



Paint & Paper Department

No. 502

Industrial Maintenance Coatings Formulary

ACTIV-8[®] Drier, Stabilizer and Accelerator is a solution of 1,10-phenanthroline, a chelating agent for metals. **ACTIV-8** acts as drier accelerator and stabilizer when used with cobalt and/ or manganese driers in paints and coatings based on oleoresinous binders. A ratio of 10 parts of **ACTIV-8** to 1 part of drier metal is most often used in solvent-borne coatings. **ACTIV-8** does not affect the activity of the other commonly used drier metals. **ACTIV-8** is used in combination with manganese and/ or cobalt driers in coatings that cure by oxidative polymerization. In general, **ACTIV-8** is used with manganese and cobalt in solvent-borne coatings. The surface drying activity of manganese is accelerated to a much greater degree than that of cobalt. The activity with cobalt improves through dry and long term aging stability, especially in waterborne coatings where loss of dry often occurs.

DARVAN[®] 7-N Dispersant is a sodium polymethacrylate, a clear to slightly opalescent colorless liquid. It shows very little tendency to foam. It is used as a dispersant for minerals and pigments in the dispersion portion of manufacture of water based paints and coatings.

DARVAN C-N Dispersant is an ammonium polyacrylate dispersing agent for minerals and extenders for water-based paints. **DARVAN C-N** has good zinc oxide stability and inhibits gel formation.

VANSIL[®] W Wollastonite is a calcium metasilicate mineral, available in five grades of fineness to meet the requirements of the coatings industry. Each grade exhibits a lower viscosity in paint than is indicated by its oil absorption value. The relatively high pH (10-11) of **VANSIL W** is particularly useful in maintaining the desired alkaline pH level of latex paints and preventing the early rusting of latex maintenance coatings. **VANSIL W** is an excellent extender pigment for powder coatings as well as solvent-thinned and latex paints. **VANSIL W-50** disperses to a 6 to 7 Hegman fineness at three pounds per gallon. This grade is suitable for liquid industrial and corrosion resistant coatings, powder coatings, and semi-gloss architectural coatings. In powder coatings, this grade is desirable for smoother films and improved gloss.

ACTIV-8 Drier, Stabilizer and Accelerator, **DARVAN** Dispersant and **VANSIL** Wollastonite are registered trademarks of R.T. Vanderbilt Holding Company, Inc. and/or its respective wholly owned subsidiaries.

rev09/10/2013

Formula 081501
Water-Reducible Alkyd/Acrylic Latex Direct To Metal Primer
VANSIL® W-50¹ Wollastonite, ACTIV-8®¹ Drier, Stabilizer and Accelerator

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Kelsol® 3961-B2G-75 ²	65.6	7.5	7.87	7.49
Arcosolv® DPM ³	28.1	4.0	3.37	3.95
<i>Preblend the next four items and add.</i>				
Arcosolv® DPM	23.4	3.3	2.81	3.29
Arcosolv® PM Acetate ³	4.7	0.6	0.56	0.58
ACTIV-8¹ Drier, Stabilizer and Accelerator	0.4	0.0	0.04	0.05
Cobalt Hydrocure® II ⁴	1.5	0.2	0.18	0.20
Ti-Pure® R 900 ⁵	46.8	1.4	5.62	1.41
VANSIL W-50¹ Wollastonite	76.1	3.1	9.13	3.15
Halox® SW 111 ⁶	74.9	3.1	9.00	3.14
<i>Disperse at high speed for 20 minutes.</i>				
<i>Reduce speed and add:</i>				
AMP-95® ⁷	1.9	0.2	0.23	0.24
Water	57.5	6.9	6.74	6.74
<i>Measure pH and adjust to 8.0 to 8.5 with AMP-95.</i>				
<i>Mix at slow speed for 5 minutes.</i>				
LET DOWN				
2.5% Cellosize® QP 4400 ⁸	131.2	15.7	15.74	15.74
<i>Mix at medium speed for 5 minutes.</i>				
NeoCryl® 6085 Latex ⁹	468.4	54.0	56.20	54.03
<i>Mix at slow speed for 10 minutes.</i>				
TOTALS	980.5	100.0	117.49	100.01
PAINT PROPERTIES				
Density	9.8 lbs/gal		1.17 g/ml	
% Solids by weight	44.8			
% Solids by volume	33.4			
% PVC	23			
Pigment to binder ratio	0.82:1			
Calculated VOC	1.72 lbs/gal		205 g/l	

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold, Inc., Research Triangle Park, NC

³Lyondell Chemical Company, Rotterdam, The Netherlands

⁴OM Group, Inc., Cleveland, OH

⁵E.I. DuPont de Nemours & Company, Wilmington, DE

⁶Halox Pigments, Hammond, IN

⁷Angus Chemical Company, Buffalo Grove, IL

⁸Dow Chemical Company, Midland, MI

⁹AstraZeneca Pharmaceuticals LP, Wilmington, DE

TRADEMARKS

Registered and pending trademarks appearing printed in bold in these materials are those of Vanderbilt Minerals, LLC. For a complete listing, please visit

http://www.vanderbiltminerals.com/ee_content/Documents/Technical/Trademarks_VM_Web.pdf

AMP-95 is a registered trademark of Angus Chemical Company.

Acrysol is a registered trademark of Rohm & Haas Company.

Cellosize is a registered trademark of Union Carbide Chemicals & Plastics Technology Corporation.

Cobalt Hydrocure is a registered trademark of OM Group, Inc.

Halox is a registered trademark of Halox Pigments.

Kelsol is a registered trademark of Reichhold Chemical, Inc.

NeoCryl is a registered trademark of DSM NeoResins B.V.

Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

Rev02/19/2013

Formula 082101
2K Water-borne Epoxy Fast Dry Shop Primer
VANSIL® W-50¹ Wollastonite

	Pounds	Gallons	Kilograms	Liters
PART A				
Epi-Rez® 5522-WY-55 ²	334.3	37.1	40.12	37.14
Diacetone Alcohol	7.3	0.9	0.87	0.92
Rhodoline® 640 ³	3.6	0.4	0.44	0.43
Water	60.8	7.3	7.30	7.30
Mapico® 214 M ⁴	72.1	1.7	8.65	1.73
Barytes	72.1	1.9	8.65	1.92
VANSIL W-50¹ Wollastonite	107.9	4.5	12.95	4.47
Moly-White® 212 ⁵	101.5	4.1	12.18	4.06
Talcron® 40 LOA Talc ⁶	72.1	3.1	8.65	3.09
325 mesh wet ground mica	7.7	0.3	0.92	0.33
<i>Disperse at high speed for 15 minutes. Reduce speed for let down.</i>				
Epi-Rez® 5522-WY-55 ²	149.0	16.6	17.88	16.56
Water	14.5	1.7	1.74	1.74
<i>Mix at slow speed for 5 minutes.</i>				
TOTALS PARTS A	1002.9	79.6	120.35	79.69
PART B				
Epi-Cure® 8290-Y-60 ²	61.3	6.9	7.35	6.93
Water	111.6	13.4	13.39	13.39
<i>Mix at slow speed for 5 minutes.</i>				
Totals PART B	172.9	20.3	20.74	20.32
<i>Add PART B to PART A, mix well, let stand 1 hour prior to use.</i>				
Totals PART A plus PART B	1175.8	99.9	141.09	100.01
PAINT PROPERTIES (PART A plus PART B)				
Density		11.8 lbs/gal		1.41 g/ml
% Solids by weight		62.9		
% Solids by volume		47.0		
% PVC		33.3		
Pigment to binder ratio		1.42:1		
Calculated VOC		1.11 lbs/gal		133 g/l

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Hexion Specialty Chemicals, Houston, TX

³Rhodia Inc., Cranbury, NJ

⁴Rockwood Pigments NA, Inc., Beltsville, MD

⁵Moly-White Pigments Group, Cleveland, OH

⁶Specialty Minerals, Inc., Barretts, MT

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http://www.vanderbiltminerals.com/ee_content/Documents/Technical/Trademarks_VM_Web.pdf

Epi-Cure and Epi-Rez are registered trademarks of Resolution Performance Products.

Mapico is a registered trademark of Rockwood Pigments NA, Inc.

Moly-White is a registered trademark of SWIMC, Inc.

Rhodoline is a registered trademark of Rhodia.

Talcron is a registered trademark of Minerals Technologies Inc.

Rev02/19/2013

Formula 111808
Interior Floor Coating
DARVAN® 7-N¹ Dispersant, VANSIL® W-50¹ Wollastonite

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Water	105.0	12.6	12.60	12.60
Igepal® CO 630 ²	2.0	0.2	0.24	0.23
Soya Lecithin	2.0	0.2	0.24	0.23
DARVAN 7-N¹ Dispersant	5.0	0.5	0.60	0.52
Drewplus® L 475 ³	1.5	0.5	0.18	0.20
Ti-Pure® R 902 ⁴	115.0	3.5	13.80	3.45
ATTAGEL™ 50 ⁵	10.0	0.5	1.20	0.51
VANSIL W-50¹ Wollastonite	145.0	6.0	17.39	6.00

High speed disperse for 20 minutes. Set aside.

LET DOWN

Water	160.0	19.2	19.19	19.19
Aquamac® 450 Latex ⁶	370.0	42.1	44.39	42.07
Drewplus L 475 ³	1.5	0.2	0.18	0.20

Add dispersion while mixing at medium speed.

Preblend the next five items, mix at slow speed for 1 minute and add:

Ethylene Glycol	5.0	0.5	0.60	0.54
Texanol® ⁷	15.0	1.9	1.80	1.88
Butyl Carbitol® ⁸	4.0	0.5	0.48	0.50
Acrysol® RM 2020 NPR ⁹	10.0	1.1	1.20	1.15
Acrysol® RM 825 ⁹	10.0	1.1	1.20	1.15
Water	75.0	9.0	9.00	9.00
Polyphobe® TR 116 ⁸	2.5	0.3	0.30	0.27
AMP-95® ¹⁰	1.0	0.1	0.12	0.13
Drewplus L 475 ³	1.5	0.2	0.18	0.20

Mix at slow speed for 30 minutes. Post add black tint paste to make the paint gray.

TOTALS	1041.0	100.2	124.89	100.02
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PAINT PROPERTIES

Density	10.4 lbs/gal	1.25 g/ml
% Solids by weight	43.7	
% Solids by volume	29.3	
% PVC	32.5	
Pigment to binder ratio	1.40:1	
Calculated VOC	0.68 lbs/gal	81 g/l

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
- ²Rhodia Inc., Cranbury, NJ
- ³Ashland Chemical Company, Covington, KY
- ⁴E.I. DuPont de Nemours & Company, Wilmington, DE
- ⁵BASF Corporation, Florham Park, NJ
- ⁶Hexion Specialty Chemicals, Houston, TX
- ⁷Eastman Chemical Company, Kingsport, TN
- ⁸Dow Chemical Company, Midland, MI
- ⁹Rohm & Haas Company, Philadelphia, PA
- ¹⁰Angus Chemical Company, Buffalo Grove, IL

