

## European Technical Assessment

**ETA 21/0475**  
of 22/09/2022

### General Part

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| <b>Technical Assessment Body Issuing the European Technical Assessment:</b>  | <b>Element Materials Technology Rotterdam B.V.</b>   |
| <b>Trade Name of the Construction Product:</b>   | <b>HENSOTHERM® 920 KS</b>  |
| <b>Product Family to Which the Construction Product Belongs:</b>   | 35. Fire Protective Products<br>Reactive Coating for the Fire Protection of Steel Elements           |
| <b>Manufacturer:</b>   | <b>Rudolf Hensel GmbH</b><br>Lauenburger Landstrasse 11<br>D-21039 Börnsen<br>Germany                |
| <b>Manufacturing Plant(s):</b>   | <b>Rudolf Hensel GmbH</b><br>Lauenburger Landstrasse 11<br>D-21039 Börnsen<br>Germany                |
| <b>This European Technical Assessment Contains:</b>  | 37 pages including 2 Annexes which form an integral part of this assessment.                         |
| <b>This European Technical Assessment is Issued in Accordance with Regulation (EU) No 305/2011, On the Basis Of:</b> | EAD 350402-00-1106 Fire Protective Products: Reactive Coatings For Fire Protection of Steel Elements |
| <b>This Version Replaces:</b>  | ETA 21/1088 (v1), dated 05/08/2021   |

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## 1. Technical Description of the Product

HENSOTHERM® 920 KS is a spray or brush/roller applied intumescent paint formulated for the fire protection of structural steel elements.

In accordance with EAD 350402-00-1106: September 2017, HENSOTHERM® 920 KS may be considered as a reactive coating kit that includes one or more primers and/or topcoats (Option 3).

## 2. Specification of the Intended Use(s) in Accordance with the Applicable European Assessment Document (hereinafter EAD)

The intended use of HENSOTHERM® 920 KS is to fire protect various sizes of structural steel I/H beams and columns as well as rectangular/square and circular hollow columns for up to a fire resistance classification of R150 for design temperatures in the range of 350°C to 750°C.

A pass performance against the slow heating curve is claimed for the product.

The provisions made in this ETA are based on an assumed working life of the applied coating for the intended use of at least 10 years for environmental categories Types Z<sub>2</sub>, Z<sub>1</sub>, X and Y, provided that it is subject to appropriate use and maintenance according to manufacturer's instruction.

EAD 350402-00-1106: September 2017 also allows to assume 25 years working life where the ETA applicant can offer sufficient additional documented proof for the technical examination. Rudolf Hensel GmbH have supplied additional information for Type Z<sub>2</sub> where the data supplied demonstrates the use of HENSOTHERM® 920 KS for a working life of 25 years in environmental condition Type Z<sub>2</sub>. Therefore, 25 years working life is assumed for environmental category Type Z<sub>2</sub>.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer, but are to be used as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

HENSOTHERM® 920 KS has been assessed as being compatible with the following primers:

| Primer Reference                        | Primer Type                        | Tested Nominal Primer DFT (µm) | Permitted Primer Thickness Range (µm) <sup>1</sup> |         |
|---|------------------------------------|--------------------------------|--|---------|
|   |                                    |                                | Minimum  | Maximum |
| No primer                               | -                                  | -                              | -  | -       |
| HENSOGRUND 2K EP <sup>2</sup>           | 2 component epoxy                  | 86 and 161                     | 43.0   | 241.5   |
| HENSOGRUND 2K <sup>3</sup> (galvanised) | 2 component epoxy                  | 75                             | 37.5   | 112.5   |
| Pulver ITC Fire Guard <sup>4</sup>      | Single component epoxy - polyester | 93                             | 46.5   | 139.5   |

DFT: Dry Film Thickness

<sup>1</sup> The permitted theoretical minimum and maximum DFTs cannot be less or exceed the DFT recommended by the manufacturer. The practical information given by the manufacturer must be followed.

