

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1




Owner of the Declaration	Rudolf Hensel GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RHG-20190171-IAA1-EN
Issue date	26.02.2020
Valid to	25.02.2025

HENSOMASTIK® 5 KS
Rudolf Hensel GmbH

www.ibu-epd.com | <https://epd-online.com>



1. General Information

<p>Rudolf Hensel GmbH</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-RHG-20190171-IAA1-EN</p> <hr/> <p>This declaration is based on the product category rules: Coatings with organic binders, 07/2014 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 26.02.2020</p> <hr/> <p>Valid to 25.02.2025</p> <hr/> <p></p> <hr/> <p>Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p></p> <hr/> <p>Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p>HENSOMASTIK® 5 KS</p> <hr/> <p>Owner of the declaration Rudolf Hensel GmbH Lack- und Farbenfabrik Lauenburger Landstraße 11 21039 Börnsen</p> <hr/> <p>Declared product / declared unit The declared product is HENSOMASTIK® 5 KS. The declared unit involves 1 kilogram of the product. The packaging is included in the calculation. The declared unit is indicated in [kg].</p> <hr/> <p>Scope: This document refers to HENSOMASTIK® 5 KS. Specific data from the Rudolf Hensel GmbH manufacturing plant in Börnsen was used for generating this LCA. This LCA is based on data from 2018 which corresponds with the annual average.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of <i>EN 15804+A1</i>. In the following, the standard will be simplified as <i>EN 15804</i>.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2010</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p></p> <hr/> <p>Dr.-Ing. Wolfram Trinius (Independent verifier appointed by SVR)</p>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2010</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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2. Product

2.1 Product description/Product definition

HENSOMASTIK® 5 KS is an ablative, medium-viscosity and non-hygroscopic, water-based fire protection coating in the embodiments "paint", "viscous" and "putty". It is a factory-produced dispersion coating with organic binding agents, water, mineral fillers, pigments and additives. The coating is classified as low-emission, and contains no solvents, fibres, borates, plasticisers, halogens, formaldehydes or alkylphenol ethoxylates (APEO).

The fire protection coating is part of the "Green Product Line" of Rudolf Hensel GmbH.

HENSOMASTIK® 5 KS in the embodiments "paint", "viscous" and "putty":
 Directive (EU) No. 305/2011 (CPR) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The products and/or corresponding fire protection systems require a Declaration of Performance taking consideration of the /ETA 18/0417/ for HENSOTHERM® system for single

electrical cables or /ETA 15/0294/ for HENSOMASTIK® combined insulation EI60 or /ETA 15/0295/ for HENSOMASTIK® combined insulation EI90/EI120 and the corresponding CE marking.
 Use is governed by the respective national regulations.

Application of the products in Germany on the basis of the corresponding building codes is subject to the general technical approvals and/or general component type approvals
 /Z-19.53-2398/ for HENSOMASTIK® combined insulation system S90 and
 /Z-19.11-1246/ for HENSOMASTIK® 5 KS paint/viscous and
 /Z-19.11-1454/ for HENSOMASTIK® 5 KS putty and
 /Z-19.15-1224/ for HENSOMASTIK® ready-made bulkhead.

2.2 Application

The HENSOMASTIK® 5 KS ablation coating is a normally inflammable construction material in accordance with /DIN 4102-1/, classified for indoor and outdoor use.

The coating is suitable as fire protection for horizontally and vertically routed cables as well as for upgrading the cable supporting structure. In the event of approval in an individual case, use as a substitute for F30 suspended ceilings or as a substitute for I30 installation ducts is possible.

In conjunction with building material class A mineral fibre material, HENSOMASTIK® 5 KS is processed to make flexible wall constructions. Penetrations of all types of cables, combustible and non-combustible ducts and refrigerant lines can be sealed. When installed in rigid or light partition walls and in ceilings, this system corresponds to the fire resistance classes EI 60, EI 90 and EI 120 in accordance with /EN 1366-3/ and S90 in accordance with /DIN 4102-9/.

After HENSOMASTIK® 5 KS has dried completely and even with greater layer thicknesses, it is still highly elastic and resistant to ageing, water-impermeable following /DIN 1048/, oil and petrol-resistant, weatherproof and UV-resistant in accordance with /DIN 53384/.

2.3 Technical Data

HENSOMASTIK® 5 KS contains no hazardous substances exceeding the limit values of Annex XVII of /REACH/ and the /ECHA list of materials/ of particularly high concern.