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Acrysol is a registered trademark of Rohm & Haas Company.
 AMP-95 is a registered trademark of Angus Chemical Company.
 Aquamac is a registered trademark of Resolution Specialty Materials.
 ATTAGEL™ is a trademark of BASF Catalysts LLC.
 Carbitol and Polyphobe are registered trademarks of Union Carbide Chemicals & Plastics Technology Corporation.
 Drewplus is a registered trademark of Ashland Licensing and Intellectual Property LLC.
 Igepal is a registered trademark of Rhodia.
 Texanol is a registered trademark of Eastman Chemical Company.
 Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

Formula 062001
2K Water-Borne Epoxy Fast Dry Shop Primer
VANSIL® W-50¹ Wollastonite

	Pounds	Gallons	Kilograms	Liters
PART A				
Epi-Rez® 5522-WY-55 ²	334.3	37.1	40.12	37.14
Diacetone Alcohol	7.3	0.9	0.87	0.92
Rhodoline® 640 ³	3.6	0.4	0.44	0.43
Water	60.8	7.3	7.30	7.30
Red Iron Oxide	72.1	1.7	8.65	1.73
Huberbrite™ ⁴	72.1	1.9	8.65	1.92
VANSIL W-50¹ Wollastonite	107.9	4.5	12.95	4.47
Moly-White® 212 ⁵	101.5	4.1	12.18	4.06
Zeeospheres® G 400 ⁶	72.1	3.1	8.65	3.09
325 mesh wet ground mica ⁷	7.7	0.3	0.92	0.33
<i>Disperse at high speed for 15 minutes. Reduce speed for let down.</i>				
Epi-Rez 5522-WY-55 ²	149.0	16.6	17.88	16.56
Water	14.5	1.7	1.74	1.74
<i>Mix at slow speed for 5 minutes.</i>				
TOTALS PART A	1002.9	79.6	120.35	79.69
PART B				
Epi-Cure® 8290-Y-60 ²	61.3	6.9	7.35	6.93
Water	111.6	13.4	13.39	13.39
<i>Mix at slow speed for 5 minutes.</i>				
Totals PART B	172.9	20.3	20.74	20.32
<i>Add PART B to PART A, mix well, let stand 1 hour prior to use.</i>				
Totals PART A plus PART B	1175.8	99.9	141.09	100.01
PAINT PROPERTIES (PART A plus PART B)				
Density	11.8 lbs/gal		1.41 g/ml	
% Solids by weight	62.9			
% Solids by volume	47.0			
% PVC	33.3			
Pigment to binder ratio	1.42:1			
Calculated VOC	1.11 lbs/gal		133 g/l	

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Hexion Specialty Chemicals, Houston, TX

³Rhodia Inc., Cranbury, NJ

⁴J.M. Huber Corporation, Edison, NJ

⁵Moly-White Pigment Group, Cleveland, OH

⁶3M Company, Minneapolis, MN

⁷KMG Minerals Inc., Kings Mountain, NC

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Huberbrite is a trademark of J.M. Huber Corporation.

Moly-White is a registered trademark of SWIMC, Inc.

Rhodoline is a registered trademark of Rhodia.

Zeeospheres is a registered trademark of 3M Company.

Rev02/19/2013

Formula 020503
Black Gloss Enamel Water-Reducible Alkyd Coating
ACTIV-8^{®1} Drier, Stabilizer and Accelerator

	Pounds	Gallons	Kilograms	Liters
GRIND				
Kelso [®] 3961-B2G-75 ²	145.0	16.6	17.39	16.56
<i>Preblend the next four items and add:</i>				
Arcosolv [®] PnB ³	20.0	2.8	2.40	2.75
Calcium sulfonate corrosion inhibitor	20.0	2.5	2.40	2.50
ACTIV-8¹ Drier, Stabilizer and Accelerator	2.0	0.3	0.24	0.25
Cobalt Hydrocure [®] II ⁴	4.8	0.6	0.58	0.63
AMP-95 ⁵	10.0	1.3	1.20	1.27
<i>Measure pH and adjust to 8.0 to 8.5 with AMP-95.</i>				
<i>Mix at slow speed for 5 minutes.</i>				
Raven [®] 1255 ⁶	17.5	1.2	2.10	1.20
Water	250.7	30.0	29.98	29.98
<i>Steel ball mill to 7 Hegman fineness. Transfer to let down tank.</i>				
LET DOWN				
Kelso 3961-B2G-75 ²	115.0	13.1	13.79	13.13
AMP-95 ⁵	5.0	0.6	0.60	0.64
<i>Adjust pH to 8.0 to 8.5</i>				
<i>Premix the next two items and add:</i>				
Arcosolv PnB ³	10.0	1.4	1.20	1.38
Water	245.2	29.4	29.68	29.68
<i>Mix at slow speed for 10 minutes.</i>				
TOTALS	845.2	99.8	101.56	99.97
PAINT PROPERTIES				
Density		8.5 lbs/gal		1.06 g/ml
% Solids by weight		25.1		
% Solids by volume		21.1		
% PVC		5.7		
Pigment to binder ratio		0.90:1		
Calculated VOC		2.71 lbs/gal		325 g/l

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold, Inc., Research Triangle Park, NC

³Lyondell Chemical Company, Rotterdam, The Netherlands

⁴OM Group, Inc., Cleveland, OH

⁵Angus Chemical Company, Buffalo Grove, IL

⁶Columbian Chemicals Company, Marietta, GA

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AMP-95 is a registered trademark of Angus Chemical Company.

Arcosolv is a registered trademark of Lyondell Chemical Company.

Cobalt Hydrocure is a registered trademark of OM Group, Inc.

Kelso is a registered trademark of Reichhold Chemical, Inc.

Raven is a registered trademark of Columbian Chemical Company.

