EASTMAN

Eastman Texanol™ ester alcohol

Meeting the revised EU Ecolabel for indoor and outdoor paints

Introduction

Eastman Texanol™ ester alcohol has been used extensively as a high-performing coalescent for many years.

The current criteria for awarding the EU Ecolabel to paints has recently been revised to include a requirement to measure and report both VOC (volatile organic compounds) and now also SVOC (semi-volatile organic compounds).

While the definition of a VOC remains unchanged, the revised Ecolabel defines an SVOC as any organic compound having a boiling point greater than 250°C and in a capillary column[1] eluting with a retention range between *n*-pentadecane ($C_{15}H_{32}$) to *n*-docosane ($C_{22}H_{46}$) for nonpolar systems and diethyl adipate ($C_{10}H_{18}O_4$) to methyl palmitate ($C_{17}H_{34}O_2$) for polar systems.

When Texanol is tested by GC, using the method given in ISO 11890-2, it will be captured as an SVOC under the revised criteria.

The revised Ecolabel sets limits for in-can SVOC at 30 g/L for white indoor paints and 40 g/L for tinted outdoor paints. **The purpose of this study was to demonstrate that traditional matt and silk paints formulated with Texanol can easily meet the limits for SVOC content set out in the revised Ecolabel criteria**.

Formulation details

Matt and silk paints were formulated based on a styrene acrylic binder, Acronal™ S790, from BASF. These formulations are detailed in Tables 3 and 4.

In-can SVOC testing

The in-can SVOC content was tested in accordance with ISO 11890-2, which is referred to in the revised Ecolabel document.

The method is detailed in the appendix.

The SVOC results were converted from % w/w to g/L using the following calculation:

$$\frac{\textbf{1000 x Density (g/ml) x SVOC (\%wt./wt.)}}{\textbf{100}} = \textbf{SVOC (g/L)}$$

[1]*As specified in 8.2.2 of FprCEN/TS 16516.*

Results

Table 1. In-can SVOC (g/L) of paints tested

Paint	SVOC (g/L)
Matt with Texanol	15.8
Silk with Texanol	23.1

The results indicate that traditional paints formulated with Eastman Texanol™ ester alcohol can comfortably meet the limits for SVOC content outlined in the revised Ecolabel.

Influence of colourant on overall SVOC content of a wall paint

Eastman also evaluated a customer paint formulation with a high level of colourant to determine what effect the colourant would have on the final SVOC content of the paint.

The results tabulated in Table 2 show that the colourant used in the customer paint formulation contributed a very small amount of SVOC to the paint thus the test paint was well within the 40 g/L limit for a tinted interior wall paint.

Table 2. Influence of colourant on overall SVOC content of a wall paint

	Tinted	No tint
SVOC	6.3 g/L	1.3 g/L

**79 grams of colourant in 1 liter of paint*

In situations where customers are looking to formulate paints with minimal SVOC content, Eastman can also offer Eastman Optifilm™ enhancer 400. Refer to document *http://www.eastman.com/Literature_Center/T/TTEU143.pdf* where it is shown that this product is a non-VOC under the Ecolabel criteria.

Conclusion

This study clearly demonstrates that Texanol can be used in traditional matt and silk paints whilst comfortably meeting the SVOC limits of the Ecolabel criteria.

Appendix

Table 3. Matt wall paint

Matt paint	Eastman Texanol™ ester alcohol	Type
Pigment grind		
Deionized water	108.10	
Dispex™ A40	5.40	Pigment dispersant
Ammonia (25%)	1.10	Neutralizing agent
Acticide™ MBS	2.20	Biocide
Foamaster™ NDW	2.20	Antifoam
Tiona™ 595	104.80	Pigment
Snowcal™ 70	325.20	Filler
Satintone™ 5HB	55.70	Filler
Letdown		
Bermocoll™ E 320 FQ** (3% solution in deionized water)	229.00	Cellulose thickener
Deionized water	1.20	
Sodium benzoate	1.10	Corrosion inhibitor
Acronal™ S790	153.40	Styrene acrylic polymer
Eastman Texanol™ ester alcohol	10.70	Coalescent
Total	**1000.00**	
PVC %	70%	
SG	1.48	
SVOC (g/L)	15.84	

Table 4. Silk wall paint

Silk paint	Eastman Texanol™ ester alcohol	Type
Pigment grind		
Deionized water	111.50	
Dispex™ GA40	3.00	Pigment dispersant
Ammonia (25%)	1.00	Neutralizing agent
Acticide™ MBS	2.00	Biocide
Foamaster™ NXZ	1.00	Antifoam
Tiona™ 595	192.10	Pigment
Microdol H6000	39.40	Filler
Letdown		
Bermocoll™ E 320 FQ (3% solution in deionized water)	151.60	Cellulose thickener
Deionized water	0.00	
Sodium benzoate	1.00	Corrosion inhibitor
Foamaster™ NXZ	1.00	Antifoam
Vertec™ AT33	3.00	Rheology additive
Ropaque™ Ultra	70.80	Opaque polymer
Acronal™ S790	400.30	Styrene acrylic polymer
BYK™ 348	2.30	Wetting/leveling aid
Eastman Texanol™ ester alcohol	20.00	Coalescent
Total	**1000.00**	
PVC %	25%	
SG	1.16	
SVOC (g/L)	23.08	

Method

Each paint was weighed (1.5 g) into 10 mL of acetone containing 0.1% w/v octanol internal standard in duplicate. The mixture was shaken vigorously, sonicated for 5 minutes, and shaken again before the solids were allowed to settle. The supernate was then analyzed by GC-FID against standards containing Texanol ester alcohol and octanol internal standard.

GC conditions:

Agilent 7890A GC

Column: DB-1301 60 m x 0.32 mm x 1.0 µm

Carrier gas: Helium with inlet pressure 18 psi

Inlet and FID: 280°C

Split ratio: 40:1

Temperature program: 100°C for 1 min then 20°C/min ramp up to 260°C and 60 min hold

Retention time markers: Diethyl adipate and methyl palmitate for upper limits of VOC and SVOC, respectively

Method based on Annex B.1 in ISO 11890-2

Refer to Tables 5 and 6 for GC results.

Table 5. GC results matt wall paints (% w/w)

	SVOC	Total SVOC
Component	Texanol	Texanol and other ingredients
Amount	1.07	1.1

Table 6. GC results silk wall paints (% w/w)

	SVOC	Total SVOC
Component	Texanol	Texanol and other ingredients
Amount	1.99	2.0

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