AUTOMOTIVE INDUSTRY
Molding, light-colored

Resistant to Diesel and rape-oil methyl ester (RME)
65 Shore A, HNBR, peroxide cure

Specification VW TL 524.33

Guide formulation of Zeon Europe	RRS 36
Zetpol 1010	100.0
AKTISIL VM 56	70.0
Rhenosin W 759	10.0
Naugard 445	1.5
Rhenogran ZMMBI-50	3.0
Zinkoxyd aktiv	3.0
Stearic acid	2.0
Luperox F40	8.0
Saret SR-517	5.0
Total phr	202.5

Compound preparation

Branbury mixer		
Loading	%	80
Rotor speed	rpm	60
Temperature	°C	40
Mixing method:		
Add polymer and all rest	min	0
Ram lift and sweep	min	3
Discharge	min	4
Indicated discharge temperature	°C	76
Pyro dump temperature	°C	90
Final power consumption	kWh	0.238
Mill mix cycle		
Mill temperature	°C	50
Nip	mm	2
Band up, cut and fold	min	0
Strip and cool	min	3

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

			RRS 36	
Mooney Viscosity				
ML (1+4) 100°C	MU		59	
Monsanto MDR		**180°C**	**190°C**	
Test time	min	12	6	
ML, minimum	dNm	0.88	0.85	
MH, maximum	dNm	17.14	16.11	
MH – ML	dNm	16.26	15.26	
ts_2	min	0.83	0.62	
tc_{50}	min	1.74	1.04	
tc_{80}	min	---	1.62	
tc_{90}	min	4.15	2.05	
Physical properties				**VW TL 524.33**
Hardness (3 piled sheets)	Shore A		66	65 ± 5
Tensile strength	MPa		19.6	> 10
Modulus 100 %	MPa		3.4	
Modulus 200 %	MPa		6.8	
Modulus 300 %	MPa		9.3	
Modulus 400 %	MPa		12.1	
Modulus 500 %	MPa		18.4	
Elongation at break	%		490	250 to 550
Compression set				
72 h @ 125°C	%		30.5	TBA
168 h@/ 125°C	%		36.0	TBA
504 h @ 125°C	%		54.5	TBA
according to VW specification	%		73.5	TBA
Ozone resistance				
48 h @ 23°C, 20 % strain, 200 pphm			ok	no cracks
Cold bend test 22 h @ -30°C			ok	no cracks
Low temperature retraction TR 10			-20	

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

			RRS 36	VW TL 524.33
Air aging (Geer), 94 h @ 125°C				
Hardness (3 piled sheets)	Shore A		71	
Tensile strength	MPa		20.5	> 10
Modulus 100 %	MPa		4.7	
Elongation at break	%		460	> 250
Δ Hardness	Shore A		+5	0 to +8
Δ Tensile strength	%		+4.6	
Δ Modulus 100 %	%		+38.2	
Δ Elongation at break	%, rel.		-6.1	
Immersion in Diesel, 94 h @ 23°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	65	66	
Tensile strength	MPa	20.9	20.2	> 10
Modulus 100 %	MPa	3.3	3.6	
Elongation at break	%	510	500	> 250
Δ Hardness	Shore A	-1	0	-6 to +2
Δ Tensile strength	%	+6.6	+3.1	
Δ Modulus 100 %	%	-2.9	+5.9	
Δ Elongation at break	%, rel.	+4.1	+2.0	
Δ Volume	%	+2.3	-0.3	
Δ Weight	%	+1.5	---	0 to +5
Δ Weight	%	---	-0.4	-2 to 0
Immersion in RME, 94 h @ 23°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	62	65	
Tensile strength	MPa	20.4	19.1	> 10
Modulus 100 %	MPa	3.0	3.0	
Elongation at break	%	520	500	> 250
Δ Hardness	Shore A	-4	-1	-6 to +2
Δ Tensile strength	%	+4.1	-2.6	
Δ Modulus 100 %	%	-11.8	-11.8	
Δ Elongation at break	%, rel.	+6.1	+2.0	
Δ Volume	%	+2.5	+1.3	
Δ Weight	%	+1.4	+0.7	0 to +10

