



**HARRPA**

**Hydrocarbon Resins, Rosin Resins and Pine Chemicals  
Producers Association**

## **HARRPA STATEMENT ON Volatile Organic Compounds**

*The information contained in this document is intended for guidance only and whilst the information is provided in utmost good faith and has been based on the best information currently available, it is to be relied upon at the user's own risk. No representations or warranties are made with regards to its completeness or accuracy and no liability will be accepted by HARRPA nor any of its members for damages of any nature whatsoever resulting from the use of this information.*



The products manufactured by the HARRPA (Hydrocarbon Resins, Rosin Resins and Pine Chemicals Producers Association) members are used in many applications, e.g. (hot melt) adhesives, rubber, chewing gum, cosmetics, paints, tyres and food contact applications. Usually the resins do not represent the major component of the article or material. More information on products can be found on the HARRPA website<sup>1</sup>.

The purpose of this document is

- a) to provide the position of HARRPA with respect to the discussion on Volatile Organic Compounds (VOC) at different stakeholder's levels and also to improve the VOC-related technical discussion between suppliers and users,
- b) to clarify resin manufacturers' opinion on their regulatory obligations, and
- c) to identify the use of resins and the applicable respective legislations (both at national and EU levels) and voluntary schemes.

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<sup>1</sup> <http://www.cefic.org/About-us/How-Cefic-is-organised/Fine-Speciality-and-Consumer-Chemicals/Hydrocarbon-Resins-Rosin-Resins-And-Pine-Chemicals-Producers-Association-HARRPA/HARRPA-Applications/>

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## Statement on manufacturers' legal duties

At the date of the issue of this statement, it is HARRPA's understanding that:

- Hydrocarbon resins and rosin resins manufacturers are not legally required to make any statement or claim regarding either the VOC content or VOC emissions of their resins as supplied to their customers for subsequent downstream use.
- Current legal responsibilities for any declarations apply to those responsible for placing the final formulation containing the resins on the market.

**In this respect Hydrocarbon resins and rosin resins manufacturers, for business purposes, may decide to communicate VOC related information to their customers on a voluntary basis.**

More specific topics are reviewed in the annexes of this paper.

## References

<http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32004L0042>

[http://www.cepe.org/EPUB//easnet.dll/GetDoc?APPL=1&DAT\\_IM=10683C&DWNLD=130212%20Guideline%20DECO%20VOC%20Determination%20Final.doc](http://www.cepe.org/EPUB//easnet.dll/GetDoc?APPL=1&DAT_IM=10683C&DWNLD=130212%20Guideline%20DECO%20VOC%20Determination%20Final.doc).

<http://www.feica.com/library/position-papers/voc>

[http://www.mapei.com/public/IT/leed/publications/indoor%20air%20quality%202011\\_austin%20paper%202.pdf](http://www.mapei.com/public/IT/leed/publications/indoor%20air%20quality%202011_austin%20paper%202.pdf)

<http://www.afssa.fr/ET/PPNAD79.htm?pageid=714&parentid=424>

[http://www.eu-lci.org/EU-LCI\\_Website/Home.html](http://www.eu-lci.org/EU-LCI_Website/Home.html)

<http://www.esig.org/uploads/documents/81-518-voc%20definition%20in%20europe.doc>.

[http://www.esig.org/uploads/ModuleXtender/Publications/202/Guidance\\_Paper\\_ESVOC\\_Indoor\\_Air\\_Quality\\_-\\_Final\\_Dec2013.pdf](http://www.esig.org/uploads/ModuleXtender/Publications/202/Guidance_Paper_ESVOC_Indoor_Air_Quality_-_Final_Dec2013.pdf)

## ANNEX

### ANNEX 1 - Current European regulations and voluntary scheme on low VOC emissions

- CE marking - specifics on VOC declarations determined by harmonised product standards issued under a mandate under the Construction Products Regulation EC 305/2011 and its delegated acts
- French VOC regulations (ex AFSSET/ANSES<sup>2</sup>)
- German product approval and Ü marking for floor coverings and several more construction products.(Agbb-DIBt)
- Belgian VOC regulations
- Lithuanian Regulation on VOC emissions
- Decopaint Directive for VOC content