Rev09/10/2013

Formula 020398
Water Reducible Alkyd Modified Acrylic Latex Direct to Metal Primer
ACTIV-8^{®1} Drier, Stabilizer and Accelerator

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Kelso [®] 3961-B2G-75 ²	68.1	7.8	8.17	7.78
Barium sulfonate corrosion inhibitor	25.0	3.2	3.00	3.00
<i>Preblend the next four items and add:</i>				
Arcosolv [®] PnB ³	26.2	3.6	3.14	3.61
Arcosolv [®] PM Acetate ³	5.2	0.7	0.62	0.65
ACTIV-8¹ Drier, Stabilizer and Accelerator	0.4	0.1	0.05	0.05
Cobalt Hydrocure [®] II ⁴	1.5	0.2	0.18	0.20
Triethanolamine	4.2	0.5	0.50	0.50
Water	125.3	13.8	15.04	15.04
<i>Measure pH and adjust to 8.0 to 8.5 with triethanolamine.</i>				
Ti-Pure [®] R 900 ⁵	50.0	1.5	6.00	1.50
<i>High speed disperse for 15 minutes. Reduce speed for let down.</i>				
LET DOWN				
NeoCryl [®] 6085 Latex ⁶	523.8	60.2	62.86	60.44
Arcosolv PnB	31.4	4.3	3.77	4.32
Water	34.2	4.1	2.92	2.92
<i>Mix at slow speed for 10 minutes.</i>				
TOTALS	895.3	100.0	106.25	100.01
PAINT PROPERTIES				
Density		9.0 lbs/gal		1.06 g/ml
% Solids by weight		36.5		
% Solids by volume		30.7		
% PVC		5		
Pigment to binder ratio		0.19:1		
Calculated VOC		1.98 lbs/gal		238 g/l

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¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold, Inc., Research Triangle Park, NC

³Lyondell Chemical Company, Rotterdam, The Netherlands

⁴OM Group, Inc., Cleveland, OH

⁵E.I. DuPont de Nemours & Company, Wilmington, DE

⁶AstraZeneca Pharmaceuticals LP, Wilmington, DE

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Cobalt Hydrocure is a registered trademark of OM Group, Inc.

Kelsol is a registered trademark of Reichhold Chemical, Inc.

NeoCryl is a registered trademark of DSM NeoResins B.V.

Ti-Pure is a registered trademark of E.I. DuPont de Nemours Company

Rev09/10/2013

Formula 090909
High Solids Alkyd Corrosion Inhibitive Primer
VANSIL® W-30¹ Wollastonite,
ACTIV-8®¹ Drier Stabilizer and Accelerator

	Pounds	Gallons	Kilograms	Liters
GRIND				
Beckosol® 3859-Z-80 High Solids Alkyd Resin ²	185.0	20.7	22.19	20.74
Aromatic® 100 ³	125.0	17.2	15.00	17.18
Soya Lecithin	5.0	0.6	0.60	0.58
Anti-Terra® U ⁴	5.0	0.3	0.60	0.31
Moly-White™ MZAP ⁵	125.0	5.0	15.00	5.00
Ti-Pure® R 900 ⁶	125.0	3.8	15.00	3.75
Talcron® 35 LOA talc ⁷	159.0	6.8	19.07	6.81
VANSIL W-30¹ Wollastonite	53.0	2.2	6.36	2.19
Baricron™ 1085 ⁷	330.0	8.8	39.59	8.80

Mix at high speed for 15 minutes. Hegman fineness target 4-5. Reduce speed for let down.

LET DOWN

Beckosol® 3859-Z-80 High Solids Alkyd Resin ²	185.0	20.7	22.19	20.74
Aromatic® 100 ³	91.6	12.6	11.00	12.60
<i>Preblend the next 7 items and add:</i>				
Butyl Alcohol	25.0	3.7	3.00	3.70
Xylene	25.0	3.5	3.00	3.49
ACTIV-8¹ Drier Stabilizer and Accelerator	1.2	0.2	0.14	0.15
12% Cobalt Cem-All® ⁸	1.0	0.1	0.12	0.12
12% Zirconium Hex-cem® ⁸	2.1	0.3	0.25	0.26
12% Calcium Cem-All® ⁸	4.1	0.5	0.50	0.55
Skino® No. 2 ⁸	2.5	0.3	0.30	0.33

Mix at slow speed for 10 minutes.

TOTALS	1384.5	100.1	166.12	100.00
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PAINT PROPERTIES

Density	13.8 lbs/gal	1.66 g/l
% Solids by weight	75.8	
% Solids by volume	53.0	
% PVC	49.9	
Pigment to binder ratio	3.08:1	
Calculated VOC	3.31lbs/gal	398 g/l

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
- ²Reichhold Inc. Research-Triangle Park, NC
- ³Exxon-Mobile Chemical, Houston, TX
- ⁴BYK USA, Wallingford, CT
- ⁵Moly-White Pigments Group, Cleveland, OH
- ⁶E.I. DuPont de Nemours, Wilmington, DE
- ⁷Specialty Minerals Inc., Barretts, MT
- ⁸OM Group, Cleveland, OH

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Anti-Terra is a registered trademark of Byk-Chemie GmbH.
 Aromatic is a registered trademark of ExxonMobil Corporation.
 Baricron is a registered trademark of Specialty Minerals (Michigan) Inc.
 Beckosol is a registered trademark of Reichhold Chemicals, Inc.
 Cem-All, Hex-Cem and Skino are registered trademarks of OM Group, Inc.
 Moly-White is a registered trademark of SWIMC, Inc.
 Talcron is a registered trademark of Minerals Technologies Inc.
 Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

rev02/19/2013

Formula 011300
Water-Reducible Alkyd/Acrylic Latex Direct to Metal Primer
ACTIV-8^{®1} Drier Accelerator & Stabilizer