Construction data

Name	Value	Unit
Density	1280 - 1420	kg/m ³
Solids content tested at 105°C for 3h	65 - 80	%
Lim. oxygen index (LOI)	37 - 48	%
Flexibility	≥ 6	mm mandrel diameter

HENSOMASTIK® 5 KS is an emission-rated coating material. Sampling, testing and evaluation were effected in accordance with the latest versions of /AgBB/, /ISO 16000-3/, /ISO 16000-6/, /ISO 16000-9/ and /ISO 16000-11/.

Germany: HENSOMASTIK® 5 KS meets the requirements of the /Approval guidelines for the health-related evaluation of indoor construction products/ (DIBt publications 10/2010) in conjunction with the LCI values of the AgBB in the version dated June 2012.

France: CMR substances: The tested product meets the requirements of the French directives /DEVP0908633A/ of 30 April 2009 and /DEVP0910046A/ of 28 May 2009.

VOC classification: HENSOMASTIK® 5 KS was classified as VOC emission class A+. The recommended classification is based on the French regulation for labelling building products or wall panelling, flooring, paints, and lacquers with respect to

their emissions of volatile contaminants, as published on 25 March 2011 /décret DEVL1101903D/ and 13 April 2011 /arrêté DEVL1104875A/.

HENSOMASTIK® 5 KS in the embodiments “paint”, “viscous” and “putty”:

The performance values of the product and the respective fire protection systems for Europe correspond with the Declaration of Performance in terms of their essential properties in accordance with /ETA 18/0417/ or /ETA 15/0294/ or /ETA 15/0295/.

The performance values for Germany in line with the general technical approvals and the general component type approvals in accordance with /Z-19.53-2398/ and /Z-19.11-1246/ and /Z-19.11-1454/ and /Z-19.15-1224/.

2.4 Delivery status

HENSOMASTIK® 5 KS is a medium-viscosity coating material and is offered in plastic containers of different sizes from 6 to 25 kg.

2.5 Base materials/Ancillary materials

Name	Value	Unit
Polymer dispersion 50%	45 - 60	% [m/m]
Aluminium hydroxide	20 - 40	% [m/m]
Pigment TiO ₂	< 5	% [m/m]
Silicate fibres	< 5	% [m/m]
Dispersing agents	< 1	% [m/m]
Thixotropic agents	< 1	% [m/m]
In-can preservatives	< 1	% [m/m]
Water	< 5	% [m/m]

The in-can preservative contained in the product comes from the group of isothiazolinones.

2.6 Manufacture

The manufacture of HENSOMASTIK® 5 KS is effected in a fully automatically controlled dispersion unit. The dosage of the liquid raw materials is effected largely automatically; powders are dosed manually. The preliminary products required for manufacture are made available after an inspection of the incoming materials.

After the batches have been produced, an internal quality control is carried out. This comprises technical quality characteristics relating to paint and fire protection requirements.

Besides the internal factory production control, official external monitoring takes place at regular intervals.

2.7 Environment and health during manufacturing

The preliminary products are stored in such a way that, as far as humanly possible, they cannot enter the environment.

With raw materials that are dosed automatically, direct contact between the workers and the preliminary products is avoided. When raw materials in powder form are dosed manually, direct contact with the raw material is reduced to a minimum. As well as adequately dimensioned extraction units, the workers have protective clothing and dust masks at their

disposal. Suitable body protection equipment is also provided.

The production process is optimised in such a way that the parts of the unit can be cleaned in situ. Any cleaning water is fed back into the production process as production water. If this is not possible on account of a product change, the cleaning water is collected and thermally recycled.

All types of waste are sorted, stored and returned to the recycling process.

HENSOMASTIK® 5 KS contains no substances that have to be declared in accordance with /REACH/ (Annex XVII) and in accordance with the /ECHA list of materials/.

2.8 Product processing/Installation

The product can be applied using brushes, rollers or sprays.

Details concerning surface pre-treatment, application requirements and drying behaviour can be seen in the current technical information sheet (see www.rudolf-hensel.de).

2.9 Packaging

The coatings are filled in plastic containers made of polypropylene (PP), which are recycled by the customers returning the packaging. The plastic containers are packed on pallets for shipping and are protected with a shrink foil made of low-density polyethylene (LDPE).

