AUTOMOTIVE INDUSTRY
Gasket and hose, solid, light-colored

Resistant to urea solution (AdBlue®)
65 Shore A, EPDM, peroxide cure

Start formulation VW TL 52686

		Control N-990	AKTISIL VM 56
Guide formulation of HOFFMANN MINERAL	M 660.0	26	27
Keltan 4450S		100	100
Carbon Black N-990		120	---
AKTISIL VM 56		---	120
Process Oil P 460 (ex Sunpar 2280)		20	20
Vulkanox HS/LG		1	1
TAC/GR 70		1	1
Perkadox 14-40B-pd-s		5	5
Total phr		247	247

The replacement of Carbon Black N-990 by **AKTISIL VM 56** leads to a number of advantages:
- higher modulus at 100 % elongation
- shorter curing time and therefore shorter cycle time in production
- comparable resistance to urea solution (AdBlue®)
- better surface quality and improved collapse resistance during extrusion
- tintable products/components
- no blooming of decomposition products, therefore no subsequent cleaning step necessary
- reduction of compound costs

More information on this topic:
Urea-resistant EPDM Gaskets and Hoses - VW TL 52686

Münchener Straße 75 • DE-86633 Neuburg (Donau)
Phone +49 8431 53-0 • info@hoffmann-mineral.com

			Control N-990	AKTISIL VM 56
		M 660.0	26	27
Mooney Viscosity				
ML (1+4) @ 120°C	DIN ISO 289-1	MU	46	53
Mooney Scorch				
ML +5 @ 120°C	DIN ISO 289-2	min	77	56
Rotorless curemeter, 180°C				
Mmin	DIN 53529, T3	Nm	0.09	0.09
Mmax	DIN 53529, T3	Nm	1.03	0.96
Mmax-Mmin	DIN 53529, T3	Nm	0.95	0.87
Vmax	DIN 53529, T3	Nm/min	0.40	0.54
t_5	DIN 53529, T3	min	0.46	0.39
t_{10}	DIN 53529, T3	min	0.59	0.47
t_{90}	DIN 53529, T3	min	5.58	4.66
tan delta		-	0.04	0.04

Physical properties					**VW**
Press cure @ 180°C			**6.1 min**	**5.1 min**	**TL 52686**
Hardness	DIN ISO 7619-1	Shore A	61	65	65 ± 5
Tensile strength	DIN 53504, S2	MPa	10.8	11.7	≥ 8
Modulus 50 %	DIN 53504, S2	MPa	1.4	2.0	
Modulus 100 %	DIN 53504, S2	MPa	2.8	4.3	≥ 2.5
Elongation at break	DIN 53504, S2	%	305	248	≥ 200
Rebound	DIN 53512	%	59	59	
Tear resistance (trouser)	DIN ISO 34-1, A	N/mm	3.1	3.1	
Compression set					
24 h @ 23°C, 25 % deflection	DIN ISO 815, B	%	13	14	
24 h @ 120°C, 25 % defl.	DIN ISO 815, B	%	22	28	
94 h @ 23°C, 50 % defl., 5 s	P-VW 3307	%	5	6	< 20
22 h @ 120°C, 50 % defl., 5 s	P-VW 3307	%	7	10	< 65

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		Control N-990	AKTISIL VM 56	
	M 660.0	26	27	
Air aging, 94 h @ 120°C, measuring after 30 min				**VW TL 52686**
Hardness	Shore A	60	65	
Tensile strength	MPa	11.4	13.9	≥ 8
Modulus 50 %	MPa	1.5	2.3	
Modulus 100 %	MPa	2.9	5.1	
Elongation at break	%	307	225	≥ 150
Tear resistance	N/mm	3.2	2.7	
Δ Hardness	Shore A	-1	0	0 to +5
Δ Tensile strength	%	+5.1	+18.8	
Δ Modulus 50 %	%	+4.0	+12.8	
Δ Modulus 100 %	%	+3.8	+20.7	
Δ Elongation at break	%, rel.	+0.6	-9.4	
Δ Tear resistance	%	+1.6	-11.8	
Air aging, 504 h @ 120°C, measuring after 30 min				
Hardness	Shore A	61	67	
Tensile strength	MPa	11.8	12.8	≥ 8
Modulus 50 %	MPa	1.6	2.3	
Modulus 100 %	MPa	3.1	5.2	
Elongation at break	%	291	206	≥ 130
Tear resistance	N/mm	3.2	2.6	
Δ Hardness	Shore A	0	+2	0 to +10
Δ Tensile strength	%	+8.9	+9.1	
Δ Modulus 50 %	%	+10.6	+15.4	
Δ Modulus 100 %	%	+12.3	+23.1	
Δ Elongation at break	%, rel.	-4.6	-17.2	
Δ Tear resistance	%	+2.9	-16.3	

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		Control N-990	AKTISIL VM 56	
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Immersion in urea solution 32 % (ISO 22241), 94 h @ 80°C, cool down 90 min				**VW TL 52686**
Hardness	Shore A	61	66	
Tensile strength	MPa	12.0	11.2	≥ 8
Modulus 50 %	MPa	1.5	2.0	
Modulus 100 %	MPa	2.9	4.1	
Elongation at break	%	315	250	≥ 200
Δ Hardness	Shore A	0	+1	± 5
Δ Tensile strength	%	+11	-4.7	
Δ Modulus 50 %	%	+5.1	+0.2	
Δ Modulus 100 %	%	+6.3	-3.5	
Δ Elongation at break	%, rel.	+3.2	+0.6	
Δ Weight	%	-0.2	+0.1	0 to +3
Δ Volume	%	-0.3	+0.1	
Immersion in urea solution 32 % (ISO 22241), 504 h @ 80°C, cool down 90 min				
Hardness	Shore A	61	65	
Tensile strength	MPa	11.9	11,2	≥ 8
Modulus 50 %	MPa	1.5	2,0	
Modulus 100 %	MPa	2.9	4,1	
Elongation at break	%	320	247	≥ 200
Δ Hardness	Shore A	0	0	± 5
Δ Tensile strength	%	+9.7	+4.7	
Δ Modulus 50 %	%	+5.3	+1.8	
Δ Modulus 100 %	%	+6.3	-2.7	
Δ Elongation at break	%, rel.	+5.0	-0.4	
Δ Weight	%	-0.4	+0.1	0 to +5
Δ Volume	%	-0.4	+0.4	

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Blooming

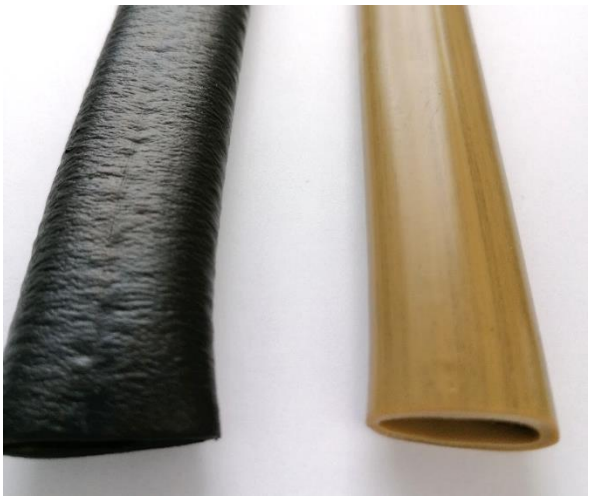
1 day after vulcanization

no blooming

Hose extrusion

D_a: 20 mm, D_i: 16,5 mm
Haul-off speed: 5 m/min

Surface quality



Collapse resistance

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