#### a) European regulations on low VOC emissions:

- **CE Marking under the Construction Products Regulation EC 305/2011**



The Construction Products Regulation (CPR) is designed to ensure reliable information is given for construction products in relation to their performances. This is achieved by providing a “common technical language”, offering uniform assessment methods of the performance of construction products. The Construction Products Regulation replaced the Construction Products Regulation (CPR) in 2011. The Essential Requirements covered by the CPR are:

1. Mechanical Resistance and Stability
2. Safety in case of Fire
3. Hygiene, Health and the Environment
4. Safety in Use
5. Protection against Noise
6. Energy, Economy and Heat Retention

These became six of the Basic Works Requirements under the CPR and one of the key new additions to the CPR is a requirement on sustainability, especially on the sustainable use of natural resources (Basic Works Requirement 7).

The emissions of Dangerous Regulated Substances is covered under BWR3<sup>3</sup>, and VOC emission is considered to be a regulated substance and so must be considered for the purposes of CE marking. For the purposes of ‘Regulated’ this is taken to mean any substance with an LCI (Lowest Concentration of Interest) and / or any hazardous substance.

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<sup>2</sup> ANSES : French Agency for Food, Environmental and Occupational Health & Safety. Anses has been created in 2010 by merging AFSSET and AFSSA. AFSSET was the French Agency for Environmental and Occupational Health and Safety,

<sup>3</sup> Basic Work Requirement : it relates to hygiene, health and environmental aspects

Unlike other Regulations, the CPR does not automatically cover all construction products. Individual product technical committees are given a mandate by the commission, requiring them to issue an harmonised product standard laying down the for CE marking requirements and the mandatory declaration of performance. Initially the mandates issued under the original CPR did not include a requirement to deal with BWR3 and until the mandates are revised, the current harmonised product standards generally do not cover emissions. As the existing mandates are amended the CEN Technical Committees will be required to amend the standards and explain how the products shall be tested for emissions, using the horizontally mandated test method developed by TC351 (currently a Technical Specification, CEN TS 16516, in the process of being translated into a test standard (EN)). As part of this process a VOC class scheme has been proposed but has not yet been finalised or approved by the member states.

- **DecoPaint Directive**

The European "Decopaint" Directive (2004/42/EC) limits the total content of VOCs in certain paints and varnishes and in vehicle refinishing products in order to reduce the VOC emissions leading to a reduction in the generation of ozone in the lower atmosphere. The next revision is assumed to include more product groups, but the expected revision timing is unclear.

Any paint, varnish and vehicle refinishing product must not exceed the maximum VOC contents limit values as specified in the Directive. The limit values are for the ready to use product and the product must carry a label showing the type of product as given in the Directive, and the contents of VOC in g/l of the product in a ready to use condition.

The VOC content is measured in Europe by direct injection into a gas chromatograph (ISO 11890-2). Reactive products are allowed to stand open for 1 hour after mixing before the start of the test to allow initial curing to take place. The VOC content is determined as total volatiles by monitoring weight loss during 1 hour heating at 110 °C (ISO 11890-1/ ISO 11890-2 depending on solvent content). In both cases no subtraction of water or exempt compounds is performed. ISO 17895 can be used when VOC content is expected between 0.01 and 0.1%.

The VOC limits set in the Directive relate to the ready for use product so as resin suppliers there is no obligation to be compliant with the Decopaint Directive. For practical reasons the (maximum) VOC content of a product can be calculated by the final formulators.

- The maximum VOC should be calculated based on any recommended additions of, for example, colorants and thinners. For this calculation data supplied by the raw material suppliers will be used: solids content, VOC content (using similar ISO methods) and density, etc...

For more details, please refer to the CEPE<sup>4</sup> guidance 'Guideline for VOC (Volatile Organic Compound) determination for the Decorative paint industry.

