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European Technical Assessment

ETA – 20/1229
of 02/02/2021

General Part

Technical Assessment Body Issuing the European Technical Assessment:	Element Materials Technology Rotterdam B.V.
Trade Name of the Construction Product:	HENSOTHERM® 410 KS
Product Family to Which the Construction Product Belongs:	35. Fire Protective Products Reactive Coating for the Fire Protection of Steel Elements
Manufacturer:	Rudolf Hensel GmbH Lauenburger Landstr 11, D-21039 Börnsen, Germany
Manufacturing Plant(s):	Rudolf Hensel GmbH Lauenburger Landstr 11, D-21039 Börnsen, Germany
This European Technical Assessment Contains:	28 pages including 1 Annex which form an integral part of this assessment.
This European Technical Assessment is Issued in Accordance with Regulation (EU) No 305/2011, On the Basis Of:	EAD 350402-00-1106 Fire Protective Products: Reactive Coatings For Fire Protection of Steel Elements.
This Version is a Corrigendum To:	ETA 20/1229, issued on 16/12/2020 Note: ETA 20/1229 of 16/12/2020 replaced ETA 11/0481 of 2020/11/20

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1. Technical Description of the Product

HENSOTHERM®410 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, HENSOTHERM® 410 KS may be considered as a reactive coating kit that includes one or more primers and/or topcoats (Option 3).

According to the manufacturer's declaration, the product specification has been compared with Annex XVII of REACH and the ECHA Candidate List of Substances of Very High Concern to verify that that it does not contain such substances.

In addition to the specific clauses relating to dangerous substances contained in this European technical assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

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

The intended use of HENSOTHERM® 410 KS is to fire protect various sizes of structural steel 'H' or 'I' beams and columns and rectangular/square hollow columns and circular hollow columns for up to a fire resistance classification of R90, and for design temperatures in the range of 350°C to 750°C.

The resistance to fire performance according to EN 13501-2 has been determined in accordance with test principles defined in EN 13381-8: 2013 including Annex A (slow heating curve). The test data was analysed according to EN 13381-8: 2013. Annex A summarises the results of the analysis.

The fire protection coating in conjunction with the HENSOGROUND 1966E, HENSOGROUND 2K and HENSOGROUND AQ primers and HENSOTOP 84 and HENSOTOP 84 AQ topcoats has a performance determined for a reaction to fire classification in accordance with EN 13501-1 of Class E.

The provisions made in this ETA are based on an assumed working life of the applied coating for the intended use of 10 years, for environmental categories Types Z₁, X and Y. EAD 350402-00-1106 also allows to assume 25 years working life where the ETA applicant can offer sufficient additional documented proof for technical examination.

Rudolf Hensel GmbH have supplied additional information for Type Z₂ to both Warringtonfire and BAM, who have both independently verified that the data supplied demonstrates the use of HENSOTHERM® 410 KS for a working life of 25 years in environmental condition Type Z₂.

Therefore, 25 years working life is assumed for environmental category Type Z₂.

The above provisions are made provided that it is subject to appropriate use and maintenance according to the manufacturer's instruction. 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® 410 KS has been assessed as being compatible, in accordance with the test procedures defined in EAD 350402-00-1106 with the following primers:

Primers				
Primer Reference	Generic Primer Type	Tested Nominal Primer DFT (mm)	Permitted Primer Thickness Range (mm)	
			Minimum*	Maximum
HENSOGRUND 1966E	Alkyd resin, solvent based	0.06	0.03	0.09
HENSOGRUND 2K	Two component epoxy resin, solvent based	0.07	0.035	0.105
HENSOGRUND 2K	Two component epoxy resin, solvent based (on Galvanised steel)	0.15	0.075	0.30
HENSOGRUND AQ	Water-based acrylic	0.07	0.035	0.105
HENSOGRUND AQ	Water-based acrylic (on Galvanised steel)	0.14	0.07	0.21
HENSOGRUND WB Green	Water-based acrylic	0.064	0.032	0.266
HENSOGRUND WB Green	Water-based acrylic	0.177	0.032	0.266
HENSOGRUND WB Green/HENSOTOP WB Green	Water-based acrylic/ Water-based acrylic	0.092/0.092	0.046/0.046	0.138/0.138
HENSOGRUND WB Green	Water-based acrylic (on galvanized steel)	0.050	0.025	0.075

* Where the permitted theoretical minimum DFT is less than typical minimum dry film thickness recommended by manufacturer, the practical information given in product data sheet must be followed.

