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Report #960913 consultants in the chemistry and technology of surface coatings

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Z.R.C. Products Co., Inc.
21 Newport Avenue
Quincy, MA 02171

ATTN: Mr. Steven Collins

RE: Effective Marginal Drying Conditions on Z.R.C. Cold Galvanizing
Compound

Gentlemen,

We have examined the drying time characteristics of Z.R.C. Cold Galvanizing Compounds under temperature conditions below ambient. The tests were performed for touch dry (ASTM D-1640-83 Paragraph 7.2) and for dry to handle (ASTM D-1640-83 Paragraph 7.7) on films cast onto small cold rolled steel Q-panels at 3.5 ± 0.25 dry mils using a doctor blade with an 11.5 mil clearance. Dry times were performed in an open refrigerator, panels being placed at various distances from the open doorway and from the source of refrigeration; and temperatures being monitored at all discrete locations with a mercury thermometer.

The results may be reviewed in Figure 1. All points on these graphs represent average dry times obtained from films on diverse panels in repeated experiments but should be considered approximate only. Drying times at each temperature were found to vary with film thickness, being fastest where film thicknesses were lowest, and slowest on panels of highest film thickness. Spray application, application in high winds, both of which conditions foster faster solvent release from the coating, will in practice tend to shorten the times required for a given degree of drying (especially touch drying), at any given film thickness and temperature.

While the observed films represent dry to touch and dry to handle temperatures, through drying oxidation times and dry times to recoat will be somewhat longer, and recoating with high barrier systems (such as aluminum pigmented finish coats), which will reduce oxygen access to the lower film layers (especially where finish coats are based on polymers having low oxygen transmission rates) may lead to excessively extended recoating time requirements. Insufficiencies in the cohesion of newly applied Z.R.C. films recoated with this type of finish too rapidly, especially in thicker films or films applied at low temperature, can produce zinc splitting problems. This will become particularly problematic as film thicknesses of finish coats are maximized. For these reasons we would stress the importance of careful consideration of **all factors** when any application and recoating of Z.R.C. is performed outside the recommended practice protocol.

Many of the drying temperatures noted in the above work are well below the minimum application temperatures recommended for Z.R.C. While low temperature application is not necessarily detrimental in itself (given sufficient time to allow through drying), the rapid recoating of films so applied must always be avoided and the inadvisability of such practice should be re-emphasized to all potential customers.

Yours Sincerely,

Clive H. Hare, Inc.

Clive H. Hare,
President

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**Figure 1:- Effects of Temperature on Dry Times
Of Z.R.C. at 3.5 mils DFT**