2.10 Condition of use

This is an ablative fire protection coating on an aqueous polymer dispersion basis for protecting electric cables and cable routes. After the coating has been applied, the film is formed by physical drying / evaporation of the receptively contained water. The dried polymer film, including the non-aqueous substances, remains on the coated component.

2.11 Environment and health during use

HENSOMASTIK® 5 KS is a coating with extremely low emissions and is regarded as being harmless to health. Emission tests – performed in independent laboratories – have confirmed the requirements of various national and international emissions standards, with classification in the lowest emission class (see Section 7).

The coating contains no solvents, fibres, borates, plasticisers, halogens, formaldehydes or alkylphenol ethoxylates (APEO).

2.12 Reference service life

For HENSOMASTIK® 5 KS, when used for the intended purpose, the service life is at least 10 years – /Test Certificate MPA Braunschweig/.

HENSOMASTIK® 5 KS has been used as a fire protection coating for electric cables, cable trays or ladders and flexible wall constructions since 1986, so that the practical service life is normally far longer than 10 years.

A precondition for a long service life is that the requirements of correct handling and regular inspection of the coated substrates are satisfied.

The information concerning service life cannot be interpreted as a guarantee given by the manufacturer, but serves as an aid towards the selection of the right product, taking account of the expected and economically reasonable service life of the building.

When the products are used according to the standard codes of practice, adverse influences through ageing are not known.

2.13 Extraordinary effects

Fire

Ablative fire protection coatings contain components (incl. fire retardants) which decompose when they absorb energy. On account of this decomposition, these coatings consume energy, thus protecting the substrate from fire as well as the environment of the fire, thanks to this cooling mechanism. When the decomposition temperature of the active components is reached, the fire protection effect begins spontaneously and continues until decomposition is fully completed.

Fire protection

Name	Value
Building material class according to EN13051-1	E

Water

No substances hazardous to water are washed out.

Mechanical destruction

No consequences for the environment caused by unforeseen mechanical destruction are known.

2.14 Re-use phase

On account of its share of organic products, HENSOMASTIK® 5 KS has a substance-inherent energy content which can be recovered in incineration plants. On account of the thermoplastic properties of the fire protection coating, the latter can be softened with a hairdryer and then mechanically removed with a scraper.

If the fire protection coating is to be deposited separately, it meets the required standards for disposal.

2.15 Disposal

The following waste codes must be taken into consideration:

a) Solid product residue:
/AVV/ No. (recommended): 080118 Waste from paint and varnish removal with the exception of that covered by 080117.

b) Liquid product residue:
/AVV/ No. (recommended): 080120 Aqueous suspensions containing paint and varnish with the exception of that covered by 080119

Packaging that cannot be cleaned is to be disposed of like the substance. Uncontaminated packaging can be recycled.

/AVV/ No. (recommended): 1501025 Packaging made of plastic

2.16 Further information

Further product information is available at:

www.rudolf-hensel.de

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit is a fire resistant by Rudolf Hensel GmbH with the designation HENSOMASTIK® 5 KS, with packaging. The calculated weight is one kilogram of the fire retardant. The packaging is also included in the calculation. The following table depicts the data on the declared unit.

Declared unit

Name	Value	Unit
Declared unit	1	kg
Conversion factor to 1 kg	1	-

3.2 System boundary

Type of EPD: cradle to plant gate. The following information modules are defined in this study as system boundaries:

A1-A3, Product stage:

A1, Raw material supply

A2, Transport to manufacturer

A3, Production

A total of three information modules are reviewed in order to obtain an accurate record of the indicators and environmental impact of the declared unit. Information modules A1 to A3 outline the provision of raw materials, transport to the production facility and the actual product production processes.

All preliminary products are procured mainly in Germany. Transport is exclusively by truck. The following process diagram depicts the production process on which this is based.

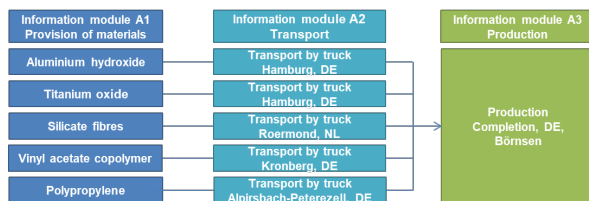


Fig.: Flow chart of the production process

3.3 Estimates and assumptions

Country-specific power mixes and additional background information are calculated for the production processes. In order to calculate the material provision of the titanium oxide, a titanium oxide data set is used, since there is no data set for titanium oxide in the data bases used. This is also applicable for the

formula contents vinyl acetate copolymer (50% aqueous) which is shown by the ethylene vinyl acetate copolymer data set. Since the transportation routes are mainly within Germany, a German mixture was used as a basis for the provision of fuel.