<sup>2</sup> The generic approval is applicable to other primers from the same generic group provided the thickness is within the tolerance given. The approval does not cover galvanised steel.

<sup>3</sup> The approval is applicable to the specific primer only (trade name and type) for application on galvanised steel. No generic approach is possible.

<sup>4</sup> The approval is applicable to the specific primer only (trade name and type). No generic approach is possible. The approval does not cover galvanised steel.

HENSOTHERM® 920 KS has been assessed as having passed the requirements for durability according to EAD 350402-00-1106: September 2017 with and without the topcoats:

| Topcoat Reference <sup>1</sup> | Topcoat Description  | Tested Nominal Topcoat DFT (mm) | Permitted Topcoat Thickness Range (mm) |                      | Approved Topcoat Colours | Durability Approvals Based On The Carried Out Testing |                     |        |        |
|--------------------------------|--|---------------------------------|--|----------------------|--------------------------|---|---------------------|--------|--------|
|                                |  |                                 | Minimum                                | Maximum <sup>2</sup> |                          | Type Z <sub>2</sub>                                   | Type Z <sub>1</sub> | Type Y | Type X |
| No Topcoat                     | -  | -                               | -                                      | -                    | -                        | ✓   | ✓                   | ✓      | ✓      |
| HENSOTOP SB                    | Solvent-based single component, halogen-free and fast-drying | 90                              | Manufacturer recommended <sup>3</sup>  | 135                  | All                      | ✓   | ✓                   | ✓      |        |
| HENSOTOP 2K PU                 | 2 component polyester  | 65 and 90                       | Manufacturer recommended <sup>3</sup>  | 135                  | All                      | ✓   | ✓                   | ✓      | ✓      |
| Teknodur 0050                  | 2 component polyurethane                                     | 61                              | Manufacturer recommended <sup>3</sup>  | 92                   | All                      | ✓   | ✓                   | ✓      | ✓      |

DFT: Dry Film Thickness

<sup>1</sup> The approval is limited to the specific product (trade name and type) and no generic approach is possible.

<sup>2</sup> The permitted theoretical maximum DFT cannot exceed the DFT for each product as recommended by the manufacturer. The practical information given by the manufacturer must be followed.

<sup>3</sup> Tests on the product were performed using specimens with and without topcoat to demonstrate that addition of the topcoat has no influence on the insulation efficiency. The product is found to be equally suitable with and without topcoat for environmental condition Types Z<sub>2</sub>, Z<sub>1</sub>, Y and X where applicable. Therefore, topcoat thickness can be reduced to the minimum recommended by the manufacturer.

HENSOTHERM® 920 KS was subjected to the identification testing in accordance with the methods of identification defined in Table 4 of EAD 350402-00-1106. Tests for ‘fingerprinting’ as described in Annex E (Thermoanalytical analyses (TG) and Infrared spectroscopy analyses (IR)) have been done and reported in the Element test report Nos. ERO035029-1 Rev.1 (FTIR) and C5459-1 (TG).

The reactive coating HENSOTHERM® 920 KS has a performance determined for a reaction to fire classification in accordance with EN 13501-1: 2018 of Class E.

This classification is valid for the fire protection of steel elements, applied with or without the specified primer and with or without the specified topcoats to a steel substrate of minimum thickness 2mm.

The above classification is also valid for the following product parameters:

|                      |  |
|----------------------|--|
| Permitted topcoats   | “HENSOTOP SB”- a 1-pack acrylic coating <b>OR</b><br>“HENSOTOP 2K PU” – a 2-pack polyurethane coating<br><b>OR</b><br>None applied |
| Permitted primer     | “HENSOGRUND 2K EP” – a 2-pack epoxy coating <b>OR</b><br>None applied  |
| Topcoat colour       | Any colour allowed   |
| Coating thickness    | ≤ thickness as tested allowed  |
| Product composition  | No variation allowed   |
| Product construction | No variation allowed other than as detailed above  |