** The HENSOGRUND 2K, HENSOGRUND AQ and HENSOGRUND WB Green primer system has been tested in accordance with the test procedures defined in EAD 350402-00-1106 on galvanised steel substrates and passed the performance requirements for compatibility

HENSOTHERM® 410 KS has been assessed as being compatible with and has been tested in accordance with the test procedures defined in EAD 350402-00-1106 with the following top coats:

Topcoats				
Topcoat Reference	Topcoat Type	Tested Nominal Topcoat DFT (mm)	Permitted Topcoat Thickness Range (mm)	
			Minimum*	Maximum
HENSOTOP 84	Acrylic resin solvent based	0.05	0.050	0.075
HENSOTOP 84 AQ	Acrylic resin water based	0.05	0.050	0.075
HENSOTOP SB	Acrylic resin solvent based	0.05	0.050	0.075
HENSOTOP WB	Acrylic resin water based	0.05	0.050	0.075
HENSOTOP 2K PU	Polyester	0.077	0.077	0.116
HENSOTOP WB Green	Acrylic resin water based	0.071	0.071	0.107

* Where the permitted theoretical minimum DFT is less than typical minimum dry film thickness recommended by manufacturer, the practical information given in product data sheet must be followed.

HENSOTHERM® 410 KS has been tested in accordance with the test procedures defined in EAD 350402-00-1106, and assessed as having passed the requirements for durability with and without the following top coats:

Topcoat Reference	Durability Testing Conducted and Approved			
	Type Z ₂	Type Z ₁	Type Y	Type X
Without topcoat	√	√	-	-
HENSOTOP 84	√	√	-	-
HENSOTOP 84 AQ	√	√	-	-
HENSOTOP SB	√	√	√	-
HENSOTOP WB	√	√	√	-
HENSOTOP WB Green	√	√	√	-
HENSOTOP 2K PU	√	√	√	√

EAD 350402-00-1106 states that:

An estimated working life of 25 years shall only be assumed in the case where the applicant can offer, in addition to the above, for examination by the technical assessment body, sufficient documented proof to demonstrate the use of the reactive coating system for a period of 25 years in the environmental conditions claimed.

Rudolf Hensel GmbH have supplied such information for Type Z₂ to both Warringtonfire and BAM, who have both independently verified that the data supplied demonstrates the use of HENSOTHERM®410 KS with or without topcoat for a working life of 25 years in environmental condition Type Z₂.

HENSOTHERM®410 KS was subjected to the identification testing in accordance with the methods of identification defined in EAD 350402-00-1106 Clause 2.3.5. Tests for 'fingerprinting' have been done as described in Annex E (Thermoanalytical analyses (TG) and Infrared spectroscopy analyses (IR)).

