MACHINERY and EQUIPMENT
Appliance, Gasket, light-colored

Neuburg Siliceous Earth as an acid resistant and tintable alternative to carbon black
65 Shore A, FKM, peroxide cure

		Control N-990	AKTIFIT VM	AKTIFIT PF 111	AKTIFIT AM	AKTIFIT PF 115	AKTISIL AM	AKTISIL Q
Guide formulations of HOFFMANN MINERAL	M 638.0	31	10	11	8	9	5	7
Vitalon GAL-200S		100	100	100	100	100	100	100
Zinkoxyd aktiv		3	3	3	3	3	3	3
Diak No. 7		3	3	3	3	3	3	3
Varox DBPH-50		2	2	2	2	2	2	2
Carbon Black N-990		30	---	---	---	---	---	---
AKTIFIT VM		---	30	---	---	---	---	---
AKTIFIT PF 111		---	---	30	---	---	---	---
AKTIFIT AM		---	---	---	30	---	---	---
AKTIFIT PF 115		---	---	---	---	30	---	---
AKTISIL AM		---	---	---	---	---	30	---
AKTISIL Q		---	---	---	---	---	---	30
Total phr		138	138	138	138	138	138	138

Evaluation Neuburg Siliceous Earth vs. carbon black N-990

The rating indicates which type of Neuburg Siliceous Earth improves (+) or equals the corresponding property compared to carbon black. Signs highlighted in green mean that this product within Neuburg Siliceous Earth achieves the best value for this property.

Cure speed	=	=	+	+	+	=
Viscosity	+	+	+	+	+	+
Tensile strength	+	=	=	=	+	=
Elongation at break		=	=	=	=	
Modulus 100 %	+	+	+	+	+	+
Tear resistance		=	=	+	=	=
Compression set ISO, 200°C	=	=	=	=	=	=
Compression set ISO, 200°C, no post cure	=	=	=	=	=	+
Compression set ISO, 232°C	=	=				=
Compression set ISO, 232°C, no post cure	=					+
Compression set VW 23°C	=	=	=		+	=
Compression set VW 150°C	+	+	=	=	+	=
Hot air resistance 210°C	=	=	=		=	+
Hot air resistance 230°C	+	=	=		=	+
Fuel resistance	=	=	=	=	=	=
Oil resistance		+	+		+	+
Resistance to acetic acid	=	=	=	=	=	+

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			Control N-990	AKTIFIT VM	AKTIFIT PF 111	AKTIFIT AM	AKTIFIT PF 115	AKTISIL AM	AKTISIL Q
		M 638.0	31	10	11	8	9	5	7
Mooney Viscosity									
ML (1+4) 100°C	DIN 53523, T3	MU	67	63	63	64	66	62	61
Rotorless curemeter, 177°C									
M_{min}	DIN 53529, T3	Nm	0.04	0.04	0.04	0.04	0.05	0.04	0.04
V_{max}	DIN 53529, T3	Nm/min	3.3	3.4	3.5	4.1	3.8	4.0	3.6
t_{90}	DIN 53529, T3	min	0.8	0.8	0.9	0.8	0.8	0.8	0.8
Mechanical properties									
Press cure 7 min @ 177°C									
Hardness	DIN ISO 7619-1	Shore A	65	64	65	65	65	64	63
Modulus 50 %	DIN 53504, S2	MPa	1.58	1.70	1.68	1.68	1.72	1.83	1.60
Modulus 100 %	DIN 53504, S2	MPa	3.2	3.9	3.5	3.7	3.6	4.2	3.6
Tensile strength	DIN 53504, S2	MPa	17	22	16	18	17	19	16
Elongation at break	DIN 53504, S2	%	330	278	336	364	395	312	257
Tear resistance	DIN ISO 34-1, A	N/mm	4.6	3.1	5.4	4.7	6.0	4.5	4.0
Compression set	DIN ISO 815, B								
70 h @ 200°C, 25 % deflection		%	21	20	21	20	21	21	18
70 h @ 232°C, 25 % deflection		%	26	25	28	28	32	30	20
Post cure 2 h @ 232°C									
Hardness	DIN ISO 7619-1	Shore A	66	65	66	66	65	66	65
Modulus 50 %	DIN 53504, S2	MPa	1.66	1.75	1.76	1.83	1.84	1.92	1.72
Modulus 100 %	DIN 53504, S2	MPa	3.6	4.4	4.0	4.6	4.3	4.9	4.3
Tensile strength	DIN 53504, S2	MPa	21	26	23	23	20	24	20
Elongation at break	DIN 53504, S2	%	314	272	351	320	339	311	271
Tear resistance	DIN ISO 34-1, A	N/mm	4.4	3.2	4.9	4.5	6.7	3.9	4.1
Abrasion (10 N)	DIN ISO 4649	mm^3	53	60	72	67	74	71	73
Compression set	DIN ISO 815, B								
70 h @ 200°C, 25 % deflection		%	20	21	19	20	20	21	20
70 h @ 232°C, 25 % deflection		%	26	26	24	30	32	29	23
Compression set	VW PV 3307								
94 h @ 23°C, 50 % deflection		%	50	53	50	48	54	39	48
94 h @ 150°C, 50 % deflection		%	41	37	36	38	39	34	38
Air aging, DIN 53508, 504 h @ 210°C, post cured specimen, measured 30 min after exposure									
Hardness		Shore A	69	68	68	68	69	69	67
Tensile strength		MPa	24	25	23	25	19	22	24
Elongation at break		%	314	323	320	330	252	304	356
Δ Hardness		Shore A	+3	+2	+2	+1	+3	+2	0
Δ Tensile strength		%	+16	-3	+3	+8	-2	+8	+11
Δ Elongation at break		%, rel.	0	+19	-9	+3	-26	-2	+31

