VULKOLLAN®

VULKOLLAN® in its classic form is a polyurethane elastomer based on naphthalane 1,5-disocyanate Desmodur® 15 (NDI), polyester polyol and special chain extenders. VULKOLLAN® is produced by hot casting.

The raw materials used for VULKOLLAN® are subject to tight specifications and strict quality controls. All licensed processors must follow COVESTRO guidelines for VULKOLLAN® formulations and production processes, otherwise they cannot use the name VULKOLLAN®.

VULKOLLAN® wheels take up to 4 weeks to produce, due to the stabilizing requirements needed. Thus it is important to allow adequate time for any application.

Stated loads shown are for operation under ideal conditions, i.e. the wheel operates infrequently on a smooth surface without axial loading.

Thus load ratings must be reduced for operation under any or all of the following conditions:

- **Frequent use in excess of 45 minutes continuous:** reduce loadings by 25%
- **Driving applications:** reduce loadings by 30%
- **Speeds 6-10 kph (3.73 - 6.21 mph):** reduce loads by 20%
- **Speeds 10-16 kph (6.21 - 10 mph):** reduce loadings by 30%

Vulkollan® Nomenclature

The number following the work Vulkollan® indicates the content in g Desmodur 15 per 100 g of polyester. The shore hardness increases with the Desmodur 15 content.

e.g. Vulkollan® 25 = 25 parts by weight of Desmodur 15 to 100 parts by weight of polyester

TYPICAL PROPERTIES*

	Test standard		Vulkollan®			
Mechanical properties	**ISO**	**Units**	**18**	**21**	**25**	**9**
Shore A/D hardness	868		83/29	89/35	92/36	95/40
Density	1183	Mg/m^3	1.26	1,26	1.26	1.26
Stress at 100% strain	37	MPa	4.3	5.9	8.0	10.6
Stress at 300% strain	37	MPa	7.8	10.4	12.8	15.8
Ultimate tensile strength	37	MPa	50	54	53	42
Elongation at break	37	%	660	700	740	692
Tear propagation resistance	34	kN/m	31	38	54	67
Rebound resilience	4662	%	65	64	62	61
Abrasion	4649	mm^3	37	32	28	26
Taber abrasion (S42/4.9 N)	9352	mg	3.5	4.0	6.1	7.5
Compression set	815					
70 h / 23°C						
24 h/ 70°C						
Linear coefficient of thermal expansion		%	8	9	10	14

*The figures are intended as guide values for a standard Vulkollan® formulation.

VULKOLLAN® PROPERTIES

SOLID VULKOLLAN® - MECHANICAL PROPERTIES

VULKOLLAN® can be produced in hardness ranging from about 65 Shore A to about 70 Shore D. The mechanical properties are particularly favorable between about 80 Shore A and 40 Shore D, so these grades of Vulkollan® have the greatest share of the market.

SHORE HARDNESS

Shore Hardness is determined by testing the indentation resistance. The indentation resistance with which the elastomer opposes a spring-mounted needle is measured and displayed on a scale of 0 to 100. Shore A testing is used for softer elastomers. The Shore D scale is preferred from about 90 Shore A.

ULTIMATE TENSILE STRENGTH

Tensile Stress is measured on specially shaped test bars in tensile testing machines and is indicated as a function of the strain. Testing is normally at 100%, 300% and a breakage. VULKOLLAN® displays very high strength values. The test bars only tear after elongation to over 7 times the original length. Tensile strength testing is frequently used for quality control.

TEAR PROPOGATION

Tear propogation resistance is measured by stretching a notched specimen. High tear propogation resistance values denote reliable performance even of damaged parts.

ABRASION

Abrasion is measured by various methods, normally according to ISO 4649 (“abrasion roll”) and ISO 9352 (“Taber”). The elastomer specimens are rubbed with defined grinding media and abrasion is determined by loss of weight or volume. Low abrasion values denote high resistance to wear.

COMPRESSION DEFORMATION

The residual deformation after sustained compressive deformation is measured by determining the compression set. (The test stoppers are deformed to a specific extent at defined temperatures and for defined periods.) Recovery is then determined. Low values denote low permanent set.

REBOUND RESILIENCE

Rebound resilience is measured with a falling hammer. The higher the rebound, the less energy is absorbed in the elastomer and converted into heat.