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Kelso [®] 3961-B2G-75 ²	68.1	7.8	8.2	7.78
Barium sulfonate corrosion inhibitor	25.0	3.0	3.0	3.00
<i>Preblend next four items and add:</i>				
Arcosolv [®] PnB ³	26.2	3.6	3.1	3.60
Arcosolv PM Acetate ³	5.2	0.6	0.6	0.65
Cobalt Hydrocure [®] II ⁴	1.5	0.2	0.2	0.20
ACTIV-8¹ Drier Accelerator & Stabilizer	0.4	0.1	0.1	0.05
Ti-Pure [®] R 900 ⁵	50.0	1.5	6.0	1.50
<i>Disperse at high speed to 7 Hegman fineness. Reduce speed for neutralization.</i>				
AMP-95 ^{®6}	2.5	0.3	0.3	0.32
Water	125.3	15.0	15.0	15.00
<i>Measure pH and adjust to 8.0 to 8.5 with AMP-95. Mix at slow speed for 10 minutes.</i>				
LET DOWN				
NeoCryl [®] 6085 Latex ⁷	523.4	60.4	62.8	60.36
Arcosolv PnB ³	31.4	4.3	3.8	4.32
Water	26.7	3.2	3.2	3.20
<i>Measure pH and adjust to 8.0 to 8.5 with AMP 95⁶</i>				
<i>Mix at slow speed for 10 minutes</i>				
TOTALS	885.7	100.0	106.2	99.98
PAINT PROPERTIES				
Density	8.9 lbs/gal		1.062 g/ml	
% Solids by weight	35.1			
% Solids by volume	29.5			
% PVC	5			
Pigment to binder ratio	0.19:1			
Calculated VOC	1.84 lbs/gal		221 g/l	

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
²Reichhold, Inc., Research Triangle Park, NC
³Lyondell Chemical Company, Rotterdam, The Netherlands
⁴OM Group, Inc., Cleveland, OH
⁵E.I. DuPont de Nemours & Company, Wilmington, DE
⁶Angus Chemical Company, Buffalo Grove, IL
⁷DSM NeoResins, Wilmington, MA

TRADEMARKS

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 AMP-95 is a registered trademark of Angus Chemical Company.
 Arcosolv is a registered trademark of Lyondell Chemical Company.
 Cobalt Hydrocure is a registered trademark of OM Group, Inc.
 Kelsol is a registered trademark of Reichhold Chemical, Inc.
 NeoCryl is a registered trademark of DSM NeoResins B.V.
 Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

Rev09/10/2013

Formula 100499
Water-Reducible Alkyd Corrosion Inhibitive Primer
ACTIV-8^{®1} HGL Drier Stabilizer and Accelerator

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Kelsol [®] 3961-B2G-75 ²	300.0	34.3	36.2	34.50
Raven [®] 1225 ³	10.0	1.3	1.2	0.69
Molywhite [®] 212 ⁴	50.0	2.0	6.0	2.01
<i>Steel Ball mill to 7 Hegman fineness.</i>				
<i>Preblend the next three items, let stand 1 hour then add:</i>				
2-Butoxy Ethanol	30.0	4.0	3.6	4.02
ACTIV-8 HGL¹	0.9	0.1	0.1	0.11
12% Cobalt drier	0.5	0.1	0.1	0.06
NEUTRALIZATION				
Nopco [®] NDW ⁵	2.0	0.3	0.2	0.27
AMP 95 ^{®6}	5.0	0.6	0.6	0.64
Water	477.9	57.3	57.7	57.71
<i>Measure pH and adjust to 8.0 to 8.5 with AMP 95.</i>				
<i>Mix at slow speed for 10 minutes.</i>				
TOTALS	876.3	100.0	105.7	100.01
PAINT PROPERTIES				
Density		8.8 lbs/gal		1.06 g/ml
% Solids by weight		32.5		
% Solids by volume		26.3		
% PVC		12.5		
Pigment to binder ratio		0.27:1		
Calculated VOC		1.94 lbs/gal		233 g/l

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold, Inc., Research Triangle Park, NC

³Columbian Chemicals Company, Marietta, GA

⁴Sherwin-Williams Company, Cleveland, OH

⁵Henkel Corporation, Ambler, PA

⁶Angus Chemical Company, Buffalo Grove, IL

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AMP-95 is a registered trademark of Angus Chemical Company.

Kelsol is a registered trademark of Reichhold Chemical, Inc.

Moly-White is a registered trademark of SWIMC, Inc.

Nopco is a registered trademark of Henkel Corporation.

Raven is a registered trademark of Columbian Chemical Company.

rev2/19/2013

Formula 050211
High Solids Alkyd Corrosion Inhibitive Coating
VANSIL® W 50¹ Wollastonite, **ACTIV-8®¹** Drier, Stabilizer and Accelerator

	<u>Pounds</u>	<u>Gallons</u>	<u>Kilograms</u>	<u>Liters</u>
GRIND				
Beckosol® 6421-X-75 HS Alkyd Resin ²	150.0	16.7	18.00	16.68
Triethanol Amine	2.0	0.3	0.24	0.24
Nuosperse® 657 ³	8.0	1.0	0.96	1.02
Xylene	68.1	9.5	8.17	9.50
Ti-Pure® R900 ⁴	250.0	7.5	30.00	7.50
VANSIL® W 50¹	25.0	1.0	3.00	1.03
Moly-White® 212 ⁵	25.0	1.0	3.00	1.00

Mix at high speed for 15 minutes. Reduce speed for let down.
LET DOWN

Beckosol® 6421-X-75 HS Alkyd Resin ²	405.0	45.0	48.61	45.00
Xylene	61.7	8.6	7.40	8.60
<i>Preblend the next 6 items and add:</i>				
50/50 Butanol/xylene	50.0	7.2	6.00	7.19
ACTIV-8®¹	2.1	0.3	0.25	0.27
6% Cobalt Cem-All® ⁶	3.5	0.5	0.42	0.48
6% Calcium Cem-All® ⁶	7.0	0.9	0.84	0.93
12% Zirconium Hex-Cem® ⁶	3.5	0.4	0.42	0.43
Exkin® No 2 ³	1.0	0.1	0.12	0.13

Mix at slow speed for 10 minutes.

