

## InChemRez<sup>®</sup> Phenoxy Resin Solutions InChemRez<sup>®</sup> PKHS<sup>®</sup>-40, & -30PMA

### Comparative Coatings Studies vs. EPONOL<sup>®</sup> 53 & EPONOL<sup>®</sup> 55

Clear thermosetting coatings formulations of InChemRez<sup>®</sup> PKHS<sup>®</sup>-40 and InChemRez<sup>®</sup> PKHS<sup>®</sup>-30PMA crosslinked with a conventional solvent borne melamine resin compare favorably with analogous formulations based on the EPONOL<sup>®</sup> line of high molecular weight solution epoxy resins.

Formulations at 28.6% solids having 20phr melamine resin crosslinker and 0.05% catalyst were prepared as shown below.

**TABLE 1**  
**MELAMINE CROSSLINKED CLEAR COAT FORMULATIONS**

Component:	Formulation			
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
InChemRez <sup>®</sup> PKHS <sup>®</sup> -30PMA:	100	-----	-----	-----
InChemRez <sup>®</sup> PKHS <sup>®</sup> -40:	-----	75	-----	-----
EPONOL <sup>®</sup> 53-BH-35:	-----	-----	100	-----
EPONOL <sup>®</sup> 55-BH-30:	-----	-----	-----	100
MEK:	-----	7.5	-----	-----
PGME:	-----	17.5	-----	-----
PM acetate:	20	20	40	20
CYMEL <sup>®</sup> 1158:	6.0	6.0	7.0	6.0
CYCAT <sup>®</sup> 296-9 (10% in PMA):	0.18	0.18	0.21	0.18
% solids (theor.):	28.6	28.6	28.6	28.6
Melamine resin phr:	20.0	20.0	20.0	20.0
Catalyst, wt. %:	0.05	0.05	0.05	0.05
MEK/PGME/PMA:	0/0/100	58/19/22	46/16/38	58/19/22
Appearance:	clear	clear	clear	clear
Viscosity, @ 25°C:	2284 cP	600 cP	288 cP	704 cP

Coatings were cast onto type "S" steel panels (Q-panel) using a 3.0 mil Bird type applicator and allowed to flash for 30 minutes. Panels were then baked 20 minutes at 170°C. Film properties are shown in Table 2.

**TABLE 2**  
**CLEAR COATINGS PROPERTIES**  
**(Bake Schedule: 20 minutes at 170°C)**

	<u>Formulation</u>			
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
Resin Solution:	PKHS®-30PMA	PKHS®-40	EPONOL® 53-BH-35	EPONOL® 55-BH-30
<u>Test Parameter:</u>				
Film thickness (mils):	0.65-0.85	0.70-1.00	0.55-0.80	0.60-0.85
Reverse impact (in-lb):	>160	>160	>160	>160
Crosshatch adhesion:	100%	100%	100%	100%
Sward hardness:	58	61	63	53
MEK double rubs:	p200	p200	f100	f80
Appear. (after MEK rubs):	glossy	glossy	N/A	N/A
Appearance after 30 minute spot tests:				
10% HCl:	N.E.	N.E.	N.E.	N.E.
10% sulfuric acid:	N.E.	N.E.	N.E.	N.E.
10% nitric acid:	N.E.	N.E.	N.E.	N.E.
5% acetic acid:	N.E.	N.E.	N.E.	N.E.
25% NaOH:	N.E.	N.E.	N.E.	N.E.
MEK:	s.dull.	soft.	dulled	dulled
isopropanol:	N.E.	N.E.	v.s.c.	s.c.
toluene:	N.E.	N.E.	N.E.	N.E.

v.s.c. = very slight crazing; p200 = passed 200 rubs; soft. = softening  
 N.E. = no effect; s.d. = slight dulling; s.c. = slight crazing

Based on the above results, equivalent and in some cases superior performance properties are obtained when formulations comprising InChemRez® Phenoxy resin solutions and a commercial melamine crosslinker are compared to the EPONOL® resin solutions.

InChemRez and PKHS are registered trademarks of InChem Corp.  
 EPONOL is a registered trademark of Resolution Performance Products  
 CYMEL and CYCAT are registered trademarks of Cytec Industries Inc.