3.4 Cut-off criteria

The following formula contents come under the cut-off criterion because they are far below 5% weight of the product mass: Dispersing agents (<1%), thixotropic agents (<1%) and pot preservative (<0.25%) are not included in the calculation.

Material consumption for the Euro-pallets used for transport is less than 5% by mass on account of the fact that they are reused and therefore fall short of the cut-off criterion in the overall calculation

3.5 Background data

The data basis of the background data of the /GaBi 8.7/ databases to which this study also refers is provided in the URL indicated in the literature.

3.6 Data quality

Specific data for 2018 from the Rudolf Hensel GmbH manufacturing plant in Börnsen, Germany was used for generating this Life Cycle Assessment. The background data used from the /GaBi 8.7/ data base refers to 2018 and is therefore very recent.

The mass of individual product components comes from the information on the formula. According to the manufacturer, it can be assumed that the accuracy of this information is high.

3.7 Period under review

This LCA is based on data from 2018 which corresponds with the annual average.

3.8 Allocation

Co-products are allocated in the information modules A1-A3. The production waste incurred by injection-moulded parts and production completion in Börnsen is thermally recovered. The ensuing electric and thermal energy credits are completely charged in Module A3.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The data basis of the background data of the /GaBi 8.7/ databases to which this study also refers is provided in the URL indicated in the literature.

4. LCA: Scenarios and additional technical information

No additional scenarios were declared for this EPD.

5. LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: HENSOMASTIK® 5 KS [1 kg]

Parameter	Unit	A1-A3
Global warming potential	[kg CO ₂ -Eq.]	1.25
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	8.53E-8
Acidification potential of land and water	[kg SO ₂ -Eq.]	1.07E-2
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	2.21E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	6.44E-4
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	6.28E-6
Abiotic depletion potential for fossil resources	[MJ]	30.30

RESULTS OF THE LCA - RESOURCE USE according to EN 15804+A1: HENSOMASTIK® 5 KS [1 kg]

Parameter	Unit	A1-A3
Renewable primary energy as energy carrier	[MJ]	1.42
Renewable primary energy resources as material utilization	[MJ]	0.00
Total use of renewable primary energy resources	[MJ]	1.42
Non-renewable primary energy as energy carrier	[MJ]	23.10
Non-renewable primary energy as material utilization	[MJ]	9.12
Total use of non-renewable primary energy resources	[MJ]	32.20
Use of secondary material	[kg]	0.00
Use of renewable secondary fuels	[MJ]	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0
Use of net fresh water	[m ³]	22.70

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: HENSOMASTIK® 5 KS [1 kg]

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	0.00
Non-hazardous waste disposed	[kg]	0.01
Radioactive waste disposed	[kg]	1.04E-4
Components for re-use	[kg]	0.00
Materials for recycling	[kg]	0.00
Materials for energy recovery	[kg]	0.00
Exported electrical energy	[MJ]	0.00
Exported thermal energy	[MJ]	0.00

All indicators are collected in accordance with /EN 15804/. The estimated impact of environmental impacts is in accordance with /CML 2001 April 2015/.

6. LCA: Interpretation

The dominance analysis indicates that the main causes of environmental impacts and indicators can be found in information module A1. This shows a GWP for material provision of approx. 89% with reference to all information modules.

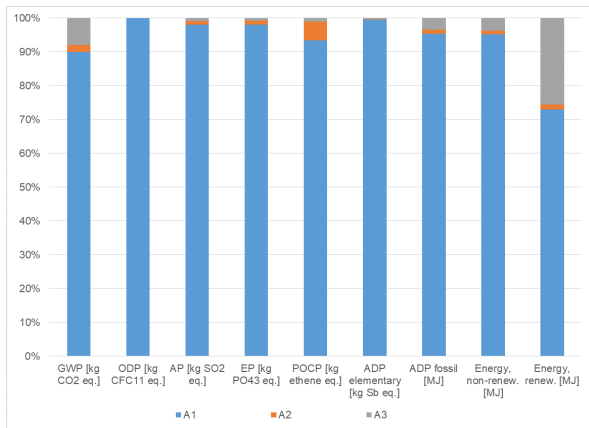


Fig.: Dominance analysis Modules A1 to A3

If we look at the material provision for the fire retardant HENSOMASTIK® 5 KS in detail, it becomes clear that three raw materials make a decisive contribution to the environmental impacts and indicators in question. The material provision of the vinyl acetate copolymer accounts for approx. 58% of greenhouse gas emissions. With titanium oxide this figure is about 22% and with aluminium hydroxide it is about 15% of the greenhouse gas emissions.

