

SETAL® 48-6093

DESCRIPTION

SETAL® 48-6093 is a water-reducible, oxidative drying epoxy ester resin developed as a sole binder for corrosion-resistant protective coatings. It can also be used in combination with suitable crosslinkers for baking applications, and is compatible with select acrylic emulsions for improved dry speed.

TYPICAL PHYSICAL PROPERTIES

Weight Solids	70.0% ± 1.0
Volume Solids	66.1% ± 1.0
Solvent (EGMBE)	Butoxyethanol
Viscosity as Supplied	Z5 – Z7
Reduced Viscosity	Z1 – Z3 (50% in EB)
Acid Value	45 to 55
Color (Gardner)	10 max.
Density (lbs/gal)	8.50 ± .10
Appearance	Clear to Slightly Hazy
Flash Point	151°F

PERFORMANCE BENEFITS

- Excellent Corrosion and Humidity Resistance
- Excellent dry and wet adhesion to a wide variety of Ferrous and non-Ferrous Substrates
- Excellent long term flexibility and impact resistance

SUGGESTED FORMULATIONS

SPF #1776 (1K Grey Metal Primer)

SPF #1777 (Gloss White Enamel – blend with UCECRYL® B 3034)

SPF #1778 (Light Grey Baking Enamel – using CYMEL® 385)

SETAL® 48-6093

Starting Point Formulation #1776



GREY CORROSION RESISTANT METAL PRIMER

<u>Pounds</u>	<u>Gallons</u>	<u>Raw Material</u>	<u>Supplier</u>	<u>Instructions</u>
300.0	35.80	SETAL® 48-6093	allnex	Add ingredients separately and in order with good agitation
6.0	0.73	ADDITOL® XW 395 (leveling)	allnex	
33.0	4.39	Butyl Cellosolve (EB)		
80.0	2.40	Ti-Pure R-706	Chemours	Add powders slowly with increasing agitation
80.0	3.56	Atomite	Imerys	
40.0	1.72	Heucophos ZPA	Huebach	
40.0	1.72	Mistron Ultramix	Imerys	
15.0	0.36	Bayferrox 130M	Lanxess	
5.0	0.25	Attagel 50	BASF	
6.3	0.69	ADDITOL® VXW 6206 (drier)	allnex	Add slowly under good agitation
2.0	0.26	ADDITOL® XL 297 (anti-skin)	allnex	
10.0	1.48	Sec-butanol		
21.0	3.47	Triethylamine		Add amine before increasing speed and adding water slowly
<u>359.7</u>	<u>43.18</u>	Water		
998.00	100.00	Total		

Formulation Parameters

Weight Solids, %	47.93
Volume Solids, %	34.67
Weight / Gallon, lbs/gal	9.98
Pigment Volume Conc., %	28.85
Pigment / Binder	1.19
VOC, g/l	335.64
VOC, lbs/gal	2.80

Typical Paint Properties

pH	8.0-9.0
Viscosity (Stormer, 25C, KU)	90-100

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Starting Point Formulation #1778



LIGHT GREY THERMOSET DIPPING ENAMEL

<u>Pounds</u>	<u>Gallons</u>	<u>Raw Material</u>	<u>Supplier</u>	<u>Instructions</u>
40.0	4.80	Water		Add ingredients separately and in order with good agitation
9.0	1.03	ADDITOL® XW 6588 (dispersant)	allnex	
3.0	0.40	ADDITOL® VXW 4973 (defoamer)	allnex	
150.0	4.50	Kronos 2310	Kronos	Add slowly with good agitation
3.0	0.33	Acrysol RM-2020	Dow	Increase speed and disperse to 7+ Hegman
264.3	31.10	SETAL® 48-6093	allnex	Continue with letdown under good agitation
40.8	3.92	CYMEL® 385	allnex	
12.0	1.64	Dimethylethanolamine		
25.0	3.70	Sec-butanol		
4.0	0.48	ADDITOL® XW 6580 (leveling)	allnex	
2.0	0.28	ADDITOL® XL 123N (slip aid)	allnex	Add slowly with increasing speed
374.5	44.96	Water		
7.0	0.70	Novocolor II 8891N Carbon Black	CCA	Add thickeners slowly to adjust viscosity and rheology
7.0	0.76	Acrysol RM-2020	Dow	
<u>12.0</u>	<u>1.39</u>	ADDITOL® XW 6574 (thickener)	allnex	
953.6	100.00	Total		

