

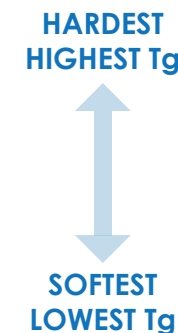
K-FLEX[®] Polyester Cast Elastomers

Mechanical Properties



In this study of mechanical properties, K-FLEX polyester diols were evaluated in a clear cast elastomer based on HDI cyclic aliphatic isocyanate trimer (NCO:OH 1.05:1.0). The results from King Industries' mechanical properties study are:

- K-FLEX XM-337** Highest tensile strength, most energy deflective, only product with a Young's modulus
- K-FLEX 188** Most versatile, balance of tensile strength, modulus and high Bayshore rebound
- K-FLEX XM-366** Good cost performance, similar properties to K-FLEX A308
- K-FLEX A308** Balance of good performance and low viscosity
- K-FLEX A307** Similar properties to PPG 400 and DEG adipate with lower NCO demand and better UV resistance
- K-FLEX XM-332** Lowest viscosity, most energy absorbing



All K-FLEX products have better compatibility with HDI cyclic isocyanate trimers than 1,4-butane diol and diethylene glycol adipate. K-FLEX polyesters in general have better exterior durability than other competitive technologies.

K-FLEX[®] TYPICAL MECHANICAL PROPERTIES VS COMPETITORS

Mechanical Properties	ASTM Method	Competitive Technology								
		<i>XM-337</i>	<i>188</i>	<i>XM-366</i>	<i>A308</i>	<i>A307</i>	<i>XM-332</i>	PPG 400	DEG Adipate	Tone [™] 0201 ³
Tensile Strength ¹ , psi	D412	4,200	3,100	1,700	2,100	790	780	660	860	640
Strain, %	D412	94	137	116	134	83	50	60	59	30
Shore Hardness	D2240	73 D	65 D	88 A	85 A	73 A	76 A	20 D	N/A ²	28 D
Bayshore Rebound	D2632	46	41	39	30	3	4	7	N/A	42
Tg, °C of Elastomer	AR-2000 Rheometer	45	30	19	12	-6	-8	N/A	N/A	N/A

¹Values measured at max ²N/A - Not available ³Tone[™] is a trademark of Dow Chemical Company

Diol Typical Property Comparison (all 100% active)

K-FLEX polyesters diols offer several advantages over typical raw materials used for 2K PU cold cast elastomer applications.

K-FLEX PROPERTY

- **Liquid at room temperature**
- **Low water content (<0.1%)**
- **Low color and refractive index**
- **No acid functionality**
- **Aliphatic, linear, saturated molecules**
- **Only primary hydroxyl groups**
- **Excellent compatibility**

ADVANTAGE

- Easy to handle
- Minimizes out gassing problems
- Ideal for optically clear systems
- No acid catalytic hydrolysis of cast polyester urethanes
- Excellent exterior durability
- Fast reactivity
- Compatibilizes otherwise incompatible materials

K-FLEX® TYPICAL PROPERTIES VS COMPETITORS

Typical Properties	XM-337	188	XM-366	A308	A307	XM-332	Competitive Technology		
							PPG 400	DEG Adipate	Tone™ 0201
Appearance	Clear	Clear	Clear	Light	Clear	Light	Light	Light	White waxy
Hydroxyl, Eq. wt.	260	244	208	216	400	212	200-234	249	265
Viscosity, cP @ 25°C	70,000	9,800	2,000	1,500	5,400	450	50-150	500	70 @ 55°C*
APHA Color	20	20	20	20	20	20	75 max	150 max	N/A
Refractive Index	1.4974	1.4927	1.4787	1.4810	1.4832	1.4672	1.4459	1.4696	1.4679

*Semisolid at room temp



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