

Carboset[®] CR-795

Acrylic Polymer

Lubrizol

TECHNICAL DATA SHEET

DESCRIPTION

Carboset[®] CR-795 is a thermoplastic acrylic emulsion designed to provide an excellent balance of gloss and adhesion to various metal and non-metal substrates, as well as excellent corrosion protection. **Carboset CR-795** resin can also be formulated to provide very good application properties, such as flow and leveling, for good brushability and spray applications. Finished paints provide good overall properties of gloss, color retention, and general chemical and stain resistance. **Carboset CR-795** resin is readily coalesced with traditionally used glycol ethers and capable of low VOC formulating, and is recommended for both topcoat DTM and primer applications.

SUGGESTED APPLICATIONS

- Industrial Finishes for Metal
- Maintenance Topcoats and Primers
- DTM Gloss and Semi-Gloss Enamels

PERFORMANCE FEATURES

- Very good corrosion resistance
- Good stain resistance
- Excellent water and humidity resistance
- Excellent adhesion to metal, plastic, wood and masonry surfaces

PHYSICAL PROPERTIES*

Appearance	Milky White Emulsion
Total Solids by Weight, %	45.0
Total Solids by Volume, %	43.3
Density, pounds/gallon	8.6
Specific Gravity	1.03
Brookfield Viscosity, 25°C, #2 Spindle, cps	75
pH	8.3
MFFT, °C	24°C
Freeze/Thaw Stability	Protect from Freezing

*Property values represent typical results only and are not to be considered specifications.

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TYPICAL PERFORMANCE DATA

WHITE GLOSS DTM SPRAY ENAMEL
(Model Formula CR-795-02A and CR-795-02B)

Dry Film Thickness: 1.5 mils Cure: Air Dry, Time as Noted Substrate: B 1000 (unless otherwise noted)

(B 1000 panel should be wiped with damp cloth, dried, then wiped with MEK or acetone prior to application of coating.)

Test Results Test	CR-795-02A		CR-795-02B	
	1 Day	7 Day	1 Day	7 Day
1. Gloss, 60°/20°	83/64	84/65	80/59	82/61
2. Hardness (Set-to-Touch = 15 min.)				
• Pencil Hardness	<4B	<4B	<4B	<4B
• Konig Hardness	11	15	15	23
• Persoz Hardness	24	33	35	35
3. Crosshatch Adhesion				
• On CRS	5B	5B	5B	5B
• On Aluminum	5B	5B	5B	5B
• On Bonderite 1000	5B	5B	5B	5B
• On Zinc Hot Dipped Galvanized	5B	5B	5B	5B
• On Zinc Electro Galvanized	5B	5B	5B	5B
• On Zinc/Iron Hot Dipped Galvanized	3B	5B	3B	5B
• On Zinc/Iron Electro Galvanized	4B	5B	3B	5B

TYPICAL PERFORMANCE DATA

COMPARATIVE TEST RESULTS
WHITE HIGH GLOSS DTM BRUSHING ENAMELS
CARBOSET CR-795-02A & 02B VS. COMPETITIVE LATEX

Dry Film Thickness: 1.5 mils Cure: Air Dry, Time as Noted

Substrate: B 1000

Test	<u>Carboset CR-795-02A</u>		<u>Leading Competitive Latex</u>	
	1 Day	7 Day	1 Day	7 Day
1. Gloss: 60°/20°	83/64	84/65	89/76	92/83
2. Hardness: Konig, sec.	11	15	14	24
3. Hardness: Persoz, sec.	24	33	32	53
4. Adhesion: Crosshatch	5B	5B	3B	4B
5. Conical Mandrel	Pass, 1/8"	Pass, 1/8"	Pass, 1/8"	Pass, 1/8"
6. Salt Fog: 250 Hr. 7 Day Dry				
Field:		Excellent		#2 Few
Scribe Creep:		0.75 mm		8 mm
Scribe Blisters:		#8 Medium		peeled

Test	<u>Carboset CR-795-02B</u>		<u>Leading Competitive Low VOC Latex</u>	
	1 Day	7 Day	1 Day	7 Day
1. Gloss: 60°/20°	80/59	82/61	76/51	77/52
2. Hardness: Konig, sec.	15	23	18	25
3. Hardness: Persoz, sec.	35	56	40	56
4. Adhesion: Crosshatch	5B	5B	4B	4B
5. Conical Mandrel	Pass, 1/8"	Pass, 1/8"	Pass, 1/8"	Pass, 1/8"
6. Salt Fog: 250 Hr. 7 Day Dry				
Field:		Excellent		#4 Few
Scribe Creep:		0.75 mm		1.0 mm
Scribe Blisters:		#6 Medium		#6 Medium