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																															
BASIC WORKS REQUIREMENT 2: SAFETY IN CASE OF FIRE																																	
EN 13501-1	Reaction to fire	Class E																															
EN 13501-2	Fire resistance	(R15 to R90) - IncSlow (I/H Beams and Columns) And (R15 to R90) – IncSlow (Hollow Columns) (see Annex A)																															
BASIC WORKS REQUIREMENT 3: HYGIENE, HEALTH AND THE ENVIRONMENT																																	
Manufacturer's declaration and EN 16516	Content, emission and or release of dangerous substances	Product specification doesn't contain dangerous substances given in Annex XVII of REACH and the ECHA Candidate List of Substances of Very High Concern Use categories: IA1 and S/W2 Results for reactive coating emission tests are below*:																															
		<table border="1"> <thead> <tr> <th></th> <th colspan="2">3 Days</th> <th colspan="2">28 Days</th> </tr> <tr> <th></th> <th>Restriction</th> <th>HENSOTHERM® 410 KS</th> <th>Restriction</th> <th>HENSOTHERM® 410 KS</th> </tr> </thead> <tbody> <tr> <td>R-Value</td> <td>N/A</td> <td>-</td> <td>≤1</td> <td>≤1</td> </tr> <tr> <td>TVOC</td> <td>≤10000µg/m³</td> <td>≤10000µg/m³</td> <td>≤1000µg/m³</td> <td>≤1000µg/m³</td> </tr> <tr> <td>TSVOC</td> <td>N/A</td> <td>-</td> <td>≤100µg/m³</td> <td>≤100µg/m³</td> </tr> <tr> <td>Non LCI</td> <td>N/A</td> <td>-</td> <td>≤100µg/m³</td> <td>≤100µg/m³</td> </tr> </tbody> </table>			3 Days		28 Days			Restriction	HENSOTHERM® 410 KS	Restriction	HENSOTHERM® 410 KS	R-Value	N/A	-	≤1	≤1	TVOC	≤10000µg/m ³	≤10000µg/m ³	≤1000µg/m ³	≤1000µg/m ³	TSVOC	N/A	-	≤100µg/m ³	≤100µg/m ³	Non LCI	N/A	-	≤100µg/m ³	≤100µg/m ³
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BASIC WORKS REQUIREMENT 4: SAFETY AND ACCESSIBILITY IN USE																																	
EAD 350402-00-1106 Clause 2.2.4 and Clause 2.2.5	Adhesion and Durability	<ul style="list-style-type: none"> • Primer and top coat compatibility • Type Z₂ durability • Type Z₁ durability • Type Y durability • Type X durability 																															
EAD 350402-00-1106 Clause 2.3.5	Identification	Thermoanalytical analyses (TG) and Infrared spectroscopy analyses (IR)																															

* The results were assessed against emission test performed in accordance with "Principles for the Health Assessment of Construction Products" published by the German Institute for Construction Engineering (DIBt) October 2010

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:

Products	Intended uses	Level or Class	System
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 02/02/2021

By

A handwritten signature in black ink, appearing to read "Paul Duggan". The signature is written in a cursive style with a large initial 'P' and a stylized 'D'.

Paul Duggan
Deputy TAB Manager

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Annex A - Product Performance: Fire Resistance

1. This Annex relates to the use of HENSOTHERM® 410 KS for the fire protection of 'H' or 'I' shaped beams and columns, and also rectangular/square and circular hollow sections. The precise scope is given in Tables 1 to 21 which show the total dry film thickness of HENSOTHERM® 410 KS (excluding primer and top coat) required to provide classifications of R15 to R90 for 'H' or 'I' shaped beam or column section, and for rectangular/square hollow column and circular hollow column sections for various design temperatures and section factors. A summary of the salient features of the testing and assessment are shown in this Annex.
2. The product is approved on the basis of:
 - i) Approval testing in accordance with the principles of EN 13381-8:2013
 - ii) A design appraisal against this ETA adopting the graphical analysis defined in Annex E of 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 sided exposure), and also to rectangular and circular hollow column sections.
4. The data shown is applicable to steel sections blast cleaned to ISO 8501-1 Sa 2.5 or equivalent and primed with the compatible primers and top coats listed in this ETA. The primer and top coat permitted dry film thickness are provided in the body of this European Technical Assessment.
5. The data for the 'I' and 'H' shaped columns applies also to other shaped steel sections that have re-entrant details such as channels, angles and tees.
6. HENSOTHERM® 410 KS has been exposed to the slowing heating regime defined in Annex A of EN 13381-8: 2013 and has satisfied the requirements.