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EVALUATION OF 828-002 AND 828-004 PRIMER MODIFICATIONS IN
SPRA-CON FLOWCOATING EQUIPMENT

CHICAGO, ILLINOIS

On July 20-22, 1954, P-828-U-87568, White (828-002 vehicle) and P-828-U-87572, Light Yellow (high P/B low gloss modification of 828-004) flowcoating primers were evaluated in Spra-Con's production size flowcoater at Chicago. After the initial runs, both products were again evaluated when tinted to a light gray with 732-205 base. (Gray tint of P-828-U-87568 coded P-828-U-87576; Gray Tint of P-828-U-87572 coded P-828-U-87588). The following items were flowcoated during this evaluation: window air conditioner parts from International Harvester, laundromat parts from Westinghouse, basement window sash parts from Detroit Steel, and air conditioner parts from Ed. Freidrich, San Antonio. Mr. John Beckman, Engineer from International Harvester, witnessed our P-828-U-87576, Light Gray Primer, runs on 7/21/54. DuPont personnel present were as follows: J. F. Jarocki, R. O. Sellars, R. A. Sprout, and J. C. Bryan.

SUMMARY AND CONCLUSIONS:

(1) The performance of P-828-U-87568, White and P-828-U-87572 Light Yellow, in the Spra-Con flowcoater was considered satisfactory. As expected, the appearance of both light gray modifications was definitely superior to the white and light yellow primers (both primers exhibited some streaking and normal pull away from openings, but these conditions were not readily observable with the gray modifications).

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(2) Best results were obtained with P-828-U-87568 White (and P-828-U-87576 Gray) when reduced with Solvesso 150/Diacetone alcohol, 85/15, to a viscosity of 21"-22" #2 Zahn cup. Film thickness from 0.2-0.5 mils were obtained on vertical areas. (Our work indicated that slightly higher film thicknesses could be obtained by operating at higher viscosities and with slower reducing solvents). In general, performance of P-828-U-87576, Light Gray, seemed comparable with 828-003 Gray Primer (828-011 quality).

(3) Best results were obtained with P-828-U-87572, Light Yellow (and P-828-U-87588 Gray) when reduced with Panasol AN-3/Diacetone alcohol/Dowanol 62B, 60/20/20, to a viscosity of 24"-25" #2 Zahn. Film thicknesses of from 0.2-0.7 mils were obtained on vertical areas. In general, performance of P-828-U-87588 Gray seemed to be equal or superior to 828-004 Gray.

(4) The metal wetting properties of P-828-U-87576 Gray (828-002 quality) were somewhat better than P-828-U-87588 Gray (828-004 quality). This difference in wetting was particularly evident on rough basement window sash parts.

DETAILS:

On Tuesday (7/20/54) one drum of P-828-U-87568 (T-97783) was charged into the flowcoater mixing tank and thinned approximately 30% with Solvesso 100/diacetone alcohol, 75/25. A viscosity of 23" #2 Zahn at 85°F. was recorded. Initial runs with panels and Westinghouse parts (8-10 minutes flash in the solvent-laden atmosphere, 5 minutes air flash, 16 ft./min. chain speed, and 25 x 350°F. bake) indicated that improved performance (less shadow sagging) would be obtained if slower solvents were used. Accordingly, as solvent was needed to compensate for evaporation losses, additions of Solvesso 150 and diacetone alcohol were made. (Active solvent, diacetone alcohol, in the reduction thinner was maintained at a 15-20% level). Best results were obtained at 21'-22" #2 Zahn and operating conditions as shown above.

Tinting with 732-205 (T-954453), approximately 2 quarts 732-205 per 53 gallons P-764-U-87568, resulted in definitely improved appearance. Pull away from edges and bubble streaking was not as noticeable with the gray as with the white. Difficulties which are frequently apparent with flowcoating primers, such as crawling, poor flow on near horizontal areas, or bead blistering, were not present. Very slight silking and some black pigment floating developed on near horizontal areas, but these conditions were not serious. No pigment settling was noted after overnight standing of P-828-U-87568 Primer when reduced to 20" #2 Zahn.