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		Control N-990	AKTIFIT VM	AKTIFIT PF 111	AKTIFIT AM	AKTIFIT PF 115	AKTISIL AM	AKTISIL Q
	M 638.0	31	10	11	8	9	5	7
Air aging, DIN 53508, 94 h @ 230°C, post cured specimen, measured 30 min after exposure								
Hardness	Shore A	69	67	68	67	68	68	65
Tensile strength	MPa	24	26	27	27	22	28	23
Elongation at break	%	292	283	313	314	247	299	331
Δ Hardness	Shore A	+3	+2	+2	+1	+3	+2	0
Δ Tensile strength	%	+14	+2	+18	+17	+11	+15	+16
Δ Elongation at break	%, rel.	-7	+4	-11	-2	-27	-4	+22
Immersion in FAM B, 70 h @ 23°C, post cured specimen								
Hardness	Shore A	59	58	59	58	58	58	58
Tensile strength	MPa	12	14	11	12	10	11	10
Elongation at break	%	231	220	255	246	268	238	206
Δ Hardness	Shore A	-7	-7	-7	-8	-7	-8	-7
Δ Tensile strength	%	-44	-46	-51	-48	-50	-53	-49
Δ Elongation at break	%, rel.	-26	-19	-27	-23	-21	-24	-24
Δ Weight	%	+6.7	+7.3	+7.8	+8.0	+8.0	+6.8	+8.0
Δ Volume	%	+15	+18	+19	+19	+19	+17	+19
Immersion in OS 206 304, 168 h @ 150°C, post cured specimen								
Hardness	Shore A	65	65	65	65	66	65	64
Tensile strength	MPa	17	19	21	22	16	22	21
Elongation at break	%	266	210	295	291	231	281	291
Δ Hardness	Shore A	-1	0	-1	-1	+1	-1	-1
Δ Tensile strength	%	-19	-26	-7	-3	-20	-9	+2
Δ Elongation at break	%, rel.	-15	-23	-16	-9	-32	-10	+7
Δ Weight	%	+0.8	+0.8	+0.7	+0.6	+0.6	+0.7	+0.6
Δ Volume	%	+1.4	+1.4	+1.2	+0.9	+1.4	+1.2	+0.7
Immersion in acetic acid pH3, 168 h @ 100°C, post cured specimen								
Hardness	Shore A	54	52	51	51	52	47	51
Tensile strength	MPa	19	21	15	17	16	19	20
Elongation at break	%	268	265	355	316	304	300	274
Δ Hardness	Shore A	-12	-13	-15	-15	-13	-19	-14
Δ Tensile strength	%	-10	-20	-35	-24	-18	-22	-3
Δ Elongation at break	%, rel.	-15	-3	+1	-1	-10	-4	+1
Δ Weight	%	+17	+20	+17	+26	+19	+24	+23
Δ Volume	%	+30	+37	+34	+50	+37	+47	+43

More information on this topic is available in this technical report:

Neuburg Silliceous Earth as an acid resistant and tintable alternative to carbon black N990 in peroxide cured FKM

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