### 3. Performance of the Product and References to the Methods Used for its Assessment

| Product: Reactive coating   |  | Intended use: Fire protection of structural steel elements  |
|---|--|---|
| Assessment method   | Essential characteristic                                       | Product performance   |
| <b>BASIC WORKS REQUIREMENT 2: SAFETY IN CASE OF FIRE</b>                  |  |   |
| EN 13501-1: 2018  | Reaction to fire   | Class E   |
| EN 13501-2: 2016  | Fire resistance  | (R15 – R150) – IncSlow<br>(I/H Beams and Columns)<br>and<br>(Hollow Columns)<br>(see Annex A)   |
| <b>BASIC WORKS REQUIREMENT 3: HYGIENE, HEALTH AND THE ENVIRONMENT</b>     |  |   |
| Indoor air quality to<br>DIN EN 16516: 2018-01 and<br>AgBB 2018 / DIBt    | Content, emission and or<br>release of dangerous<br>substances | Use categories: IA1 and IA2<br>(see Annex B)  |
| <b>BASIC WORKS REQUIREMENT 4: SAFETY AND ACCESSIBILITY IN USE</b>         |  |   |
| EAD 350402-00-1106:<br>September 2017<br>Clause 2.2.4 and Clause<br>2.2.5 | Adhesion and Durability  | <ul style="list-style-type: none"> <li>• Primer and top coat compatibility</li> <li>• Type X durability</li> <li>• Type Y durability</li> <li>• Type Z<sub>1</sub> durability</li> <li>• Type Z<sub>2</sub> durability</li> </ul> |
| EAD 350402-00-1106:<br>September 2017<br>Table 4                          | Identification   | Thermoanalytical analyses<br>(TG) and Infrared<br>spectroscopy analyses<br>(FTIR)   |

**4. Assessment and Verification of Constancy of Performance (hereinafter AVCP) System Applied, with reference to its Legal Base**

According to the decision 1999/454/EC of the European Commission Decision of date 22 June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, the system of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) given in the following table apply:

| <b>Products</b>                               | <b>Intended uses</b>              | <b>Level or Class</b> | <b>System</b> |
|---|-----------------------------------|-----------------------|---------------|
| Fire protective products (including coatings) | Fire protection of steel elements | Any                   | 1             |

**5. Technical Details Necessary for the Implementation of the AVCP System, as Provided for in the Applicable EAD**

The manufacturer shall exercise permanent internal control, record and evaluate the results of factory production in accordance with the provisions laid down in the "Control Plan" related to this European Technical Assessment. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. The production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use verified by Technical Assessment Body initial/raw/constituent materials stated in the technical documentations related to this European Technical Assessment.

The approved body shall retain the essential points of its actions referred to above and state the results obtained and conclusions drawn in a written report.

In cases where the provisions of the European technical assessment and its "Control Plan" are no longer fulfilled the certification body shall withdraw the Certificate of Constancy and inform the relevant authorities e.g. NANDO, EOTA.

The Table 5 in EAD 350402-00-1106 presents an example of the properties that shall be controlled and minimum frequencies of control. The exact test method and threshold have been laid down in the factory production control plan, operated by the manufacturer and deposited at Element Materials Technology Rotterdam B.V.

Issued in Amsterdam, Netherlands on 22/09/2022

By

A handwritten signature in black ink, appearing to read 'Niresh Somlie', with a horizontal line underneath.

