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Millathane® XP-9075

A *Polycarbonate* Polyurethane For Excellent Hydrolysis Resistance

Millathane XP-9075 is a new (***experimental***) polycarbonate grade of Millathane Millable Polyurethane Rubber developed for demanding applications requiring the utmost water and hydrolysis resistance while maintaining the excellent oil, heat and compression set resistance of polyester urethanes. Millathane XP-9075 does not require expensive carbodiimide stabilizers to achieve its excellent hydrolysis resistance, getting it instead from its stable polymer structure. Because of this, the hydrolysis resistance is permanent, unlike polyester urethanes using conventional hydrolysis stabilizers where the hydrolysis resistance lasts as long as the stabilizer remains unreacted.

Millathane XP-9075 is peroxide curable only, using typical rubber peroxides (e.g., dicumyl peroxide or DBPH).

The data below shows the much better hot water resistance of Millathane XP-9075 compared to a polyester polyurethane (Millathane 66 Premilled) that contains 1.5 phr of polymeric carbodiimide hydrolysis stabilizer. Substituting TAC for the SR350 in the formula gives improved oil and hot water resistance.

	8291-A	**8291-B**	**8291-C**
Millathane® 66 Premilled*	101.5	—	—
Millathane® XP-9075	—	**100.0**	**100.0**
Stearic acid	0.2	0.2	0.2
N330 Black	25.0	25.0	25.0
Struktol WB222	1.0	1.0	1.0
DiCup 40C	7.0	7.0	7.0
SR350 (TMPTMA, TRIM)	4.0	4.0	—
TAC (Triallyl Cyanurate)	—	—	2.0

*Contains 1.5 phr of Hydrolysis Stabilizer

Original properties			
Hardness, Shore A	70	73	73
TSE-100*, lb/in² (MPa)	475 (3.3)	445 (3.1)	505 (3.5)
Tensile Strength, lb/in² (MPa)	4530 (31)	4490 (31)	3400 (23)
Elongation,%	410	400	285
Tear Die C, lb/in (kN/m)	243 (43)	196 (34)	168 (29)
DIN Abrasion loss, mm³	56	45	52
Compression set, 22 hr/100°C	12	35	24

Heat aging, 70 hr/100°C			
Hardness change, Shore A	0	-1	-3
Tensile change, %	4	4	34
Elongation change, %	4	-10	11

Oil Aging, IRM903 Oil, 70 hr/100°C			
Hardness change, Shore A	-2	-3	-3
Tensile change, %	-8	-16	-4
Elongation change, %	-9	-19	-4
Volume change, %	0	6	5

Water Aging, 166 hr/100°C			
Hardness change, Shore A	-15	-3	-3
Tensile change, %	-55	-35	-4
Elongation change, %	23	1	11
Volume change, %	8	5	2