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

		RRS 36		VW TL 524.33
Immersion in Diesel, 94 h @ 80°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	59	65	
Tensile strength	MPa	20.0	18.5	> 10
Modulus 100 %	MPa	3.0	3.9	
Elongation at break	%	510	470	> 250
Δ Hardness	Shore A	-7	-1	-12 to +2
Δ Tensile strength	%	+2.0	-5.6	
Δ Modulus 100 %	%	-11.8	+14.7	
Δ Elongation at break	%, rel.	+4.1	-4.1	
Δ Volume	%	+8.6	+0.04	
Δ Weight	%	+5.1	---	-2 to +8
Δ Weight	%	---	-0.5	-5 to +1
Immersion in RME, 94 h @ 80°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	58	60	
Tensile strength	MPa	19.2	18.2	> 10
Modulus 100 %	MPa	3.1	3.0	
Elongation at break	%	480	490	> 250
Δ Hardness	Shore A	-8	-6	-12 to +2
Δ Tensile strength	%	-2.0	-7.1	
Δ Modulus 100 %	%	-8.8	-11.8	
Δ Elongation at break	%, rel.	-2.0	0	
Δ Volume	%	+8.5	+6.1	
Δ Weight	%	+5.1	+3.5	0 to +15

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

		RRS 36		VW TL 524.33
Immersion in Diesel, 504 h @ 80°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	61	66	
Tensile strength	MPa	20.0	17.3	> 7
Modulus 100 %	MPa	3.3	4.3	
Elongation at break	%	500	470	> 150
Δ Hardness	Shore A	-5	0	-17/-15 to +2
Δ Tensile strength	%	+2.0	-11.7	
Δ Modulus 100 %	%	-2.9	+26.5	
Δ Elongation at break	%, rel.	+2.0	-4.1	
Δ Volume	%	+7.6	-0.9	
Δ Weight	%	+4.5	---	-3 to +15
Δ Weight	%	---	-1.2	-10 to +1
Immersion in RME, 504 h @ 80°C		**after stress**	**re-dried 22 h @ 80°C**	
Hardness (3 piled sheets)	Shore A	60	61	
Tensile strength	MPa	18.8	17.3	> 7
Modulus 100 %	MPa	3.3	3.4	
Elongation at break	%	450	450	> 150
Δ Hardness	Shore A	-6	-5	-17/-15 to +2
Δ Tensile strength	%	-4.1	-11.7	
Δ Modulus 100 %	%	-2.9	0	
Δ Elongation at break	%, rel.	-8.2	-8.2	
Δ Volume	%	+10.2	+7.3	
Δ Weight	%	+6.4	+4.6	0 to +35

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

		RRS 36
Immersion in RME, 168 h @ 100°C		
Hardness (3 piled sheets)	Shore A	57
Tensile strength	MPa	19.6
Modulus 100 %	MPa	3.3
Elongation at break	%	460
Δ Hardness	Shore A	-9
Δ Tensile strength	%	0
Δ Modulus 100 %	%	-2.9
Δ Elongation at break	%, rel.	-6.1
Δ Volume	%	+9.8
Δ Weight	%	+5.8
Immersion in RME, 504 h @ 100°C (RME refreshed every 168 h)		
Hardness (3 piled sheets)	Shore A	58
Tensile strength	MPa	12.6
Modulus 100 %	MPa	2.4
Elongation at break	%	410
Δ Hardness	Shore A	-8
Δ Tensile strength	%	-35.7
Δ Modulus 100 %	%	-29.4
Δ Elongation at break	%, rel.	-16.3
Δ Volume	%	+7.3
Δ Weight	%	+4.6
Immersion in RME, 1008 h @ 100°C (RME refreshed every 168 h)		
Hardness (3 piled sheets)	Shore A	55
Tensile strength	MPa	13.9
Modulus 100 %	MPa	3.7
Elongation at break	%	350
Δ Hardness	Shore A	-11
Δ Tensile strength	%	-29.1
Δ Modulus 100 %	%	+8.8
Δ Elongation at break	%, rel.	-28.6
Δ Volume	%	+29.1
Δ Weight	%	+20.9

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