

Functional Additives

RHODOLINE® OTE-500: OPEN-TIME ADDITIVE

RHODOLINE® OTE-500 is a novel APE and solvent free open time additive for low to VOC-free waterborne paints, coatings, inks and adhesives.

RHODOLINE® OTE-500 improves open time for low to VOC-free waterborne paints. It could be utilized in various formulations from low to high gloss paints.

RHODOLINE® OTE-500 significantly improves open time for paints made with the following resin systems:

- ▶ All-Acrylic copolymer
- ▶ Styrene-Acrylic copolymer (S/A)
- ▶ Vinyl Acetate / Acrylic copolymer (V/AC)
- ▶ Vinyl Acetate / Ethylene Copolymer (EVA)
- ▶ Water-based Alkyd Paints

RHODOLINE® OTE-500 works in all gloss: high gloss, semi-gloss, satin and flat (matte) systems

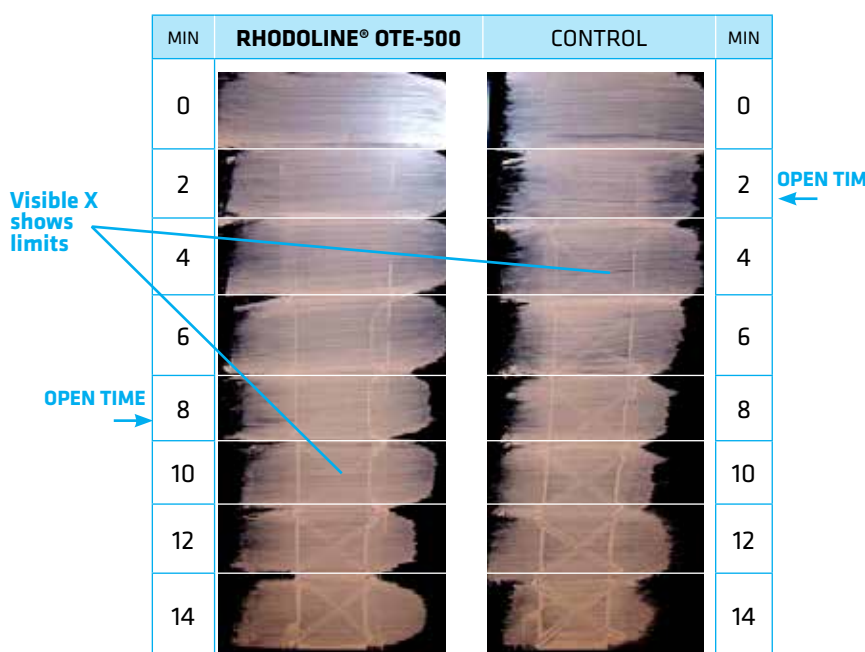
Key Features

- ▶ Extends open time
- ▶ Exhibits excellent dispersion stability
- ▶ Allows formulation of Eco-label compliant coatings
- ▶ May reduce/eliminate wetting agents

Sustainable Additives

- ▶ APE-free and VOC-free additive
- ▶ Low odor solution
- ▶ Enables design of low to VOC-free coating formulations
- ▶ Design sustainable coatings with RHODOLINE® OTE-500 [Green Seal (GS-11) or EU Ecolabel compliant paints]

PAINT SAMPLE	CONTROL	RHODOLINE® OTE-500
VOC-free ACRYLIC SG PAINT	2	8



PRODUCT NAME	DESCRIPTION	Application Guideline								International Inventory Status					
		APE-Free	VOC-Free	Flat to semi-gloss paints	High Gloss	Elastomers / Roof coatings	Traffic Marking Paints	Inks	Adhesives	USA (TSCA)	CANADA (DSL)	EUROPE (EINECS)	AUSTRALIA (AICS)	SOUTH KOREA (KECL)	JAPAN (MITI)
RHODOLINE® OTE-500	APE-free and VOC-free additive that promotes extended open time	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

