

LupoCom R

Introduction.

LupoCom R is a range of stabilised and viscosity modified EPDM grades with medium molecular weight distribution.

LupoCom R grades exhibit an unique combination of low to very low Mooney viscosities, high elasticity, intrinsic strength and supply in granular form

LupoCom R in unvulcanised applications

Due to their electrical properties, high strength, low viscosity, elasticity and ability to absorb large amounts of anorganic fillers like BaSO₄, ZnO and CaCO₃, LupoCom R grades form an excellent base for uncured and highly filled compounds, notably in applications like cable filling mass and sound deadening sheet.

Because of their low viscosity and granular form, LupoCom R grades contribute to high throughput and low cycle times on extruders, respectively conventional kneaders.

Properties of LupoCom R grades:

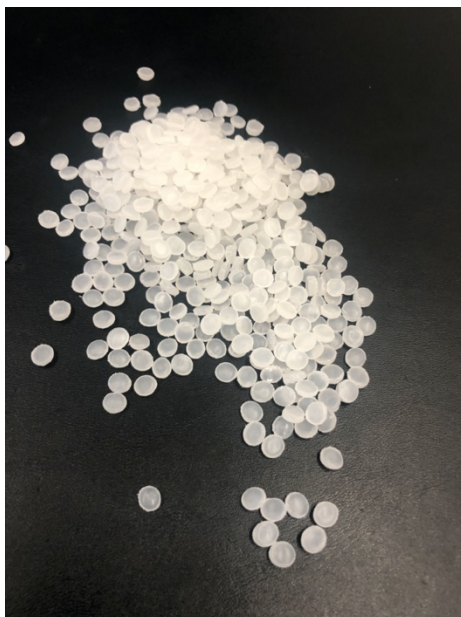
Property	Unit	Test method	44506	47503	61372	78202
Mooney viscosity*	MU	ISO 289-1	15-20	20-25	30-35	40-45
Ethylene content	wt %	ASTM D 3900	78	78	77	75
ENB content	wt %	ASTM D 6047	2,2	2,4	3,1	3,9
Density	g/cc	ISO 1183	0,877	0,877	0,877	0,876
Melt flow index**	dg/min	ISO 1133	7	5	3	1,5
Hardness	Shore A	ISO 868	80	79	77	76

*ML (1+4), 125°C ** (190°C, 10 kgf)

Note: These are typical values, not to be construed as specifications. The physical properties depend on manufacturing conditions so customers should confirm the performance of any product by using own tests.

Packaging; twofold stackable boxes of 500 kg with PE liner on pallets

Storage: The products should not be exposed to light, stored dry and at temperatures below 30°C. Under these conditions the shelf life is 12 months from the date of production



LupoCom R grades in cured compounds.

LupoCom R grades can be cured with both sulphur as well as peroxide-based systems, the choice of the curing system is determined by application and use. Where sulphur-based systems offer higher tear and tensile strength, allow the use of a wider range of fillers and are generally lower in costs, peroxide cured LupoCom R grades exhibit the excellent properties of premium grade EPDM, notably enhanced level of aging and temperature resistance, better resistance to oils and chemicals and lower compression set. Peroxide cured LupoCom R grades have less tendency to bloom.

In general, peroxide cured LupoCom R grades are resistant to

- Steam
- Hot water
- Ketones
- Alcohols
- Acids (organic and inorganic)
- Engine coolants

In general, peroxide cured LupoCom R grades are not resistant to

- Greases
- Mineral oils
- Fuels

Peroxide cured LupoCom R grades are therefore not recommended for use in environments that involve petroleum oil, grease, hydrocarbons or gasoline.

Applications

LupoCom R grades can be used in a variety of demanding applications. They unfold heat-resistant performance and processing characteristics that exceed those as offered by general-purpose and natural rubbers.

LupoCom R grades offer a well-balanced property profile that supports a broad spectrum of applications and which comes with the following benefits:

- Heat resistance
 - Excellent low temperature flexibility
 - Elastic properties under compression
 - Excellent physical properties, even at high filler loadings
 - Outstanding electrical properties
 - Ozone and weather resistance
 - Water, steam and polar fluid resistance
 - **Unmatched low viscosity in granular form**
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- **Automotive.** Due to its flexibility, resiliency, and weatherability, LupoCom R grades can be used in a variety of applications like seals, weather stripping, wire and cable harnesses, hoses and brake system
 - **Industrial.** Industrial applications involve LupoCom R for its electrical and waterproof properties, its resilience and flexibility. LupoCom R can be used in parts such as O-rings, hoses, gaskets, water systems, in electrical applications like connectors insulators, for wire and cable. Other industrial applications include diaphragms, belts pipes, fittings and grommets.
 - **HVAC.** Due to its weather and temperature resistance, LupoCom R grades can be used in insulation, grommets, seals and tubing.
 - **Construction.** LupoCom R exhibits excellent insulating and weather resistance, this combined with waterproof capabilities, roofing applications are a major outlet for LupoCom R. Other applications include sealant and seals, pool and tank liners.