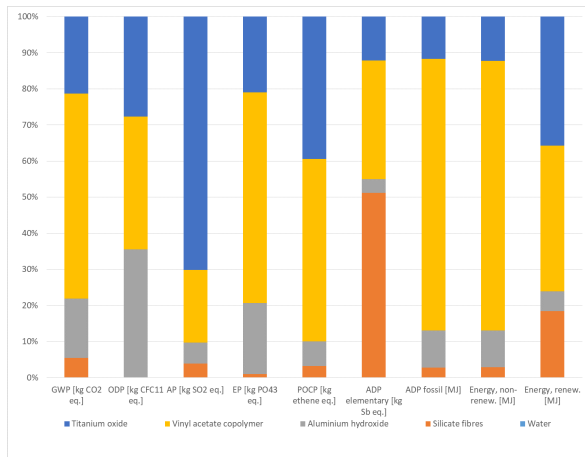


Fig.: Dominance analysis Module A1

The mass of individual product components comes from the information on the formula. According to the manufacturer, it can be assumed that the accuracy of this information is high.

The relevant data sets that were used to calculate the material provision of the product are absolutely up to date (EU: ethyl vinyl acetate copolymer, /ecoinvent 3.5/, year: 2018; RER: titanium dioxide, /ecoinvent 3.5/, year: 2018; EU-27: aluminium hydroxide, /ecoinvent 3.5/, year: 2018).

As these data sets have a strong influence on the results – as indicated by the dominance analysis – the same also applies for the overall calculation.

7. Requisite evidence

7.1 VOC emissions

Name	Value	Unit
AgBB overview of results (28 days)	<5	ug/m ³
TVOC (C6 - C16)	<5	µg/m ³
Sum SVOC (C16 - C22)	<5	µg/m ³
R (dimensionless)	<1	-
VOC without NIK	<5	µg/m ³
Carcinogenic Substances	<1	µg/m ³

AgBB result table (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	-	µg/m ³
SumSVOC (C16-C22)	-	µg/m ³
R (dimensionless)	-	µg/m ³
VOC without NIK	-	µg/m ³
Carcinogenic Substances	-	µg/m ³

Test reports:

HENSOMASTIK® 5 KS: /Eurofins Product Testing A/S/

The emission values were determined immediately after application of the coating materials.

HENSOMASTIK® 5 KS meets the requirements relating to a low VOC content in accordance with /LEED/.

HENSOMASTIK® 5 KS is registered with the Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB - German Association for Sustainable Building). Registration code: CDDWRA

8. References

/IBU 2016/

IBU (2016): General EPD programme instructions of Institut Bauen und Umwelt e.V. (IBU), version 1.1, Institut Bauen und Umwelt e.V., Berlin

/ISO 14025/

DIN EN /ISO 14025:2011-10/, Environmental labels and declarations – Type III environmental declarations – Principles and processes

/EN 15804/

/EN 15804:2012-04+A1 2013/, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

/PCR: Coatings with organic binding agents/

Product category guidelines for building-related products and services, Part B: Requirements on the Environmental Product Declaration for coatings with organic binding agents, version 1.0; Berlin: Institut Bauen und Umwelt e.V. (pub.), July 2014

/ISO 14044/

DIN EN ISO 14044:2006-10: Environmental management – Life cycle assessment – Requirements and guidelines

/GaBi 8.7/

GaBi 8.7: Software and data base for comprehensive analysis; service pack 37, Stuttgart, Echterdingen: thinkstep AG

/CML 2001, Apr. 2015/

Impact categories of the University of Leiden, <https://www.universiteitleiden.nl/> (20.10.2019)

/ecoinvent v. 3.5/

Software and database for life cycle assessment; version 3.5, Zurich: ecoinvent <http://www.ecoinvent.org> (20.10.2019)