FORMULATION

WHITE GLOSS DTM SPRAY ENAMEL
Model Formula CR-795-02A

<u>Material</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Use</u>
Charge to Letdown tank			
Ti-Pure R-746	270.8	14.0	TiO2 Slurry
Solsperse® 46000	13.9	1.5	Dispersant
Premix next three items before adding to above with agitation			
Water	32.5	3.9	
Texanol™	42.3	5.4	Cosolvent
Ektasolve DP	24.1	3.0	Cosolvent
Add the following five items under agitation			
AMP-95™	1.0	0.1	Amine
Byk® 028	0.7	0.08	Defoamer
Carboset® CR-795	610.5	71.0	Acrylic Emulsion
Byk 028	1.2	0.1	Defoamer
Raybo 60	<u>9.1</u>	<u>1.0</u>	Flash Rust Inhibitor
	1006.0	100.0	

Total Solids by Weight, %	49.6
Total Solids by Volume, %	39.1
Weight per Gallon, lbs.	10.1
VOC, grams/liter	169.0
pounds/gallon	1.4
P. V. C., %	17.1
pH	8.5

FORMULATION

WHITE GLOSS LOW VOC DTM SPRAY ENAMEL
Model Formula CR-795-02B

<u>Material</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Use</u>
Charge to Letdown tank			
Carboset® CR-795 resin	639.9	74.4	Acrylic Emulsion
Ammonia, 28%	2.3	0.3	pH Adjustment
BYK 028	1.2	0.1	Defoamer
Allow 15 minute mix before adding next four ingredients			
Water	66.4	8.0	
KP-140®	4.9	0.6	Plasticizer
Dowanol™ DPnB	19.0	2.5	Cosolvent
Dowanol TPM	15.6	1.9	Cosolvent
In a separate tank, high speed disperse the following to a 7 Hegman, then add to letdown tank			
Water	43.7	5.3	
AMP-95™	1.0	0.1	Amine
Solsperse® 46000	5.3	0.6	Dispersant
Kronos® 2310	171.6	5.2	TiO2 Pigment
Then add:			
Raybo 60	<u>8.9</u>	<u>1.0</u>	Flash Rust Inhibitor
	979.8	100.0	
Total Solids by Weight, %	47.9		
Total Solids by Volume, %	38.7		
Weight per Gallon, lbs.	9.8		
VOC, grams/liter	98.9		
pounds/gallon	0.8		
P. V. C., %	14.0		
pH	8.5		

FORMULATION SUGGESTIONS AND RAW MATERIAL INFORMATION

COALESCING

To effectively lower the minimum film forming temperature to produce a continuous film, the use of coalescents is required. **Carboset® CR-795** resin responds well to various ethylene and propylene based glycol ethers and blends.

For spray applied Industrial Finishes, a recommended starting point level when coalescing with glycol ether solvents is 12 - 25% on polymer solids. Temperature, humidity and efficiency of coalescent may alter the choice of solvent and the necessary level. In some cases it may also be desirable to use plasticizers to reduce coalescent levels.

Characteristics of the coating such as dry time, hardness development, VOC, as well as coating performance, can vary with the selection of different coalescents. It is most efficient to first look at coalescing the unpigmented polymer to achieve a clear continuous film at the desired film formation temperature.

Reduction in the minimum film forming temperature can also be achieved with the use of coalescing solvents with plasticizers. Use of plasticizers will allow the formulator to further reduce the VOC of the final coating.

For **Brushing Enamels**, a blend of two cosolvents is generally used. A fast evaporating, water miscible cosolvent is used to increase wet edge and improve freeze/thaw stability. For direct to metal applications, ethylene or propylene glycol should not be used because they tend to promote flash rusting. Dowanol™ DM avoids this situation without imparting an offensive odor to the coating. Glycol ether DPM can also be used, however hardness development will be slower.

DEFOAMERS

In order to reduce foam during manufacturing and during application, it may be necessary to use a defoamer. Commercial defoamers that have demonstrated effectiveness are:

Byk® 028	Byk Chemie
Byk 024	Byk Chemie
Byketol® WS	Byk Chemie
Tego® Foamex 822	Tego-Chemie

VISCOSITY AND RHEOLOGY CONTROL

For DIY and DTM Brushing Enamels, associative thickeners are suggested to obtain alkyd-like flow without excessive sagging at a reasonable brushing viscosity. These properties can be easily achieved with Rheolate® 350. The resulting paint will not show clear liquid separation upon shelf-aging or viscosity drift during heat-aging. For some **Industrial Finishes**, additional external rheology modifiers may be necessary.

Rheolate 350	Rheox
DSX-1514	Henkel
DSX-1550	Henkel

DISPERSANTS

Solsperse® 46000 can be used as an optional pigment dispersant to provide high gloss. Additionally the formulator may be able to decrease the need for other formula surfactants, which can contribute to increased water resistance.

OTHER RAW MATERIALS

Solsperse® 46000	Lubrizol
Byk® 156	Byk-Chemie
Triton® CF-10	Union Carbide
Ammonium Benzoate	Caschem
Kronos® 2310	Kronos, Inc.
Raybo 60	Raybo Chemical Co.
AMP 95™	Angus