In such case and on a voluntary basis formulators and raw material suppliers may share informations together (or *via* an external laboratory performing the evaluation (if necessary)).

## b) National regulations on low VOC emissions:

### • French VOC Regulation

The French Decree (Regulation) was published on 25 March 2011 with details published on 13 May 2011 regarding a mandatory labelling of construction products installed indoors, floor and wall coverings, paints and lacquers with their emission classes based on emission testing.

The products covered currently by the French Decree are:

- Walls, ceiling, floor coverings and coatings,
- Panels for rooms partition and suspended ceiling
- Insulation products,
- Doors and windows,
- All products used for the installation of the products listed above.

The Decree came into effect on 1<sup>st</sup> January 2012 and means that any covered product placed on the market has to be labelled with an emission class based on their emissions after 28 days, as tested with ISO 16000 and calculated for a European reference room. Existing products had until September 2013 to comply with this. The emissions class will be assigned and **self-declared** by the manufacturer or the distributor. The label on the products includes a letter indicating the highest (worst) emissions class of the listed individual substances and the TVOC. There is no upper limit. Class C reflects performance higher than the limits for substances set by class B.

In addition to this regulatory requirement, the ex-AFSSET/ANSES agency published a guideline (Protocole AFFSET<sup>5</sup>) for limiting VOC emissions into indoor air. This guideline should not be confused with the French regulation on VOC emissions described above. The AFSSET guideline is not the regulation but rather a non-binding guidance that may be used or not, depending on what the market requirements.

### • German VOC Regulation

The German Ü mark for construction products is administered by German DIBt (German Institute for Construction Technology)/AgBB and shows that the Ü marked product conforms to additional specifications if European CE marking does not cover all necessary information for German authorities.

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4 The European Council of Paint, Printing Inks and Artists' Colours Industry

5 See references



The regulation has recently been subject to EU court procedures, as the Commission felt that the regulation was a barrier to trade and that even if the CE marking did not cover all of the information it was not up to individual Member States to put a regulation in place to fill the gap. It is unclear how DiBT will respond to this recent court ruling against them, or how/if they will amend their regulation to comply. Successful application for the approval and the Ü mark is a prerequisite for entering the German market - but only for the covered products

- **Belgian VOC Regulation**

The Royal Decree establishing threshold levels for the emissions to the indoor environment was published on Aug 18, 2014. It covers:

- floor coverings,
- floor covering adhesives and
- surface coatings for wooden flooring

The regulation becomes mandatory from 1<sup>st</sup> January 2015 for products to be traded on the Belgian market for the first time. There is a transition period until 1<sup>st</sup> September 2015 for products placed on the market before 1<sup>st</sup> September 2014. Manufacturers are responsible for ensuring that their products meet or fall below the limit values and are responsible for having the required product emission files available.

Approvals by an official body are not required nor is there an official label. Laboratory tests have to be performed by an ISO 17024 accredited test lab following the new horizontally mandated European emission testing method CEN TS 16516.

The emissions are measured after 28 days but are more comprehensive for Belgium than the ex-AFSSET/ANSES German DIBt and AgBB measurement results can be used.

- **Lithuanian Regulation on VOC emissions**

A new draft regulation was notified to the EU Commission under the number 2014/530/LT. It is named "Draft amendment of Order No V-895 by the Minister for Health of the Republic of Lithuania of 9 December 2004 approving Lithuanian Hygiene Norm HN 105:2014 "Polymer construction products and polymer furniture materials". After the so-called standstill period on 4<sup>th</sup> May 2015, the text is intended to be transferred into a final regulation.

The draft regulation is an interpretation of the European Construction Products Regulation regarding VOC emissions from construction products into indoor air. The draft regulation will be obligatory for legal and natural persons who manufacture and supply concerned products to the market of the Lithuanian Republic.

## General

It should be noted that the same reference room is used in Germany and in Belgium, so existing test data for German or for draft Belgian regulation can be used for assigning an emission class, without new tests and without conversion of the test results. The same holds true for EMICODE<sup>6</sup>, GUT<sup>7</sup> and Blue Angel<sup>8</sup>. Also other valid information can be used as basis for this assignment of class, such as tests based on ISO 16000, but with shorter testing duration.

