

Meeting the emission standards of the compulsory French labelling scheme “Grenelle de l’environnement” with Eastman coalescing aids

Eastman Texanol™ ester alcohol and Eastman Optifilm™ enhancer 300 have been used extensively as high-performing coalescents for many years. The European Directive on volatile organic compounds (EC2004/42) defines VOC as “any organic compound having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101.3 Kpa.” Texanol has an initial boiling point of 254°C, and Optifilm 300 has an initial boiling point of 281°C. Consequently, Texanol and Optifilm 300 are not VOCs as defined by this directive.

The recent French regulation (*Grenelle de l’environnement*) regarding the mandatory labelling of construction products that are installed indoors, including floor and wall coverings, paints, and lacquers, has been approved. The mandatory labelling is based on emission testing after 28 days via ISO 16000. The higher the emission, the less favorable the classification. The French regulation allows emission evaluations via a chamber method (ISO 16000-9) or via the FLEC® (Field Laboratory Emission Cell) method (ISO 16000-10).

The regulation foresees that from 1 Jan. 2012, any new product that is placed on the market has to be labelled in accordance with the level of emission produced. Products that are currently sold in the French market need to be labelled from 1 Sept. 2013. The limit values for the emission classes, as well as the listed substances and an example of the label, are listed in Appendix 1.

This document details the independent emission evaluations of architectural wall paints containing Texanol and Optifilm 300 that were conducted in accordance with the French regulations. These independent evaluations were carried out at Eurofins.

Formulation details

Matt and satin wall paints were prepared based on a styrene acrylic binder, Acronal™ S 790 from BASF. These formulations are detailed in Appendix 2. Texanol and Optifilm 300 were added separately to the paints. The emissions were evaluated by Eurofins in accordance with ISO 16000. A film of 100 microns was applied onto a glass plate and transferred to a stainless steel test chamber which had a volume of 119 litres.

- *Formulations containing Texanol and Optifilm 300 have achieved excellent TVOC emission ratings of <1000 µg/m³, enabling an A+ emission rating label in matt and silk paints.*
- *The listed substances were all less than 5 µg/m³, giving an A+ rating label.*

Conclusion

The ultimate emission profile of any coating will be formulation dependant, and therefore, all relevant paints should be evaluated to ensure the correct emission label is applied. The independent evaluations in this document show that Eastman Texanol™ ester alcohol and Eastman Optifilm™ enhancer 300 can comply with the latest French (*Grenelle de l’environnement*) mandatory emission labelling of construction products that are installed in interior environments.

It has been demonstrated that it is possible to formulate matt and satin architectural paints with an A+ label rating for both emission and the principal substances detected.

Wall paint	Coalescent	TVOC after 28 days (µg/m ³)*	Label for emission	Listed substances	Label for listed substances
Matt	Eastman Texanol™ ester alcohol	14	A+	All <5 µg/m ³	A+
Matt	Eastman Optifilm™ enhancer 300	360	A+	All <5 µg/m ³	A+
Satin	Eastman Texanol™ ester alcohol	340	A+	All <5 µg/m ³	A+
Satin	Eastman Optifilm™ enhancer 300	700	A+	All <5 µg/m ³	A+

*Evaluations carried out by Eurofins using a chamber test method (ISO 16000-9)

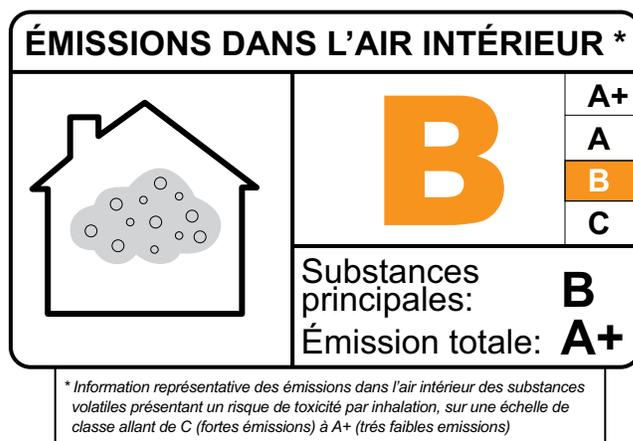
Appendix 1

Emission classifications to “Grenelle de l’environnement” regulations

Classes	C	B	A	A+
Formaldehyde	>120	<120	<60	<10
Acetaldehyde	>400	<400	<300	<200
Toluene	>600	<600	<450	<300
Tetrachloroethylene	>500	<500	<350	<250
Xylene	>400	<400	<300	<200
1,2,4-Trimethylbenzene	>2000	<2000	<1500	<1000
1,4-Dichlorobenzene	>120	<120	<90	<60
Ethylbenzene	>1500	<1500	<1000	<750
2-Butoxyethanol	>2000	<2000	<1500	<1000
Styrene	>500	<500	<350	<250
TVOC	>2000	<2000	<1500	<1000