TOTALS	1061.91	100.0	127.43	100.00
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PAINT PROPERTIES

Density	10.6 lbs/gal	1.27 g/l
% Solids by weight	67.4	
% Solids by volume	52.1	
% PVC	18.2	
Pigment to binder ratio	0.72:1	
Calculated VOC	3.31 lbs/gal	397 g/l

RAW MATERIAL SUPPLIERS
¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold Incorporated, Research Triangle Park, NC

³CONDEA Servo LLC, South Plainfield, NJ

⁴E.I. DuPont de Nemours & Company, Wilmington, DE

⁵Moly-White Pigments Group, Cleveland, OH

⁶OM Group, Incorporated, Cleveland, OH

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Cem-All and Hex-Cem are registered trademarks of OM Group, Inc.

Exkin and Nuosperse are registered trademarks of CONDEA Servo, LLC.

Moly-White is a registered trademark of SWIMC, Inc.

Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

Rev02/19/2013

Formula 062811
Water-Borne Alkyd Modified Acrylic Latex Corrosion Inhibitive Primer
VANSIL® W 50¹ Wollastonite, DARVAN® CN¹ Dispersing Agent,
ACTIV-8®¹, Drier Accelerator and Stabilizer

	<u>Pounds</u>	<u>Gallons</u>	<u>Kilograms</u>	<u>Liters</u>
DISPERSION				
Water	116.8	14.0	13.99	13.99
Cellosize® QP 4400 ²	1.0	0.1	0.12	0.09
AMP-95® ³	0.5	0.1	0.06	0.06
Butyl Carbitol ²	50.0	6.3	5.99	6.28
DARVAN® CN¹	18.0	1.9	2.16	1.94
Igepal® CO 630 ⁴	2.5	0.3	0.30	0.28
Surfynol® 104 BC ⁵	4.0	0.5	0.48	0.53
Ti-Pure® R 900 ⁶	100.0	3.0	11.98	2.99
VANSIL® W 50¹	60.6	2.5	7.26	2.50
Halox® SZP 391 ⁷	67.6	2.5	8.10	2.50
Kadox® 515 ⁸	5.0	0.1	0.60	0.11

Mix at high speed for 15 minutes. Reduce speed for let down.

LET DOWN

Rhoplex® MV 23 LO ²	500.0	57.9	59.88	57.80
Texanol® ⁹	5.5	0.7	0.66	0.69

Preblend the next 5 items and add:

Beckosol® 1271 ¹⁰	55.6	6.7	6.66	6.66
ACTIV-8®¹	0.2	0.0	0.02	0.03
6% Cobalt drier	0.3	0.0	0.04	0.04
12% Zirconium drier	1.7	0.2	0.20	0.21
6% Manganese drier	0.3	0.0	0.04	0.03
Drewplus® L 475 ¹¹	1.0	0.1	0.12	0.13
Nuosept® 95 ¹¹	2.0	0.2	0.24	0.21
Acrysol® RM 825 ²	15.0	1.7	1.80	1.73
10% Sodium Nitrite	10.0	1.2	1.20	1.20

Mix at slow speed for 10 minutes.

TOTALS	1017.3	100.0	121.86	100.00
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PAINT PROPERTIES

Density	10.2lbs/gal	1.219 g/l
% Solids by weight	51.6	
% Solids by volume	40.4	
% PVC	20	
Pigment to binder ratio	0.90:1	
Calculated VOC	1.37 lbs/gal	164 g/l

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
- ²Dow Chemical Company, Midland, MI
- ³Angus Chemical Company, Buffalo Grove, IL
- ⁴Rhodia Incorporated, Cranberry, NJ
- ⁵Air Products and Chemicals, Allentown, PA
- ⁶E.I. DuPont de Nemours & Company, Wilmington, DE
- ⁷Halox Pigment, Hammond, IN
- ⁸Zinc Corporation of America, Monaca, PA
- ⁹Eastman Chemical, Kingsport, TN
- ¹⁰Reichhold Incorporated, Research Triangle Park, NC
- ¹¹Ashland Specialty Chemical Company, Columbus, OH

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 Surfynol is a registered trademark of Air Products and Chemicals, Inc.
 Texanol is a registered trademark of Eastman Chemical Company.
 Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

Rev02/19/2013

Formula 081512
Waterborne Alkyd Emulsion Direct-to-Metal Primer
DARVAN® C-N¹ Dispersing Agent, VANSIL® W-30¹ Wollastonite,
ACTIV-8®¹ Drier Accelerator

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Water	150.0	18.0	18.03	18.03
AMP-95® ²	2.0	0.3	0.24	0.26
DARVAN® C-N¹	10.0	1.1	1.20	1.08
Surfynol® 104 BC ³	2.0	0.3	0.24	0.27
Drewplus® L 475 ⁴	2.0	0.3	0.24	0.26
Red Iron Oxide	50.0	1.3	6.01	1.25
Moly-White® MZAP ⁵	50.0	2.0	6.01	2.00
VANSIL® W-30¹	50.0	2.1	6.01	2.07
Gama-Sperse® 80 ⁶	100.0	4.4	12.02	4.43

Disperse at high speed for 15 minutes. Set aside.

