

THE RHEOLOGICAL PROPERTIES CONTRIBUTED BY R-G244 ASBESTOS IN VISTRON POLYESTER-BASE RESIN J-379B

for

Vistron Corp., Silmar Division
Hawthorne, California

by

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OBJECTIVE

Investigation by Vistron Corporation has shown evidence of poor viscosity stability with the use of R-G244 Asbestos in their polyester-base resin J-379B. The purpose of this study was to determine optimum conditions for the utilization of R-G244 in this resin.

RESULTS

The poor performance of R-G244 in J-379B is attributed to the presence of cobalt naphthenate in the polyester which is detrimental to the surface bonding properties of R-G244. Results show that this may be overcome by the addition of a polar compound, such as ethylene glycol. A combination of 0.75 phr R-G244 and 0.3 phr ethylene glycol was effective for promoting the desired stable viscosity and thixotropy specified by Vistron Corporation.

DISCUSSION

Two gallons of J-379B type resin were supplied by Vistron Corporation for this evaluation. R-G244 was incorporated by mixing in a laboratory Homo-Mixer at 5000 rpm for 3 minutes. Viscosity measurements were obtained with a Brookfield Viscometer at 2 and 20 rpm and 25°C.

J-379B resin contains cobalt naphthenate, an accelerator commonly used in polyester systems. Cobalt naphthenate has adverse effects on the performance of most thixotropes, including R-G244 Asbestos. The exact mechanism is not well understood; however, the general opinion is that cobalt naphthenate reacts or is adsorbed on the surface of the particulates reducing their tendency to bond. A small addition of a polar material, such as ethylene glycol, has been found effective for promoting viscosity and thixotropy.

The thixotropic system specified by Vistron Corporation should have stable viscosities in the range of 1000 to 1600 cps at 2.5 rpm and 450 to 650 cps at 20 rpm. The rheological properties contributed by R-G244 in J-379B resin are illustrated in Table I. Nominal additions of ethylene glycol improved the viscosity and thixotropy of the R-G244 dispersion. Viscosity was found to remain relatively constant over a 5-week period; however, thixotropy decreased somewhat. It should be noted that viscosity at low shear was reasonably stable which is desirable for good antisag properties.

A combination of 0.75 phr R-G244 and 0.3 phr ethylene glycol most closely approximates the rheological properties specified by Vistron Corporation.

B. L. Ingalls/bsn
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Union Carbide trial exhibit UC-147: B. L. Ingalls and M. S. Kisiel, Rheological Properties Contributed by R-G244 As...
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TABLE I

Viscosity Stability of R-G244 Polyester Dispersions*

R-G244 phr	Ethylene Glycol phr	Initial Viscosity			Two Weeks			Five Weeks		
		2 rpm	20 rpm	Thix Index	2 rpm	20 rpm	Thix Index	2 rpm	20 rpm	Thix Index
0.75	-	800	560	1.4	900	780	1.2	975	640	1.5
0.75	0.15	800	460	1.7	1100	730	1.5	-	-	-
0.75	0.30	1600	630	2.5	1400	830	1.7	1500	1000	1.5

*Brookfield Viscosity (Centipoise) at 25°C

R-G244 mixed with Homo-Mixer for 3 min. at 5000 rpm

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The Rheological Properties Contributed by R-G244 Asbestos in Vistron Polyester-Base Resin J-379B

The attached report, "The Rheological Properties Contributed by R-G244 Asbestos in Vistron Polyester-Base Resin J-379B" by Ingalls and Kisiel presents a solution to the problem usually encountered in promoted thixotropic resin systems with any mineral thixotrope. The addition of small quantities of ethylene glycol overcomes the leveling effect on viscosity of the cobalt promoter.

This information should be of value in any polyester system containing cobalt compounds.

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