LupoCom R grades in peroxide cured compounds.

Here below a case study is presented, involving the range of LupoCom R and cured with a basic peroxide system with the following compositions:

LupoCom R	78202	61372	47503	44506
	100.00			
		100.00		
			100.00	
				100.00
FEF-N550	60.00	60.00	60.00	60.00
Sunpar 2280	15.00	15.00	15.00	15.00
TAIC-50% (silica)	5.60	5.60	5.60	5.60
Trigonox 101-50Dpd	7.80	7.80	7.80	7.80
Total phr	188.40	188.40	188.40	188.40

In the table here below the following data are presented:

- Rheometer details
- Mooney viscosity
- Hardness
- Tensile properties
- Tear resistance
- Rebound resilience
- Compression set

LupoCom R		78202	61372	47503	44506
Rheometer MDR2000E, 175°C, 30 min, 0.5° osc angle		ISO 6502-3			
ts2	[min]	0.42	0.45	0.51	0.53
t5	[min]	0.43	0.47	0.50	0.51
t50	[min]	1.96	2.01	2.06	2.05
t90	[min]	8.23	8.33	8.25	8.15
ML	[Nm]	0.20	0.17	0.13	0.12
MH	[Nm]	4.63	4.60	3.74	3.58
Delta S	[Nm]	4.44	4.42	3.62	3.46

Mooney MV2000E ML(1+4)125°C		ISO 289-1			
Initial	[MU]	82.7	70.2	53.1	48.2
ML (1+4) 125°C	[MU]	58.8	50.0	37.4	34.5

Hardness °ShA, SLT, 1x10 mm		ISO 48-4 (Shore A)			
Hardness	[°ShA]	85	88	88	90

Hardness , micro-IRHD on tensile sheet (2mm)		ISO 48-4 (Shore A)			
Hardness	[°ShA]	87	89	90	91

Tensile properties		ISO 37, type 2			
Tensile strength at max	[MPa]	21.9	20.2	19.1	19.7
Elongation at break	[%]	160	144	175	184
Modulus 25%	[MPa]	3.1	3.6	3.4	3.8
Modulus 50%	[MPa]	5.2	5.8	5.2	5.6
Modulus 100%	[MPa]	12.1	12.6	10.0	10.7

Tear resistance		ISO 34-1, Method C			
Maximum force	[N]	56	59	62	66
Tear resistance	[kN/m]	25	29	33	35

Rebound resilience, 23 C (Schob, 12.5mm)		ISO 4662, metod A (non-rotating)			
Rebound resilience	[%]	55	54	54	52

Compression set, 72 hrs at 150°C		ISO 815-1, method A			
Compression set	[%]	12	12	11	13

Discussion;

The overview shows quite remarkable results, rheological and physical properties remain intact to a large extent despite the considerable spread in Mooney viscosity of both the raw polymer as well as the compounds. It suggests the broad potential of low viscosities in granular form, notably the combination of **fast processing and attractive properties**.

With decreasing Mooney viscosity of the compounds, the **delta torque** (as indication for lower crosslink efficiency) becomes lower as well. This can be adjusted to a certain extent by adjustment of the peroxide, resp. TAIC content.

The **hardness** increases somewhat with decreasing viscosity, if needed this can be adjusted by a slight increase of the oil content.

The **tensile properties** (strength and moduli) vary somewhat with decreasing viscosity, the **elongation at break** remains at the same level.

Tear resistance shows a considerable increase with decreasing viscosity.

Rebound resilience as well as **compression set** remain largely intact and are hardly depending on Mooney viscosity

Conclusion:

LupoCom R grades, all supplied in granular form, combine low to very low Mooney viscosity with attractive mechanical properties while offering easy and fast handling and unmatched processing both with extruders as well as conventional kneaders.

The overview of properties indicates a broad field of applications in a variety of industries.

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