LET DOWN

Preblend the drier accelerator and driers then add to the resin.

50/50 n-Butanol/Xylene	20.0	2.9	2.40	2.86
ACTIV-8®¹	0.6	0.1	0.07	0.08
12% Cobalt Cem-All® ⁷	2.5	0.3	0.30	0.33
12% Zirconium Hex-Cem® ⁷	4.2	0.5	0.51	0.52
Beckosol AQ® 210 ⁸	454.5	51.1	54.62	51.19

Mix at slow speed for 5 minutes.

Add DISPERSION and mix at slow speed for 5 minutes.

Drewplus® L 475 ⁴	2.0	0.3	0.24	0.26
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Preblend the next two items and add.

Water	50.0	6.0	6.01	6.01
Acrysol® RM 825 ⁹	5.0	0.6	0.60	0.58
Water	70.8	8.5	8.51	8.51

Mix at slow speed for 10 minutes.

TOTALS	1025.6	100.1	123.26	99.99
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PAINT PROPERTIES

Density	10.2 lbs/gal	1.23 g/ml
% Solids by weight	50.2	
% Solids by volume	37.9	
PVC	26.5	
Pigment to binder ratio	1.00:1	
Calculated VOC	0.58 lbs/gal	70 g/L

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
²Angus Chemical Company, Buffalo Grove, IL
³Air Products and Chemicals, Allentown, PA
⁴Ashland Specialty Chemical Company, Columbus, OH
⁵Moly-White Pigments Group, Cleveland, OH
⁶Imerys Minerals, Ltd., Roswell, GA
⁷OM Group, Incorporated, Cleveland, OH
⁸Reichhold Incorporated, Research Triangle Park, NC
⁹Dow Chemical Company, Midland, MI

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 AMP-95 is a registered trademark of Angus Chemical Company.
 Beckosol AQ is a registered trademark of Reichhold, Inc.
 Cem-All and Hex-Cem are registered trademarks of OM Group, Inc.
 Drewplus is a registered trademark of Ashland Licensing and Intellectual Property, LLC.
 Gama-Sperse is a registered trademark of Imerys Marble, Inc.
 Moly-White is a registered trademark of SWIMC, Inc.
 Surfynol is a registered trademark of Air Products and Chemicals, Inc.

Rev02/19/2013

Formula 050614

Water-borne Alkyd Emulsion Red Iron Oxide Primer

VEEGUM® R Magnesium Aluminum Silicate¹, **DARVAN® C-N** Dispersing Agent¹,
VANSIL® CK-20 Wollastonite¹, **ACTIV-8®** Drier Accelerator and Stabilizer¹

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Water	139.5	16.7	16.73	16.73
AMP-95 ⁰²	2.0	0.3	0.24	0.26
DARVAN® C-N Dispersing Agent ¹	9.3	1.0	1.11	1.01
Surfynol® 104 BC ³	2.0	0.3	0.24	0.27
Drewplus® L 475 ⁴	2.0	0.3	0.24	0.26
Red Iron Oxide	50.0	1.3	6.00	1.25
Moly-White® 212 ⁵	50.0	2.0	6.00	2.00
VANSIL® CK-20 Wollastonite ¹	50.0	2.0	6.00	2.07
Gama-Sperse® 80 ⁶	100.0	4.4	11.99	4.43
VEEGUM® R Magnesium Aluminum Silicate ¹	9.5	0.4	1.13	0.44

Disperse at high speed for 15 minutes. Set aside.
LET DOWN
Preblend the driers in the butanol/xylene then add to the resin.

50/50 Butanol/xylene	19.0	2.7	2.28	2.71
ACTIV-8® Drier Accelerator and Stabilizer ¹	0.6	0.1	0.07	0.08
12% Co Cem-All ⁰⁷	0.9	0.1	0.11	0.12
12% Zr Hex-Cem ⁰⁷	3.9	0.5	0.47	0.48
Skino® No. 2 ⁷	1.0	0.1	0.12	0.13
Beckosol AQ® 210 ⁸	420.0	47.2	50.37	47.21

Mix at slow speed for 5 minutes.
Add DISPERSION.

Drewplus® L 475 ⁴	2.0	0.3	0.24	0.26
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Preblend the next two items and add.

Water	45.0	5.4	6.01	5.40
Acrysol® RM 825 ⁹	5.0	0.6	0.90	0.58
Water	119.5	14.3	7.82	14.33

Mix at slow speed for 10 minutes

TOTALS	1031.2	100.0	123.67	100.00
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PAINT PROPERTIES

Density	10.3 lbs/gal	12.37 g/ml
% Solids by weight	46.7	
% Solids by volume	34.5	
PVC	28	
Pigment to binder ratio	1.09:1	
Calculated VOC	0.52 lbs/gal	62 g/L

RAW MATERIAL SUPPLIERS

- ¹Vanderbilt Minerals, LLC, Norwalk, CT
- ²Angus Chemical Company, Buffalo Grove, IL
- ³Air Products and Chemicals, Allentown, PA
- ⁴Ashland Specialty Chemical Company, Columbus, OH
- ⁵Moly-White Pigments Group, Cleveland, OH
- ⁶Imerys Minerals, Ltd, Roswell, GA
- ⁷OM Group, Incorporated, Cleveland, OH
- ⁸Reichhold Incorporated, Research Triangle Park, NC
- ⁹Dow Chemical Company, Midland, MI

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 Cem-All, Hex-Cem and Skino are registered trademarks of OM Group, Inc.
 Drewplus is a registered trademark of Ashland Licensing and Intellectual Property, LLC.
 Gama-Sperse is a registered trademark of Imerys Marble, Inc.
 Moly-White is a registered trademark of SWIMC, Inc.
 Surfynol is a registered trademark of Air Products and Chemicals, Inc.

