UNION CARBIDE COATINGS MATERIALS

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VINYL-COAL TAR COATINGS

PLAINTIFF'S EXHIBIT UC-390

PRELIMINARY APPLICATION INFORMATION

RECEIVED NOV 17 1975

VINYL-COAL TAR COATINGS

Coal tar has been established firmly as a valuable paint ingredient because of its outstanding water impermeability and chemical inertness. However, its brittleness and tendency to alligatoring upon weathering make it necessary to modify coal tar with other resins in order to improve its performance. Vinyl resins are ideal modifiers for coal tar because of their excellent mechanical and weathering properties as well as water and chemical resistance. Resulting coatings possess excellent adhesion properties, even to poorly prepared, partly rusted substrates. In addition, such modifications remain one-package systems.

Vinyl-coat tar coatings are not new; commercially-available products have protected many ships and steel structures over the years. However, recent emphasis on high-build formulation has placed additional interest in this type of paint since it enables the applicator to complete the job in few coats. Formula VP-3726, attached, is an example of this type of coating.

Combination of coal tar and epoxy resins have become accepted in a number of applications such as shipbottom primers and pipe coatings. One of the most severe problems confronting users of epoxy-coal tars is that their crosslinking nature results in a surface difficult to topcoat because of solvent insensitivity. This is particularly so in epoxy-coal tar primers for antifouling topcoats. Even if the initial topcoating is accomplished successfully, when the ship needs a refresher coat of antifouling paint, recoating is risky unless the complete system is removed and repainted.

Vinyl modification of epoxy-coal tars gives these coatings increased versatility because it improves their topcoat receptivity, even after long-term service. Formula Suggestion VP-3727 is an example of a vinyl-epoxy-coal tar primer. Laboratory tests show the excellent adhesion of these primers to antifouling topcoats (such as Formula Suggestion VP-3634), even after accelerated aging.

October, 1975
F-45652

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FORMULA SUGGESTION VP-3726

HIGH-BUILD VINYL-COAL TAR PRIMER
BAKELITE® VINYL RESIN VMCC

Ingredients	Pounds Per 100 Gallons	Gallons Per 100 Gallons	Percent By Weight
BAKELITE Vinyl Resin VMCC	133.1	12.0	12.8
CELLOSOLVE Acetate	310.4	38.3	29.7
Methyl Ethyl Ketone (MEK)	102.0	15.2	9.8
Xylene	31.0	4.3	3.0
Coal Tar[1]	133.0	13.1	12.8
Diisodecyl Phthalate	33.3	4.1	3.2
Talc	295.6	12.8	28.4
Thixotropic Agent[2]	3.6	0.2	0.3
Total	1042.0	100.0	100.0

Suppliers:

1. Coal Tar—"Refined Pitch" K-374 (Koppers Co.) or equivalent.
2. Thixotropic Agent—"Cab-O-Sil" M-5 (Cabot Corp.) or equivalent.

Preparation:

Dissolve VMCC in a mixture of MEK, xylene and half the CELLOSOLVE Acetate. Separately, melt the coal tar to about 180°C. While mixing continuously, allow to cool to about 130°C and then add slowly the remainder of CELLOSOLVE Acetate. Pour the coal tar solution into the VMCC solution slowly and with constant agitation. Add the remaining ingredients to the millbase, stir until homogeneous and grind to Hegman 5+ in sand grinder or pebble mill.

Constants:

Pigment Volume Concentration (PVC)	31%
Nonvolatiles by Weight	57.5%
Nonvolatiles by Volume	42%
One-mil Coverage	676 sq. ft./gallon

Typical Properties:

Weight per Gallon	10.4 lb
Specific Gravity	1.25 g/cc
Viscosity:	
Brookfield, 2 rpm	40,000 cP
Stormer	102 KU
Brushometer	370 cP

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FORMULA SUGGESTION VP-3726

Application:

No thinning required. Use a 26:1 (or higher) ratio airless spray unit such as DeVilbiss QH-504, 100 psi input pressure, JGB-501 gun with 18-65 nozzle.

Performance:

System:	Substrate: Sandblasted steel Primer: VP-3726, 5 mils dry in one coat Topcoat: VP-3634, 5 mils dry in one coat
Salt Spray:	1000 hours No blistering No corrosion
Seawater Immersion (New Jersey) — one year	
	No blistering No corrosion

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FORMULA SUGGESTION VP-3727

HIGH-BUILD VINYL-EPOXY-COAL TAR PRIMER
BAKELITE® VINYL RESIN VMCC

	Pounds Per 100 Gallons	Gallons Per 100 Gallons	Percent By Weight
BAKELITE Vinyl Resin VMCC	92.4	8.2	8.8
CELLOSOLVE Acetate	296.3	36.6	28.4
Methyl Ethyl Ketone (MEK)	97.3	14.5	9.3
Xylene	29.6	4.1	2.8
Coal Tar[1]	92.4	9.1	8.8
Polyamide Resin[2]	31.0	3.8	3.0
Diisodecyl Phthalate	23.0	2.9	2.2
Talc	311.2	13.5	29.8
Accelerator[3]	4.1	0.6	0.4
Thixotropic Agent[4]	6.1	0.3	0.6
Package separately:			
Epoxy Resin[5]	61.4	6.4	5.9
Total	1044.8	100.0	100.0

Suppliers:

1. Coal Tar – "Refined Pitch" K-374 (Koppers Co.) or equivalent.
2. Polyamide Resin – "Versamid" 125 (General Mills Co.) or equivalent.
3. Accelerator – "DMP-30" (Rohm and Haas Co.) or equivalent.
4. Thixotropic Agent – "Cab-O-Sil" M-5 (Cabot Corp.) or equivalent.
5. Epoxy Resin – "Epon" 815 (Shell Co.) or equivalent.

Preparation:

Dissolve VMCC in a mixture of MEK, xylene and half the CELLOSOLVE Acetate. Separately, melt the coal tar to about 180°C. While mixing continuously, allow to cool to about 130°C and then add slowly the remainder of CELLOSOLVE Acetate. Pour the coal tar solution into the VMCC solution slowly and with constant agitation. Add the remaining ingredients to the millbase, stir until homogeneous and grind to Hegman 5+ in sand grinder or pebble mill. Package the epoxy resin separately.

Constants:

Pigment Volume Concentration (PVC) 31%
Nonvolatiles by Weight 60%
Nonvolatiles by Volume 44%
One-mil Coverage . . . . . 710 sq. ft./gallon

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FORMULA SUGGESTION VP-3727

Typical Properties:

Weight per Gallon	10.5 lb
Specific Gravity	1.25 g/cc
Viscosity:	
Brookfield, 2 rpm	45,000 cP
Stormer	98 KU
Brushometer	340 cP

Application:

No thinning required. Use a 26:1 (or higher) ratio airless spray unit such as DeVilbiss QH-504, 100 psi input pressure, JGB-501 gun with 18-65 nozzle.

Performance:

System:	Substrate: Sandblasted steel Primer: VP-3726, 5 mils dry in one coat Topcoat: VP-3634, 5 mils dry in one coat
Salt Spray:	1000 hours No blistering No corrosion
Seawater Immersion (New Jersey) — one year.	
	No blistering No corrosion

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