On Wednesday (7/21/54) a variety of customer parts were flowcoated with P-828-U-87576 Gray. Operating conditions were as follows:

Thinner: Solvesso 150/diacetone alcohol 85/15
Viscosity: 21-22" #2 Zahn at 79-80°F.
Flash in Solvent Atmosphere: 6-9 minutes
Flash in Air: 5-10 minutes
Bake: 25' x 350°F.

The following customer parts were flowcoated:

(a) International Harvester air conditioner parts. Several of these parts were primed with a two-coat, two-bake system. International Harvester plans to conduct salt spray, humidity and field performance tests on these parts. A portion of the two-coat, two-bake parts will be tested without 752-Line topcoat; all single primer parts will be tested with topcoat enamel. Primer film thicknesses of 0.2-0.4 mils per coat were obtained and appearance was considered good.

(b) Westinghouse laundromat parts. These parts were given a single primer coat (film thickness 0.2-0.4 mils) and will be returned to Westinghouse for testing.

(c) Detroit Steel basement window sash parts. Very rough metal was used in the construction of these parts. A single primer coat was applied, and all parts were returned to Detroit Steel for humidity cabinet testing; a topcoat enamel will not be applied. Film thickness of approximately 0.3-0.5 mils was obtained and metal wetting was considered excellent.

(d) Ed. Freidrich air conditioner parts. All parts were flowcoated and returned to this customer for testing. Film thicknesses of 0.2-0.4 mil were obtained. The appearance level of these parts was not as good as would be expected if improved hanging techniques were employed; only a few parts of each type were available, and we were unable to adequately evaluate different hanging methods.

On Thursday (7/22/54) one drum of P-828-U-87572, Light Yellow, (T-953113) was charged in the flowcoater and thinned to 20" #2 Zahn at 78°F. with Panasol AN-3/diacetone alcohol/butyl carbitol, 56/22/22. Initial runs with panels and Westinghouse laundromat parts (8-10 minutes flash in solvent-laden atmosphere, 5-6 minutes air flash, 16 ft./minute chain speed and 20 x 400°F. bake) demonstrated that the light yellow modification will not return a high level of appearance (pull away from edges and bubble streaking were observed).

Accordingly, 2 quarts of 732-205 were added to obtain a light gray modification (P-828-U-87588 code assigned 7/29/54). The

light gray runs were conducted at higher viscosity (22"-23" #2 Zahn at 80°F.) and appearance was definitely improved. Very slight crawling, bead bubbling and pigment flooding was noted, but no silking was encountered; film thicknesses of 0.2-0.6 mils were obtained on Westinghouse parts.

In our final runs, P-828-U-87572 was charged in the flow-coater, tinted to obtain P-828-U-87588 Light Gray, and thinned to 24" #2 Zahn at 81°F. with Panasol AN-3/diacetone alcohol/Dowanol 62-B, 60/20/20. Operating conditions were maintained as described above, and excellent performance was obtained over Westinghouse parts (high film thicknesses, 0.3-0.7 mils were obtained). It appeared that slightly more bubbling occurred with this solvent combination than with the butyl carbitol containing solvent; silking and flooding were nil in both cases. P-828-U-87588 did not wet the surface of Detroit Steel window sash parts as well as P-828-U-87576. (Black pigment floating in the mixing tank was more pronounced with the 828-002 quality than with the 828-004 quality).

Solvents used during these runs were as follows:

Panasol AN-3	T-8511 (T-954610)
Butyl Carbitol	T-8721 (T-951575)
Dowanol 62-B	TTX-23935 (T-954574)
Diacetone Alcohol	T-8746 (T-989356)
Solvesso 150	T-8844 (C-956249)
Solvesso 100	T-8843 (C-945248)

SALES DEVELOPMENT


J.C. BRYAN

JCB:ELM
8/5/54