Niresh Somlie

Technical Assessment Body Manager



## Annex A - Product Performance: Fire Resistance

- 1 This Annex relates to the use of HENSOTHERM® 920 KS for the fire protection of I/H beams and columns as well as rectangular/square and circular hollow columns. The precise scope is given in Tables of Results which present the total dry film thickness of HENSOTHERM® 920 KS (excluding primer and topcoat) required to provide resistance to fire classifications of (R15 – R150) – IncSlow in accordance with EN 13501-2: 2016 for sections at various design temperatures and section factors.
- 2 The product is approved on the basis of:
  - i) Testing in accordance with the principles of BS EN 13381-8: 2013.
  - ii) A design assessment adopting the graphical analysis defined in Annex E of BS EN 13381-8: 2013.
- 3 The data presented in the tables in this Annex refers to both beams (three-sided fire exposure) and columns (four side/surface area exposure).
- 4 The data shown is applicable to steel sections blast cleaned to ISO 8501-1 Sa2.5 or equivalent and primed with the compatible primers and topcoats listed in this ETA. The primer and topcoat permitted dry film thicknesses are provided in the body of this ETA. The data is also applicable to galvanized steel sections with the compatible primer(s).
- 5 The product demonstrated fitness for purpose when applied directly to blast cleaned substrates therefore the data shown is applicable to steel sections blast cleaned to ISO 8501-1 Sa2.5 or equivalent followed by a direct application of HENSOTHERM® 920 KS.
- 6 The data for the 'I' and 'H' shaped beams and columns applies also to other shaped steel sections that have re-entrant details such as channels, angles and tees.
- 7 HENSOTHERM® 920 KS has been exposed to the slowing heating regime (IncSlow) defined in Annex A of EN 13381-8: 2013 and has satisfied the requirements to provide classification according to EN 13501-2: 2016.
- 8 Following the EN 13381-8:2013 clause 15, for section factors below the extended minimum given in Tables of Results, the same coating thickness as that applied to the extended minimum section factor shall be applied.

## Annex B - Indoor air quality

The performance of the product related to the emissions was evaluated against the AgBB scheme 2018.

Total volatile organic compounds (TVOC) and total semi volatile organic compounds (TSVOC) determined to DIN EN 16516: 2018-01 and AgBB 2018 / DIBt after 3 and 28 days preconditioning are the following:

### Indoor Air Quality Results To Different Guidelines

|               | 3 days<br>( $\mu\text{g}/\text{m}^3$ )                       | 28 days<br>( $\mu\text{g}/\text{m}^3$ )                |
|---------------|--|--|
| <b>TVOC*</b>  | $\leq 300$ to DIN EN 16516<br>$\leq 300$ to AgBB 2018 / DIBt | $< 200$ to DIN EN 16516<br>$< 200$ to AgBB 2018 / DIBt |
| <b>TSVOC*</b> | $< 5$ to DIN EN 16516<br>$< 5$ to AgBB 2018 / DIBt           | $< 5$ to DIN EN 16516<br>$< 5$ to AgBB 2018 / DIBt     |

| Risk value for assessment of LCI after 28 days | R-value* |
|--|----------|
| R-value according to AgBB 2018 / DIBt          | $< 1.0$  |

\*The exact results are deposited at Element Materials Technology Rotterdam B.V.

The results of the emission testing to the Scheme 'Health-related Evaluation of Emissions of Volatile Organic Compounds (VOC, VOC and SVOC) from Building Products' of the Committee for Health-Related Evaluation of Building Products (AgBB 2018) are as follows:

| Test parameter  | Result*                        | AgBB scheme 2018 requirement   |
|---|--------------------------------|--------------------------------|
| <b>Measurement time: 3 days after test chamber loading</b>  |                                |                                |
| Sum VOC (C6-C16) including SVOC with LCI <sup>1</sup>       | $\leq 10\text{mg}/\text{m}^3$  | $\leq 10\text{mg}/\text{m}^3$  |
| <b>Measurement time: 28 days after test chamber loading</b> |                                |                                |
| Sum VOC (C6-C16) including SVOC with LCI <sup>1</sup>       | $\leq 1\text{mg}/\text{m}^3$   | $\leq 1\text{mg}/\text{m}^3$   |
| Sum SVOC with LCI (C16-C22) <sup>1</sup>                    | $\leq 0.1\text{mg}/\text{m}^3$ | $\leq 0.1\text{mg}/\text{m}^3$ |

<sup>1</sup> For SUM VOC (C6-C16) and Sum SVOC (C16-C22) only substances  $\geq 5\mu\text{g}/\text{m}^3$  are considered

\*The exact results are deposited at Element Materials Technology Rotterdam B.V.