REFERENCES

Order :	**YOUR AGREEMENT**
Offer :	DR12-1481
Received the,	**03/16/12**
Contact:	**M BOURGOIS Eric**
ClientID:	
Description:	
Nature:	**PAINT**
Comment:	

SAS CD PEINTURES
9 AVENUE DU VERT GALANT
BP 37056
95052 CERGY PONTOISE
FRANCE

Saint Etienne du Rouvray, the 05/29/2012

ESSAY REPORT
RN12-04960-B Page 1/7

Sanitary evaluation of the emissions of volatile compounds by the paint.

I.Sample description.

Sample reference	Description	Photos	Date of reception
RN12-04960.001	PEINTURE LUCITE ALL IN ART 340977		03/16/12

II.Purpose of the analyses.

The purpose of the test is to qualify the discharge of volatile organic compounds VOC and aldehyde (including formaldehyde) emitted from paints, as well as proceeding with the sanitary evaluation in accordance to European protocol referenced ECA/IAQ (1997). Each paint is qualified on the basis of its emissions, according to the criteria determined in the decrees of April 19th, 2011, May 28th, 2009 and April 30th, 2009.

REFERENCES
NF EN ISO 16000-9: Ambient air – Part 9: measure of the discharge of VOC in construction and equipment products – AFNOR method of 2006: chamber of tests of emissions

NF EN ISO 16000-11: Ambient air – Part 11: measure of the discharge of VOC in construction and equipment products – sampling, conservation of samples and preparation of samples prior to testing (AFNOR, 2006).

NF ISO 16000-3 : Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds — Active sampling method (AFNOR, 2011)

NF ISO 16000-6 : Indoor Air – Partie 6 : Determination of volatils organics compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID. (AFNOR, 2012).

ECA/IAQ 1997 : European Collaborative Action, Indoor Air Quality & its Impact on Man, Report n° 18: Evaluation of VOC Emissions from Building Products – Solid Flooring Materials (EUR 17334EN).

Arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2 (*Trichloréthylène No de CAS : 79-01-6*)

Arrêté du 28 mai 2009 modifiant l'arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2.
(*Benzène, CAS 71-43-2 ; Phtalate de bis(2-éthylhexyle), CAS 117-81-7 ; Phtalate de dibutyle, CAS 84-74-2*)

Décret no 2011-321 du 23 mars 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants. Les limites en fonction des étiquetages sont résumées ci-dessous :

Arrêté du 20 février 2012 modifiant l'arrêté du 19 avril 2011 relatif à l'étiquetage des produits de construction ou de revêtement de mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils

CLASSES	C	B	A	A+
Formaldéhyde	> 120	< 120	< 60	< 10
Acétaldéhyde	> 400	< 400	< 300	< 200
Toluène	> 600	< 600	< 450	< 300
Tétrachloroéthylène	> 500	< 500	< 350	< 250
Xylène	> 400	< 400	< 300	< 200
1,2,4-Triméthylbenzène	> 2000	< 2000	< 1500	< 1000
1,4-Dichlorobenzène	> 120	< 120	< 90	< 60
Ethylbenzène	> 1500	< 1500	< 1000	< 750
2-Butoxyéthanol	> 2000	< 2000	< 1500	< 1000
Styrène	> 500	< 500	< 350	< 250
COVT	> 2000	< 2000	< 1500	< 1000

III. Analysis.

1) Preparation of the test-tube:

The test-glass sheets have been painted on one side with a thickness of 90µm (each test- glass sheets contains a sheet of glass with two bands of paint). The test-glass sheets have then been placed inside the emission chamber.

2) Conditioning inside the emission chamber:

The test-tubes have been placed inside a glass emission chamber of 51 liter-volume. The testing parameters retained are described in the chart below (these parameters are almost the same as in standard NF EN ISO for the "wall" emission scenario).

