



2K PIGMENTED POLYURETHANE COATING

K-FLEX XM-366¹ is a mid-range T_g (-45°C) K-FLEX polyester polyol that is recommended as a modifying resin for isocyanate crosslinked coating systems. This formulation demonstrates the benefits of **K-FLEX XM-366** modification of a pigmented 2-component acrylic urethane coating. Significant improvements in flexibility and VOC are demonstrated in this study.

MATERIAL	DESCRIPTION	WEIGHT %
GRIND		
Joncryl 906 ²	Acrylic resin	15.64
Titanium Dioxide	Pigment	71.27
1-Methoxy-2-propanol acetate	Solvent	12.66
K-SPERSE® 152 ³	Dispersant	0.43
TOTAL		100.00

MATERIAL	DESCRIPTION	WEIGHT %	
COMPONENT I, LETDOWN	Component	Acrylic Control	XM-366 Modification
Grind	None	36.79	40.19
Joncryl 906	Acrylic resin	36.63	27.79
K-FLEX XM-366	Polyester resin	---	6.13
1-Methoxy-2-propanol acetate	Solvent	14.75	10.16
Byk 310 ⁴	Wetting Agent	0.10	0.10
Tinuvin 123 ⁵	Hindered amine light stabilizer	0.34	0.33
Tinuvin 1130 ⁶	UV absorber	1.03	1.00
DBTDL (10% in 1-Methoxy-2-propanol acetate)	Catalyst	0.10	0.10
COMPONENT II			
Desmodur N-3300 ⁷	Isocyanate resin	10.26	14.19
TOTAL		100.00	100.00

FORMULATION CHARACTERISTICS	Control	K-FLEX XM-366 Modification
Acrylic replacement, % by weight	0.0	20
K-FLEX XM-366, % on resin solids	0.0	13.7
Total solids, %	67.0	73.5
Total resin solids, %	40.8	44.9
Measured viscosity at 25°C, cP	600	600
VOC, lbs./gal. (calc.)	3.40	2.80
NCO/OH	1.04	1.04
% DBTDL on TRS	0.02	0.02

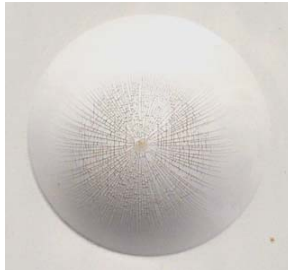
APPLICATION CONDITIONS	
Cure schedule	2 weeks ambient
Dry film thickness	1.0-1.1 mils
Substrate	Bonderite 1000 ⁸

FILM PROPERTIES	Control	K-FLEX XM-366 Modification
Surface dry, hours	6.0	6.7
Through dry, hours	12.5	11.0
Pendulum hardness, cycles	121	106
Pencil hardness	2-3H	H-2H
Double MEK rubs	100 mar	100+
Reverse impact, in-lbs	20-30	160+
Direct impact, in-lbs	90-100	160+
Crosshatch adhesion, %	100	100

APPLICATION CONDITIONS	
Cure schedule	30 minutes/80°C + 1 week ambient
Dry film thickness	1.0-1.1 mils
Substrate	Bonderite 1000 ⁸

FILM PROPERTIES	Control	K-FLEX XM-366 Modification
Pendulum hardness, cycles	119	109
Pencil hardness	H-2H	H-2H
Double MEK rubs	100 mar	100 slight mar
Reverse impact, in-lbs	<5	160+
Direct impact, in-lbs	30-40	160+
Crosshatch adhesion, %	100	100
Salt Spray, 100 hours, mm creep/blisters	6/7 med-den	5/6-7 med-den
QUV, 20° Gloss (Initial/1,000 hrs)	75/72	75/74
Humidity, 1,000 hrs	No attack	No attack

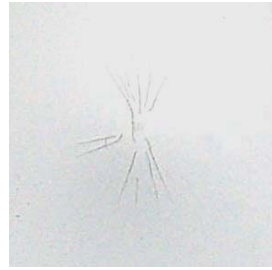
Reverse Impact Resistance



Failure
Control: 160 in-lbs



Failure (magnified)
Control: 160 in-lbs



Failure (magnified)
Control: 5 in-lbs



Pass
XM-366: 160 in-lbs

SUPPLIER REFERENCES	
1.) King Industries, Inc. – Polyester diol, 100% active, 208 g/eq.	6.) BASF Chemicals – Ultraviolet light absorber, 100% active
2.) BASF Resins – Acrylic polyol, 72% solids, 833 g./eq. (as supplied)	7.) Bayer Corp. – Hexamethylene diisocyanate trimer, 100% solids, 194 g./eq.
3.) King Industries, Inc. – Monomeric dispersant	8.) Henkel Corp., Parker Div. – Iron phosphated cold rolled steel
4.) Byk Chemie – Solution of a polyester modified polydimethylsiloxane	
5.) BASF Chemicals – Hindered aminoether light stabilizer, 100% active	
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