Except for the case of the Decopaint Directive, no communication on VOC content nor emission is expected between formulators and resin manufacturers for the purpose of being compliant with the EU or national regulation.

### c) Voluntary Declaration schemes in Europe on low VOC emissions:

In addition to regulatory requirements there are also voluntary schemes that manufacturers may wish to declare:

- Ecolabels and quality labels: eg EMICODE, GUT, Blue Angel, AgBB<sup>9</sup>

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<sup>6</sup> <http://www.emicode.com/index.php?id=1&L=1>

<sup>7</sup> <http://pro-dis.info/about-gut.html?&L=0>

<sup>8</sup> <https://www.blauer-engel.de/en/home>

<sup>9</sup> <http://www.rakennustieto.fi/index/english/emissionclassificationofbuildingmaterials.html>


## ANNEX 2: VOC definitions & methods

### Main existing VOC and VOC-related definitions – all sectors:

<b>WHO classification, 1989</b>		
VVOC Very Volatile (gaseous) Organic Compounds	BP (°C) : <0 to 50-100	
VOC Volatile Organic Compounds	BP (°C) : 50-100 to 240-260	
SVOC Semi Volatile Organic Compounds	BP (°C) : 240-260 to 380- 400	
<b>EC Directive 1999/13/EC (Solvent Emissions Directive)</b>		
VOC	<p>Volatile Organic Compounds (VOCs) are functionally defined as organic compounds having at 293.15 K (i.e., 20°C) a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under particular conditions of use.</p>	

<b>VOC emission testing</b>		
<b>Type of VOC</b>	<b>Definition</b>	<b>Method</b>
VOC  Source: ISO 16000-6	Any organic compound whose boiling point is in the range from (50 °C to 100 °C) to (240 °C to 260 °C),	ISO 16000 (1 to 11)  CEN/TS 16516 (based on ISO 16000) will be implemented as CEN/EN

(= WHO classification) and in forth-coming new EN standard (TC 351 : 16516	corresponding to having saturation vapour pressures at 25 °C greater than 100 kPa.	16516 in the future revisions”
TVOC (Total VOC)  Source: ISO 16000-6 and in forth-coming new EN standard (TC 351 : 16516	Sum of volatile organic compounds, sampled on Tenax TA, which elute from a non-polar or slightly polar gas chromatographic separation column between and including n-hexane and n-hexadecane (n-C6 – n-C16), quantified as toluene equivalent (meaning as if it were toluene). Only Germany uses a slightly different definition.	ISO 16000 (1 to 11)  Project CEN 16516 (based on ISO 16000)  TVOC-FID or TVOC-MS
California specification <a href="#">Section 01350</a>	Carbon-containing compounds (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonates and ammonium carbonate) with vapor pressures at standard conditions approximately ranging between those for n-pentane through n-heptadecane (n-C5 – n-C17). For the purposes of practice Section 01350, formaldehyde and acetaldehyde are considered to be VOCs	
<b>VOC Content</b>		
VOC  Source: European Decopaint Directive (Directive 2004/42/EC)	VOC is any organic chemical with boiling point below 250 °C at a standard atmospheric pressure of 101.3 kPa. To be given as grams VOC per liter product.	- Determination: Weight loss of a thin layer during 1 h at 110 °C; ISO 11890-1 (VOC>15%)  or extraction, then GC; ISO 11890-2 -VOC >0,1 and <