Essay parameters	Analytical Conditions
chamber of tests of emissions	CLIMPAQ (glass)
Volume of the chamber	0,051 m^3
Temperature	23 ± 2 °C
Relative humidity	50 ± 5 %
Surface painted by the test tube	0.0756m^2
Rate of air renewal	0,5 h^{-1}
Rate of load	1.48 $m^2.m^{-3}$
Rate of specific ventilation (qc)	0.34 $m^3.m^{-2}.h^{-1}$
Essay time	28 days
Number of coat	1

3) Conditions of VOC and aldehyde sampling:

The VOC and aldehyde sampling are done by pumping and retrieving on a specific absorbent support on a period of 28 days ± 2 hours.
Sampling conditions are described in the chart below:

Taking	Benzene + Trichloroethylene	COV + 9 substances		Aldehydes
Number of tubes	1	1	1	1
Absorbing support	Carboxen	Tenax	Tenax	TA DNPH
Time of taking	60 min.	6 min.	60 min.	60 min.
Flow	100 ml.min^{-1}	100 ml.min^{-1}	100 ml.min^{-1}	300 ml.min^{-1}
Surface of the sample	0,0756m²	0,0756 m²	0,0756 m²	0,0756 m²

4) Measurement method of VOC and aldehydes :

VOC sampling and analyses are performed according to standard NF ISO 16000-6.
Equipments used in our laboratory for this analysis are: a Markes “thermo-désorbeur” and an Agilent gas chromatographer with mass spectrometry for identification, and a flame ionization detector (FID) for quantification. Each individual component is quantified with a specific calibration.

The total VOC concentration is quantified, for eluent components from n-hexane to n-hexadecane (included), with a response factor of toluene.

Aldehyde sampling and analyses are performed according to standard NF ISO 16000-3.
Sampling is performed on cartridges containing silica gel with a concentration of 2,4 of dinitrophenylhydrazine (DNPH). In the laboratory, cartridges are eluated in 5ml of acetonitrile. Two injections of 20 µl of this eluent solution are then analysed with high performance liquid chromatography (HPLC), equipment from WATERS.

Aldehyde are qualified and quantified by specific calibration.

5) Résultats des essais à l'émission

The concentration results of samples are corrected by taking in consideration the value of the blank measured in the chamber before the samples.

The concentrations determined by considering the "wall" scenario, expressed in $\mu g.m^{-3}$, are presented in the charts below (for VOC and aldehyde, including formaldehyde).

Parameters	Units	RN12-04960.001	LOQ
Content of formaldehyde (CAS : 50-00-0) 28 jours	µg/m3	< LOQ	10
Content of Acetaldehyde (CAS : 75-07-0) 28 jours	µg/m3	< LOQ	10
Content of Toluene (CAS : 108-88-3) 28 jours	µg/m3	< LOQ	50
Content of Tetrachloroethylene (CAS : 127-18-4) 28 jours	µg/m3	< LOQ	20
Content of Xylenes (CAS : 1330-20-7; sum of m,p and o xylenes) 28 days	µg/m3	< LOQ	50
Content of 1,2,4-Trimethylbenzene (CAS : 95-63-6) 28 days	µg/m3	< LOQ	20
Content of 1,4 Dichlorobenzene (CAS : 106-46-7) 28 days	µg/m3	< LOQ	20
Content of Ethylbenzene (CAS : 100-41-4) 28 days	µg/m3	< LOQ	20
Content of 2-Butoxyethanol (CAS : 111-76-2) 28 days	µg/m3	< LOQ	50
Content of Styrene (CAS :100-42-5) 28 days	µg/m3	< LOQ	20
Content of COVT 28 days	µg/m3	< LOQ	500
Content of Benzene (CAS : 71-43-2) 28 days	µg/m3	< LOQ	1
Content of Trichloroethylene (CAS : 79-01-6) 28 days	µg/m3	< LOQ	1
Content of Dibutylphtalate (CAS : 84-74-2) 28 days	µg/m3	< LOQ	1
Content of Bis-(2Ethylhexyl)phtalate (CAS : 117-81-7) 28 days	µg/m3	< LOQ	1

IV.Conclusion.

The VOC have not been quantified above the limit of 1000 µg/m^3, the 10 substances mentioned in the decree were not quantified above the limits of A+ classification.

No phthalate, benzene or trichloroethylene were detected above the limits of the decrees of April 30th, 2009 and May 28th, 2009.

In conclusion, the sample analyzed is classified A+ according to decree n° 2011-321 of March 23rd, 2011, as well as decree of February 20th, 2012, concerning the labeling of construction products and wall or floor coating and paint or varnish for the quantification of their pollutants emission.

Approved by **Customer Project Manager**
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