The emission label

The label on the products includes two small letters indicating (A) the highest (worst) class of the listed individual substances and (B) the TVOC class. A large letter indicates the highest (worst) class of both assignments. There are detailed rules on how the label has to look. An example follows.



Appendix 2

Table 1. Matt wall paint

Matt paint	Eastman Texanol™ ester alcohol	Eastman Optifilm™ enhancer 300	Type
Pigment grind			
Deionised water	12.0	12.0	
Dispex™ A40 ^a	0.5	0.5	Pigment dispersant
Ammonia (25%) ^b	0.1	0.1	Neutralising agent
Acticide™ MBS ^c	0.2	0.2	Biocide
Foamaster™ NDW ^d	0.2	0.2	Antifoam
Tiona™ 595 ^e	9.7	9.7	Pigment
Snowcal™ 70 ^f	21.4	21.4	Filler
Satintone™ 5HB ^a	5.1	5.1	Filler
Letdown			
Bermocoll™ E 320 FQ (3% solution in deionised water) ^g	21.2	21.2	Cellulose thickener
Deionised water	6.16	6.16	
Sodium benzoate ^b	0.1	0.1	Corrosion inhibitor
Ropaque™ Ultra ^h	7.0	7.0	Opaque polymer
Acronal™ S 790 ^a	14.2	14.2	Styrene acrylic polymer
Acrysol™ TT-935 ^h	1.0	1.0	Associative thickener
Eastman Texanol™ ester alcohol ⁱ	1.14	0	Coalescent
Eastman Optifilm™ enhancer 300 ⁱ	0	1.14	Coalescent
Total	100	100	
PVC	73.6%	73.6%	
VOC (g/litre) Decopaint Directive 2004/42/EC	1.3	1.3	

^aBASF ^bAldrich Chemicals ^cThor ^dOxy process ^eMillennium Chemicals ^fOmya ^gAkzoNobel ^hDow ⁱEastman Chemical Company

Table 2. Satin wall paint

Matt paint	Eastman Texanol™ ester alcohol	Eastman Optifilm™ enhancer 300	Type
Pigment grind			
Deionised water	8.2	8.2	
Dispex™ GA40 ^a	0.3	0.3	Pigment dispersant
Ammonia (25%) ^b	0.1	0.1	Neutralising agent
Acticide™ MBS ^c	0.2	0.2	Biocide
Tiona™ 595 ^d	19.0	19.0	White pigment
Microdol™ H600 ^e	3.0	3.0	Filler
Letdown			
Bermocoll™ E 320 FQ (3% solution in deionised water) ^f	15.0	15.0	Cellulose thickener
Propylene glycol (100%) ^b	3.0	3.0	Open time additive (volatile)
Deionised water	1.79	1.79	
Sodium benzoate ^b	0.1	0.1	Corrosion inhibitor
Foamaster™ NXZ ^g	0.1	0.1	Defoamer
Vertec™ AT33 ^h	0.3	0.3	Chelate thickener
Ropaque™ Ultra ⁱ	7.0	7.0	Opaque polymer
Acronal™ S 790 ^a	39.6	39.6	Styrene acrylic polymer
BYK™ -348 ^j	0.23	0.23	Wetting/levelling
Eastman Texanol™ ester alcohol ^k	1.98		Coalescent
Eastman Optifilm™ enhancer 300 ^k		1.98	Coalescent
Total	100	100	
PVC	45%	45%	
VOC (g/litre) Decopaint Directive 2004/42/EC	40	40	

^aBASF ^bAldrich Chemicals ^cThor ^dMillennium Chemicals ^eOmya ^fAkzoNobel ^gOxy Process ^hJohnson Matthey ⁱDow ^jBYK Chemie ^kEastman Chemical Company



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