	<p>VOC content means the mass of volatile organic compounds, expressed in grams/litre (g/l), in the formulation of the product in its ready to use condition. The mass of volatile organic compounds in a given product which react chemically during drying to form part of the coating shall not be considered part of the VOC content;</p>	<p>15%)</p> <ul style="list-style-type: none"> <li>- Dispersion paints: Headspace-In-can testing; ISO 17895 :VOC &gt; 0,01% and &lt; 0,1% - not mentioned directly in ISO 11890</li> </ul>
<p>VOC</p> <p>Source: EU Ecolabel for indoor and outdoor paints and varnishes (Commission Decision of 28 May 2014)</p> 	<p>means any organic compounds having an initial boiling point less than or equal to 250 °C measured at a standard pressure of 101,3 kPa as defined in Directive 2004/42/EC (DecoPaint) and which, in a capillary column, are eluting up to and including Tetradecane (C<sub>14</sub>H<sub>30</sub>) for non-polar systems or Diethyl adipate (C<sub>10</sub>H<sub>18</sub>O<sub>4</sub>) for polar systems;</p>	<p>methods given in ISO 11890-2 or ISO 17895 that demonstrates compliance or a declaration of compliance supported by calculations based on the paint ingredients and raw materials</p>
<p>SVOC</p> <p>Source: EU Ecolabel for indoor and outdoor paints and varnishes (Commission Decision of 28 May 2014)</p>	<p>means any organic compound having a boiling point of greater than 250 °C and which, in a capillary column (1) are eluting with a retention range between n-Tetradecane (C<sub>14</sub>H<sub>30</sub>) and</p> <p>n-Docosane (C<sub>22</sub>H<sub>46</sub>) for non-polar systems and diethyl adipate (C<sub>10</sub>H<sub>18</sub>O<sub>4</sub>) and methyl palmitate (C<sub>17</sub>H<sub>34</sub>O<sub>2</sub>) for</p>	<p>either a test report using the method given in ISO 11890-2 or a declaration of compliance supported by calculations based on the paint ingredients and raw materials.</p>

	polar systems;	
<b>Other definition</b>		
NVOC Non-VOC	Any organic compound not volatile enough to be detected as vapour-phase constituent of indoor air.	-

## ANNEX 3: LCI<sup>10</sup> released by Joined Research Center (JRC) and other European Country regulations

- **Existing material emissions testing regulations in European Community:**
  - ANSES (Ex-Afsset) French Regulation<sup>11</sup>, AgBB / DIBT German Regulation<sup>12</sup>, Belgian VOC Emissions Regulation, Spanish Regulation... (see annex 2)
  - Construction Product regulation<sup>13</sup>
- **Following families of components are included in these LCI lists:**
  - Aromatic Hydrocarbon, Aliphatic and Cyclic hydrocarbon, Terpenes, Aliphatic and Aromatic alcohols, Glycol, glycol ethers, glycol esters, Aldehydes, Ketones, Acids, Esters and Lactones, Halogenated / Chlorinated Hydrocarbons, Others.....
- **LCI can be very different from one regulation to the others:**
  - Generally related to the timing of the LCI determination to update regulations.
  - LCI equivalence between different regulation still varies quite significantly but AgBB/DIBT recently aligned with many EU-LCI values
  - Future European regulations will hopefully harmonize LCI existing in the various country regulations.
- **VOC for Indoor air is related to the final formulation**
  - Contribution of Raw Material (=RM) to final VOC compounds depends on RM% in the final formulation and production process parameters.
  - In AgBB / DIBT and Afsset, the acceptable LCI of compounds can be linked to the sum of single identified components LCI when these single components have an identified LCI.
  - CEN 16516 seems to be a real improvement and is presented by some as replacing some other standards.

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<sup>10</sup> [http://www.eu-lci.org/EU-LCI\\_Website/Home.html](http://www.eu-lci.org/EU-LCI_Website/Home.html)

<sup>11</sup> <https://www.anses.fr/sites/default/files/documents/AIR2004et0011Ra-2.pdf>

<sup>12</sup> [http://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/agbb\\_evaluation\\_scheme\\_2015.pdf](http://www.umweltbundesamt.de/sites/default/files/medien/355/dokumente/agbb_evaluation_scheme_2015.pdf)

<sup>13</sup> [http://ec.europa.eu/growth/sectors/construction/product-regulation/index\\_en.htm](http://ec.europa.eu/growth/sectors/construction/product-regulation/index_en.htm)