

The purpose of this study was to evaluate the comparative performance of *Isocryl® EP-550G* and Resin AG as gloss reduction agents in polyester/acrylic hybrid powder coatings.

PHYSICAL COMPARISON

<u>Property</u>	<u>Isocryl® EP-550G</u>	<u>Resin AG</u>
Appearance	water white granules	water white granules
Softening Point	120°C	133°C
Weight per epoxide	525	517
Specific Gravity	1.13	1.13

POWDER COATING EVALUATION

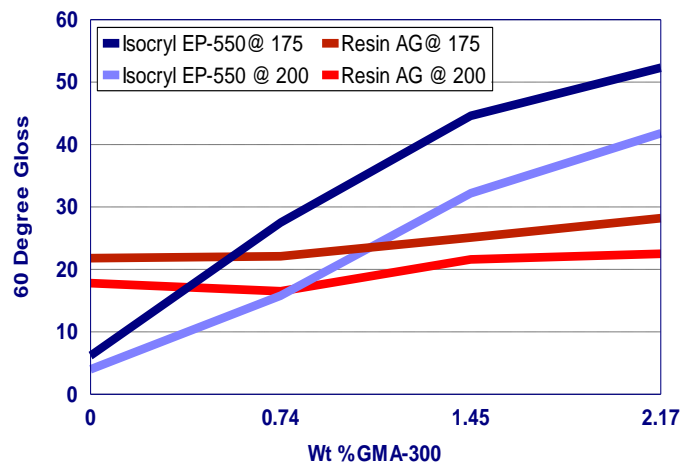
Powder coatings were made using the formulations below. The ingredients were pre-blended in a food processor, extruded in a single screw extruder with the first and second barrel temperatures set at 107°C and 113°C, respectively. The screw speed was set at 150 rpm. Following extrusion, the flaked material was milled in a Micropul Bantam Mill and screened through a 200-mesh screen. These powder coatings were electrostatically sprayed onto cold rolled steel panels and baked in a forced air electric oven.

FORMULATIONS

	1	2	3	4	5	6	7	8
7307.3	225	225	225	225	225	225	225	225
Isocryl® EP-550G	96		96		96		96	
Resin AG		96		96		96		96
Barium Sulfate	70	70	70	70	70	70	70	70
Carbon Black	1	1	1	1	1	1	1	1
Escat 22 (Estron)	10	10	10	10	10	10	10	10
GMA-300 (Estron)	-	-	3	3	6	6	9	9

RESULTS - GLOSS READINGS

The graph to the right illustrates the results from the attempts to produce powder coatings with varying degrees of gloss using Isocryl EP-550G or Resin AG, in combination with GMA-300. Gloss control is accomplished by varying the concentration of GMA-300, an Estron-produced glycidyl functional acrylic resin. The main finding is that identical formulations containing Isocryl EP-550G or Resin AG produce significantly different gloss levels. The data also show that GMA-300 can be used to effectively control gloss in certain polyester/acrylic hybrid powder coatings.



RESULTS - PHYSICAL PROPERTIES

There were no significant differences between the powder coatings prepared with *EP-550G* and Resin AG with respect to hardness, impact resistance, gel time or pill flows.

CONCLUSIONS

1. Using Isocryl EP-550G, it is possible to produce coatings with a 60° gloss reading in the very low, matte range (i.e. <10%). Resin AG did not produce any coatings with a 60° gloss of less than 15%.
2. Both products show similar gloss sensitivity to differences in bake temperature.
3. When used in conjunction with GMA-300 (manufactured by Estron), Isocryl EP-550G can be formulated to produce powder coatings within a wide gloss range (< 5% to >50%). The incorporation of GMA-300 with Resin AG has little or no effect on the resulting gloss. Thus, Resin AG does not offer the gloss formulation flexibility of EP-550G within the parameters of this study.
4. The use of Escat 22 dramatically improved the impact resistance of coatings made with both Isocryl EP-550G and Resin AG.
5. Identical formulations in which the two products were substituted for each other yielded substantially different gloss readings. The materials are therefore not interchangeable.

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