

Effect of Humidity on ADIPRENE[®] Vulcanizate Properties

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The effect of humidity on the properties of an ADIPRENE L 100, MBCA cured vulcanizate have been determined. The results are shown on the attached table. Samples were conditioned at room temperature for seven days at humidities ranging from 0 to 100 percent humidity.

- ◆ In general, modulus and tensile strength decrease with increasing humidity. If 60% humidity is used as a base, tensile strength will be cut in half when the humidity reaches 100%.
- ◆ Elongation at break is little affected by a changing humidity. Peak elongation is reached at about 60% humidity.
- ◆ Compression set increases with increasing humidity during low humidity changes. Once the humidity reaches 50%, little change occurs in the compression set.
- ◆ Resilience increases with increasing humidity. Peak resilience occurs at 100% humidity.
- ◆ Hardness decreases with increasing humidity. Normal or standard hardness occurs when the humidity is about 50-60%.
- ◆ Tear strength does not seem to be affected by changing humidity. There are, however, wide variations in the tear strength over the range of 0 to 100% humidity.

*Urethane
Prepolymers*

EFFECT OF HUMIDITY ON ADIPRENE VULCANIZATE PROPERTIES

COMPOUND

ADIPRENE L 100	100
MBCA	12.5

MIXING AND CURING

Mix Temperature, °C (°F)	71	(160)
Cure, Hours: °C (°F)	3:71	(160)
Post-Cure, hrs: °C (°F)	3:21	(3/70)

VULCANIZATE PROPERTIES

All samples conditioned 7 days at 21°C (70°F) at following humidities* before testing.

	0%	20%	40%	60%	80%	100%
100% Modulus, MPa (psi)	(1450)	(1350)	(1225)	(1200)	(1150)	(1100)
300% Modulus, MPa (psi)	(2625)	(2250)	(1900)	(1775)	(1650)	(1475)
Tensile Strength, MPa (psi)	(6350)	(5775)	(4600)	(4550)	(3450)	(2500)
Elongation at Break, %	470	480	480	505	490	460
Compression Set, Method B, %						
After 22 hours at 70°C (158°F)	27	30	32	33	33	33
Rebound Resilience, %	46	46	48	47	50	51
Hardness, Durometer A	92	—	—	90	—	88
Tear Strength, kN/m (lb./in.)						
ASTM D-470	101	96	82	96	98	85

* Test samples equilibrated in jars over following to effect proper humidity:

100% RH	Water
80%	Sat'd. ammonium chloride
60%	Sat'd. sodium bromide
40%	Sat'd. zinc nitrate
20%	Sat'd. potassium acetate
0%	Straight Drierite