◆ Listed



Low VOC Acrylic Semi-Gloss Paint

LOW VOC SEMI-GLOSS PAINT FORMULA	A	B	C
	CONTROL PAINT	RHODOLINE® OTE-500 + RHODOLINE® 5520	RHODOLINE® OTE-500
Raw Materials	Wt. %	Wt. %	Wt. %
Water	7.75	7.75	7.75
RHODOLINE® 286N - dispersant	0.78	0.78	0.78
RHODOLINE® 643 - defoamer	0.05	0.05	0.05
RHODOLINE® 5520 - wetting agent	0.39	0.39	0.00
RHODOLINE® OTE-500	0.00	0.00	0.39
Amine	0.19	0.19	0.19
Attagel 50	0.48	0.48	0.48
Titanium Dioxide	22.29	22.29	22.29
Water	8.67	8.67	8.67
Acrylic Latex (50%)	46.52	46.52	46.52
RHODOLINE® OTE-500	0.00	1.21	0.82
RHODOLINE® 643	0.19	0.19	0.19
High Shear Builder (ICI)	2.23	1.65	1.94
Water	9.21	8.61	8.56
Low Shear Builder (Ku)	0.85	0.82	0.97
Mildewcide	0.39	0.39	0.39
Total	100	100	100

PVC = 22.2%; Weight Solids = 45.4%; Volume Solids = 32.4%

For optimum results use **RHODOLINE® OTE-500** as shown in formulation C above by splitting the quantity in the grind to replace the wetting agent and in the letdown. **RHODOLINE® OTE-500** increases the open time with minimal impact on dry film properties.

PAINT PROPERTIES TESTED	CONTROL PAINT	RHODOLINE® OTE-500 + RHODOLINE® 5520	RHODOLINE® OTE-500
Non-Ionic Surfactant R5520 - %	0.39	0.39	0.00
RHODOLINE OTE-500 - %	0.00	1.21	1.21 (0.39 + 0.82)
Gloss O/N 20°/60°/85	21/56/91	27/61/89	23/57/89
Freeze/Thaw - 5 Cycles - ΔKu	Fail-1	16	14
Open Time - Minutes ASTM D7488	2	8	8
Scrub Resistance ASTM D2486	>1000	555	>1000
Block Resistance ASTM D4946	Control	-	-
Color Rub-up ΔE - BLK (1.6% by volume)	0.53	0.79	0.65
Heat Aged - 2 wks @ 50°C - Δ KU	-1	4	0
Stain Resistance ASTM D4828	Control	=	=
Surfactant Leaching - O/N Dry	8	9	9
Low Temp FF, 5°C - Sealed/Unsealed	10/10	8/10	10/10

Rating System: 10 = Best; 0 = Worst

Functional Additives

RHODOLINE® FT-100: FREEZE-THAW STABILITY ADDITIVE

Freeze-Thaw Process

Freezing of Latex Polymers (to -18°C)



RHODOLINE® FT 100 is a unique APE-free and solvent-free additive utilized to improve freeze-thaw stability primarily for low Tg latex binders as well as waterborne paints formulated with these binders. RHODOLINE® FT 100 also improves gloss, pigment dispersions and stain resistance in these formulations.

Key Features

- ▶ Delivers freeze-thaw stability
- ▶ Enhances gloss
- ▶ Boosts stain resistance
- ▶ APE-free and VOC-free

Easy to use for a wide range of polymers

- ▶ All Acrylic
- ▶ Vinyl / Acrylic
- ▶ Styrene / Acrylic
- ▶ Ethylene vinyl acetate

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RHODOLINE® FT-100	APE-free and VOC-free additive that promotes freeze-thaw stability	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

◆ Listed



Effects of RHODOLINE® FT-100 on Freeze-Thaw Stability of Low VOC Commercial PAINT

Commercial all acrylic gloss paint (VOC= 50 g/l/ASTM)	Initial Viscosity (KU)	1 Cycle	2 Cycle	3 Cycle	4 Cycle	5 Cycle	Usage levels in paint formulations
RHODOLINE® FT 100	102.4	103.8.	104.3	104.0	105.4	105.4	1.0%
No additive	121.1	gel	paint coagulated				–
Ethylene Glycol	103	gel	paint coagulated				1.0%
Alkyl Phenol Ethoxylate	88	gel	paint coagulated				1.0%
Linear Alkyl Ethoxylate	96	gel	paint coagulated				1.0%