/REACH/

REACH Directive (EC/1907/2006) Annex XVII – Restrictions Official Gazette No. L 396/396-851 dated 30.12.2006

/ECHA candidate list/

Candidate List of Substances of Very High Concern for Authorization, European Chemicals Agency (ECHA) (published in accordance with Article 59(10) of the REACH Regulation)

/DIN 4102-1/

DIN 4102-1:1998-05, Fire behaviour of building materials and building components; Building materials, concepts, requirements and tests

/DIN 1048-1/

DIN 1048-1:1991-06, Test methods for concrete; Fresh concrete

/EN 13501-1/

DIN EN 13501-1:2019-05, Classification of construction products and methods by reaction to fire – Part 1: Classification with the results of tests on reaction to fire of construction products

/ISO 11890-2/

ISO 11890-2:2013, Paints and varnishes – Determination of volatile organic compound (VOC) content – Part 2: Gas-chromatographic method

/ISO 16000-3/

ISO 16000-3:2011, Indoor air – Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air – Active sampling method

/ISO 16000-6/

ISO 16000-6:2011, Indoor air – Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID

/ISO 16000-9/

ISO 16000-9: 2006, Indoor air – Part 9: Determination of the emission of volatile organic compounds from building products and furnishing – Emission test chamber method

/ISO 16000-11/

ISO 16000-11:2006, Indoor air – Part 11: Determination of the emission of volatile organic compounds from building products and furnishing – Sampling, storage of samples and preparation of test specimens

/AgBB/

Ausschuss zur gesundheitlichen Bewertung von Bauprodukten (Committee for Health-related Evaluation of Building Products, AgBB): Evaluation scheme developed for VOC emissions from building products suitable for indoor use (2012)

/Approval guidelines for the health-related evaluation of indoor construction products/

(DIBt publications 10/2010) in conjunction with the LCI values of the AgBB in the version dated June 2012

/DEVP0908633A/

French Directive DEVP0908633A dated 30 April 2009

/DEVP0910046A/

French Directive DEVP0910046A dated 28 May 2009

/décret DEVL1101903D/

French Decree DEVL1101903D dated 25 March 2011

/arrêté DEVL1104875A/

French Decree DEVL1101875A dated 13 April 2011

/Royal Decree for determining the limit values for indoor emissions by construction products for certain intended types of use/

Draft of December 2012: KINGDOM OF BELGIUM – Federal Public Service Health, Safety of the FOOD CHAIN AND ENVIRONMENT

/DIN 4102-9/

DIN 4102-9:1990-05, Fire behaviour of building materials and building components; Seals for cable penetrations; Concepts, requirements and testing

/EN 1366-3/

DIN EN 1366-3:2009-07, Fire resistance tests for service installations – Part 3: Penetration seals

/Test certificate, MPA Braunschweig/

Document number (3623/1599) – 7/09 – Mü)

/IEC publication 332-3: 1982**/LEED/**

Leadership in Energy and Environmental Design (LEED): LEED credit EQ c4.2 – Low Emitting Materials – Paint and Coatings (2009)

/DIN 53384/

DIN 53384:1989-04, Testing of plastics – Artificial weathering and ageing of plastics by exposure to laboratory UV radiation sources

AVV

Ordinance governing the European Waste Catalogue (List of wastes – AVV); issue date: 10.12.2001

/Eurofins Product Testing A/S/

HENSOMASTIK® 5 KS: Report No.: 392-2013-00015802 dated 26.07.2013

/ETA 18/0417/

European Technical Assessment dated 26.07.2018 for HENSOTHERM® system for single cables

/ETA 15/0294/

European Technical Assessment dated 28.03.2019 for HENSOMASTIK® combined insulation EI60

/ETA 15/0295/

European Technical Assessment dated 21.11.2018 for HENSOMASTIK® combined insulation EI90/EI120

/Z-19.53-2398/

General technical approval dated 01.09.2019 for HENSOMASTIK® combined insulation system S90

/Z-19.11-1246/

General technical approval dated 01.01.2015 for HENSOMASTIK® 5KS paint and 5KS viscous

/Z-19.11-1454/

General technical approval dated 02.01.2018 for HENSOMASTIK® 5KS putty

/Z-19.15-1224/

General technical approval dated 01.09.2019 for HENSOMASTIK® ready-made bulkhead

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