CVC Thermoset Specialties	Technical Service Report	#TS090116

CTBN Modified Hybrid Powder Coating

CTBN was employed in the scheme of epoxy-polyester powder coating to feature excellent gravelometer or chip resistance. Elastomer (CTBN) modified chip resistant coating had superior properties to liquid polyurethane anti-chip coatings. [(1)]

Adduct A

	Parts by Weight
CTBN 1300x8	500
Bisphenol A	500
Diglycidyl Ether of Bisphenol A (EEW-190)	1450
Ethyltriphenylphosphonium iodide	0.8
Time/Temperature, Hours/^{o}C	1.5/160
Final Epoxy Equivalent Weight (EEW)	1035

Powder Formulation

Adduct A	1035
Carboxyl Functional Polyester*	1058
Benzoin	17
Modaflow III Flow Control Agent	29
Barium Sulfate	327
Titanium Dioxide	171
Carbon Black	5

* DSM's P2230, Acid Number 48-58, Mn-2180

Film Properties

Substrate: Zinc phosphatized steel having a layer of an electrodeposition coating

Film Thickness, Mils	4-9
Chip Resistance*	10
10-Day Humidity**	Pass
Salt Spray***	No Creepage
Cycle Test****	Pass

Note: Panel was topcoated with an acrylic/melamine basecoat of 0.4 mils and an acrylic/melamine clearcoat of 1.8 mils.

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* Determined by subjecting five pints of small gravel stones at 60-70 psi at 90^{o}C incident angle onto coated panel which had been chilled for one hour at -10^{o}F (-23^{o}C); visual rating with larger number indicating less chipping.

** Panels subjected to gravelometer testing were placed into a chamber at 100% relative humidity and 38^{o}C for 10 days. Pass rating means no rust or blistering.

*** ASTM B117-73

**** Panels subjected to gravelometer testing were passed through 15 cycles of following sequence: 24 hours at 100% relative humidity, 20 hours at -23^{o}C and 4 hours at room temperature (25^{o}C). Examined for mud cracks.

(1) U.S. Patent 4,804,581