Formula 080815
White Water-Reducible Alkyd Corrosion Inhibitive Coating
VANSIL® W-50¹ Wollastonite, ACTIV-8®¹ Drier Accelerator and Stabilizer

	<u>Pounds</u>	<u>Gallons</u>	<u>Kilograms</u>	<u>Liters</u>
DISPERSION				
Kelsol® 3969-B2G-70 ²	165.0	18.5	19.79	18.50
28% Ammonium Hydroxide	7.6	1.0	0.91	0.98
Butyl Cellosolve® ³	25.0	3.4	3.00	3.33
Ti-Pure® R706 ⁴	100.0	3.0	12.00	3.00
Halox® SZP-111 ⁵	54.0	2.0	6.48	2.00
VANSIL® W-50¹	48.8	2.0	5.85	2.02
Water	166.8	20.0	20.01	20.01
Drewplus® L 475 ⁶	2.0	0.3	0.24	0.26

Measure pH and adjust to 8-8.5 with Ammonium Hydroxide.

Mix at high speed for 20 minutes. Reduce speed for let down.

LET DOWN

Kelsol® 3969-B2G-70 ²	127.3	14.3	15.27	14.27
28% Ammonium Hydroxide	4.5	0.5	0.54	0.58
<i>Preblend driers and add:</i>				
Butyl Cellosolve® ³	10.6	1.4	1.27	1.41
ACTIV-8®¹	1.0	0.1	0.12	0.13
Cobalt Hydrocure® II ⁷	6.1	0.8	0.73	0.80
Skino® No. 2 ⁷	1.0	0.1	0.12	0.13
Water	269.4	32.3	32.32	32.32
Drewplus® L 475 ⁶	2.0	0.3	0.24	0.26

Measure pH and adjust to 8-8.5 with Ammonium Hydroxide.

Mix at slow speed for 10 minutes.

TOTALS	991.1	100.0	118.90	100.01
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PAINT PROPERTIES

Density	9.9 lbs/gal	1.19 g/L
% Solids by weight	41.1	
% Solids by volume	27.7	
PVC	25.3	
Pigment to binder ratio	0.99:1	
Calculated VOC	2.67 lbs/gal	320 g/L

RAW MATERIAL SUPPLIERS

¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold Incorporated, Research Triangle Park, NC

³Dow Chemical, Midland, MI

⁴E.I. DuPont de Nemours & Company, Wilmington, DE

⁵Halox Pigment, Hammond, IN

⁶Ashland Specialty Chemical Company, Columbus, OH

⁷OM Group, Incorporated, Cleveland, OH

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Drewplus is a registered trademark of Ashland Licensing and Intellectual Property, LLC.

Halox is a registered trademark of Halox Pigments.

Hydro-Cure and Skino are registered trademarks of OM Group, Inc.

Kelsol is a registered trademark of Reichhold Chemical, Inc.

Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.

November 1, 2015

Formula 080715
White Water-Reducible Alkyd Corrosion Inhibitive Coating
VANSIL® W-50¹ Wollastonite, ACTIV-8®¹ Drier Accelerator and Stabilizer

	Pounds	Gallons	Kilograms	Liters
DISPERSION				
Kelsol® 3969-B2G-70 ²	165.0	18.5	19.79	18.50
28% Ammonium Hydroxide	7.6	1.0	0.91	0.98
Butyl Cellosolve® ³	25.0	3.4	3.00	3.33
Ti-Pure® R706 ⁴	100.0	3.0	12.00	3.00
Halox® SW-111 ⁵	48.0	2.0	5.76	2.01
VANSIL® W-50¹	48.8	2.0	5.85	2.02
Water	166.8	20.0	20.01	20.01
Drewplus® L 475 ⁶	2.0	0.3	0.24	0.26

Measure pH and adjust to 8-8.5 with Ammonium Hydroxide.

Mix at high speed for 20 minutes. Reduce speed for let down.

LET DOWN

Kelsol® 3969-B2G-70 ²	127.3	14.3	15.27	14.27
28% Ammonium Hydroxide	4.5	0.5	0.54	0.58
<i>Preblend driers and add:</i>				
Butyl Cellosolve® ³	10.6	1.4	1.27	1.41
ACTIV-8®¹	1.0	0.1	0.12	0.13
Cobalt Hydrocure® II ⁷	6.1	0.8	0.73	0.80
Skino® No. 2 ⁷	1.0	0.1	0.12	0.13
Water	269.4	32.3	32.32	32.32
Drewplus® L 475 ⁶	2.0	0.3	0.24	0.26

Measure pH and adjust to 8-8.5 with Ammonium Hydroxide.

Mix at slow speed for 10 minutes.

TOTALS	985.1	100.0	118.17	100.01
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PAINT PROPERTIES

Density	9.9 lbs/gal	1.18 g/L
% Solids by weight	40.7	
% Solids by volume	27.7	
PVC	25.3	
Pigment to binder ratio	0.96:1	
Calculated VOC	2.67 lbs/gal	320 g/L

RAW MATERIAL SUPPLIERS

¹Vanderbilt Minerals, LLC, Norwalk, CT

²Reichhold Incorporated, Research Triangle Park, NC

³Dow Chemical, Midland, MI

⁴E.I. DuPont de Nemours & Company, Wilmington, DE

⁵Halox Pigment, Hammond, IN

⁶Ashland Specialty Chemical Company, Columbus, OH

⁷OM Group, Incorporated, Cleveland, OH

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Ti-Pure is a registered trademark of E.I. DuPont de Nemours & Company.