Formulation Parameters

Weight Solids, %	40.81
Volume Solids, %	29.99
Weight / Gallon, lbs/gal	9.54
Pigment Volume Conc., %	15.01
Pigment / Binder	0.63
VOC, g/l	306.90
VOC, lbs/gal	2.56

Typical Paint Properties

Bake Schedule	10' @ 300°F
pH	8.0-8.5
Viscosity (#2 Zahn Cup, seconds)	22-26
20°/60° Gloss (.5-.7 mils DFT)	54 / 83
Hardness (König, oscillations)	79
MEK Double Rubs	50 - PASS

GLOSS WHITE AIR DRY ENAMEL USING SETAL® 48-6093 AND UCECRYL® B 3034

<u>Pounds</u>	<u>Gallons</u>	<u>Raw Material</u>	<u>Supplier</u>	<u>Instructions</u>
110.0	12.94	SETAL® 48-6093	allnex	Add ingredients separately and in order with good agitation
12.0	1.37	ADDITOL® XW 6588 (dispersant)	allnex	
3.0	0.36	Airex 901w	Evonik	
4.0	0.48	ADDITOL® XW 6580 (leveling)	allnex	
20.0	2.66	Butyl Cellosolve (EB)		
200.0	6.01	Ti-Pure R-706	Chemours	Increase speed and disperse to 7+ Hegman
5.0	0.67	Ammonia (29%)		When grind is achieved, continue let down under high speed
221.2	26.55	Water		
10.0	1.14	30% Halox 570 Solution	ICL	
400.0	46.19	UCECRYL® B 3034	allnex	
10.0	1.09	Acrysol RM-2020	Dow	Add under good agitation to adjust viscosity and rheology
5.0	0.55	Acrysol RM-8W	Dow	
1000.2	100.00	Total		

Formulation Parameters

Weight Solids, %	47.59
Volume Solids, %	36.31
Weight / Gallon, lbs/gal	10.00
Pigment Volume Conc., %	16.68
Pigment / Binder	0.73
VOC, g/l	146.42
VOC, lbs/gal	1.22

Typical Paint Properties

pH	8.0-8.5
Viscosity (Stormer, 25C, KU)	75-85
Gloss (20°/60°, .003 Bird bar on Leneta)	40.5°/76.6°
Set to Touch	<20 min
Tack Free	<40 min

SETAL[®] 48-6093

Formulation Guidelines



Optimal raw material selection is important to all final performance characteristics. The Starting Point Formulas contained in this document have been found stable and of adequate performance in laboratory testing. Below is a list of raw materials evaluated, those that are preferred, and, if any negative performance was observed, those that should be avoided.

Dispersants

- While **Setal[®] 48-6093** has shown to be a very good pigment wetting resin, it may be necessary to incorporate additional dispersants to improve upon pigment flood & float. In lab testing, **ADDITOL[®] XW 395** has been found to be an ideal choice for such, without detracting from other performance criteria.
- As seen in SPF #1777, **ADDITOL[®] XW 6588** has been used for optimal dispersion of Titanium Dioxide, without negative effect on dry speed.

Defoamers

- Where defoaming agents are required for certain applications, **ADDITOL[®] VXW 4973**, **ADDITOL[®] XW 6569**, Airex 901W (Evonik), and Dowsil 65 (Dow) have been found effective, while not deterring from other performance aspects.

Driers

- Combination driers, such as **ADDITOL[®] VXW 6206**, have been found to provide optimal dry speed, with a level of 3% drier (as supplied) on resin solids recommended.

Rheological Modifiers

- In coatings requiring viscosity increase, Acrysol RM-8W (Dow) and Optiflo L-100 (Byk Chemie) have been used effectively.
- When increased sag resistance is necessary, **ADDITOL[®] XW 6574**, Acrysol RM-2020 (Dow), and Optiflo TVS-VF (Byk Chemie) can be used effectively.

Surface Additives

- Among those flow and leveling additives found efficient, **MODAFLOW[®] AQ-3025** and **ADDITOL[®] XW 395** are preferred.
- For improved substrate wetting of compromised surfaces, **ADDITOL[®] XW 6580** and **ADDITOL[®] XW 390** have been found effective

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