell structures** (therefore only one exemplary illustration in each case)

conventional – filled with CB

partial CB replacement – non-conductive



**More information on this topic:**

[Partial Replacement of Carbon Black with Neuburg Siliceous Earth in Cellular EPDM Profile Compounds](#)

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