

K-FLEX® & K-POL® POLYESTER DIOL RESINS

FORMULATION PI-13

King Industries, Inc. - Coatings Additives Division
 Science Road, Norwalk, CT 06852 - (203) 866-5551
 Fax: (203) 866-1268 Email: coatings@kingindustries.com



**ZERO VOC FILLED ALIPHATIC
 2K POLYURETHANE FLOOR COATING**

K-FLEX® and K-POL® polyester diol resin modifiers are recommended for 2K polyurethanes. Modification of this filled 100% non-volatile 2K polyurethane floor coating formulation demonstrates higher hardness, tensile strength, elongation, elastic modulus, tear strength, gasoline and transmission fluid resistance. K-FLEX/K-POL modifications partially replaced the polyether-polyester and linear polyether.

MATERIAL	DESCRIPTION	WEIGHT %	
		Control	K-FLEX/K-POL
Sovermol 750 ¹	Polyether/polyester polyol	25.05	21.59
Sovermol 1052 ²	Linear polyether polyol	10.74	7.42
K-FLEX/K-POL	Diol resin modifier	---	6.41
Efka SI 2008 ³	De-aerating agent	0.36	0.36
Barium sulfate	Filler	35.79	35.42
COMPONENT II			
Basonat HI-100 ⁴	Aliphatic Isocyanate Trimer	27.92	28.66
K-KAT 6212 ⁵	Catalyst	0.14	0.14
TOTAL		100.0	100.0

*K-KAT 6212⁵ could be added to the isocyanate component or as a third component.

FORMULATION CHARACTERISTICS				
	Control	K-FLEX XM-337 ⁶	K-FLEX 188 ⁷	K-POL 8211 ⁸
K-FLEX/K-POL, % on resin solids	---	10	10	10
Total resin solids, %	63.7	64.0	64.1	65.3
Filler/Binder	1.0	1.0	1.0	1.0
VOC, lbs./gal. (calc.)	0	0	0	0
NCO/OH	1.0	1.0	1.0	1.0

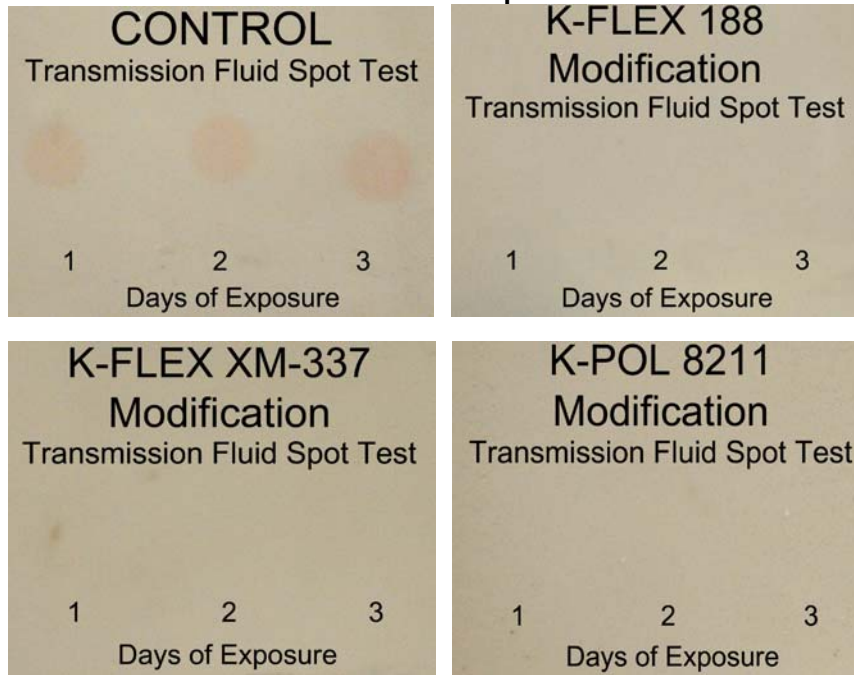
APPLICATION CONDITIONS	
Cure schedule	2 weeks ambient
Dry film thickness	~3 mm
Substrate	Polypropylene release mold

FILM PROPERTIES				
	Control	K-FLEX XM-337	K-FLEX 188	K-POL 8211
Shore D hardness	53	65	60	65
Mechanical Properties, Dogbones				
Tensile Strength, psi	1022	1440	1041	856
Elongation, %	40	63	50	55
Elastic modulus, psi	5951	10067	5013	6966
Tear strength, Die C				
Break/load, pli	43	86	76	110
Tensile Strength, psi	176	305	272	390
Abrasion resistance				
Taber abrasion, Wear Index* (C-17 wheel, 1,000 cycles)	56	54	39	53
Crockmeter, (0-10)*	6	1	3	3

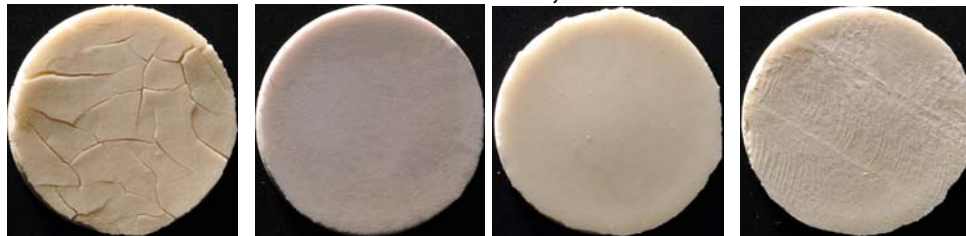
*Lower number indicates better abrasion resistance

CHEMICAL RESISTANCE				
	Control	K-FLEX XM-337	K-FLEX 188	K-POL 8211
16 Hour spot test				
Motor oil	Pass	Pass	Pass	Pass
Power steering fluid	Pass	Pass	Pass	Pass
Transmission fluid (Image next page)	Fail	Pass	Pass	Pass
Brake fluid	Pass	Pass	Pass	Pass
Immersion test (1" diameter disc - % diameter increase)				
Skydrol fluid (LD4), 210 hours	4.9	2.4	2.4	2.4
Gasoline (87 octane), 30 hours	7.3	9.6	7.1	8.7
Gasoline, Disc Degradation (Images next page)	Yes (Cracking)	No	No	No

Transmission fluid spot test



Gasoline immersion, 30 hours



Control

K-FLEX XM-337

K-FLEX 188

K-POL 8211

SUPPLIER REFERENCES

1.) BASF – Polyether/polyester polyol, 100% active, 179 g./eq. (as supplied)	5.) King Industries, Inc. – zirconium complex urethane catalyst – K-KAT 6212
2.) BASF – Linear polyether polyol, 100% active, 1025 g./eq. (as supplied)	6.) King Industries, Inc. – Polyester diol, 100% active, 230 g./ eq. – K-FLEX XM-337
3.) BASF Chemical Company - Deaerating agent – solution of modified silicone compounds	7.) King Industries, Inc. – Polyester diol, 100% active, 240 g./ eq. – K-FLEX 188
4.) BASF – Hexamethylenediisocyanate trimer, 100% solids, 191 g./eq. (as supplied)	8.) King Industries, Inc. – Polyester diol, 100% active, 143 g./ eq. - K-POL 8211

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