



## FIRE PROTECTION COATING FOR STRUCTURAL STEEL SECTIONS

TECHNICAL DATA SHEET HENSOTHERM® 421 KS

- Water-based, environmentally friendly and sustainable
- Free from halogens, APEO, borates, plasticizers, silicones and fibres (glass-fibre free)
- Classified according to DIN EN 13501-2
- Fire resistance rates from R 15 up to R 180 for open profiles, hollow profiles and hollow beams
- AgBB-tested, Non-VOC, VOC-emission class A+, **LEED v4**
- DGNB Navigator Registration: 3E4MHK



Member of

**DGNB**

Deutsche Gesellschaft für Nachhaltiges Bauen  
German Sustainable Building Council





# HENSOTHERM® 421 KS

## BENEFITS



### Environmental Benefits

- Water-based intumescent coating system
- Free from halogens, APEO (alkylphenol ethoxylates), borates, plasticizers, silicones and fibres
- Non-VOC acc. to ISO 11890-2, LEED confirmed, LEED v4
- Environmental product declaration acc. to ISO 14025 and EN 15804: applied for

Germany: The tested product complies with the requirements of DIBt (October 2010) and AgBB (June 2012).

France: CMR-Substances: The tested product fulfills the requirements of the French regulation DEVP0908633A of 30 April 2009 and DEVP0910046A of 28 May 2009.

VOC-emission classification: The tested product is classified to **VOC-emission class A+**. This recommendation is based on the French regulations of March 23, 2011 (décret DEVL1101903D) and of April 19, 2011 (arrête DEVL1104875A).

Belgium: The tested product complies with the requirements of the „Royal Decree for establishing threshold levels for the emissions to the indoor environment from construction products for certain intended uses (draft December 2012).“

### Technical Performance

- Optimal surface appearance by application with airless spraying achievable; long fire resistance rates with low layer thicknesses; maintenance-free
- Approved also for the use on galvanized profiles
- Top coat in RAL/NCS or individual colour shades available
- Suitable for shop application (fast drying)
- Physical life according to ETAG No. 018-1 up to 25 years, can be prolonged for special projects
- Open profiles up to Hp/A 450m<sup>-1</sup>, hollow profiles up to Hp/A 425m<sup>-1</sup> and hollow beams up to Hp/A 165m<sup>-1</sup> (Tcrit. 500°C)
- Specific gravity: 1,34 kg/l, volume solids: 72% ± 3% (measured acc. to ISO 3233)

### Additional

- High efficiency due to low material consumption and fast drying times
- Monitored by independent third party institutes

Our **HENSOTHERM®** and **HENSOMASTIK®** fire protection coating systems are developed and manufactured exclusively at our company base in Börnsen near Hamburg.



## QUALITY MARKS



LEED v4



# TECHNICAL INFORMATION

## Approval / Classification

- Approved according to DIN EN 13381-8
- ETA No. 20/1228
- CE marking according to 93/68/EWG
- DGNB Navigator registration code: 3E4MHK
- Environmental product declaration: EPD-RHG-20190097-IAC1-EN

## Application Area

- For indoor use only
- Open steel profiles: R 15 – R 150 for columns, beams and tension members (utilization factor in cold condition  $\leq 78\%$ )
- Hollow profiles: R 15 – R 180 for columns
- Up to R 180 usable without top coat in dry indoor conditions<sup>1)</sup>
- According to ETAG No. 018-2, durability class Y/Z1/Z2 [Y (semi exposed): for indoor use and in open buildings **without driving rain and condensation**]]
- Structural steel according to EN 10025-1 (class S, not S185), machine-building-steel (class E) is not permitted
- Coated steel components shall not be receive coverings or miscellaneous jackets which prevent the intumescent fire protection coating from foaming/expanding! Only those components may be connected force-fit, which comply with the same fire resistance rate.

## Instructions for Application

- The coating system consist of primer HENSOGRUND\*, fire protection coating HENSOTHERM® 421 KS and top coat HENSOTOP\*
- The coating system should only be applied by trained staff!
- System should be preferably applied and dried at a temperature above +5 °C and at a relative humidity below 80 %
- Surface temperature should be at least +5 °C above dew point, during application see Corrosion Protection Standard EN ISO 12944-7
- In line with good painting practice, application should not take place in conditions which are deteriorating, e.g. where the temperature is falling or where there is a risk of condensation forming on the steel
- Steel surface should not be warmer than +35 °C during application and drying time
- **The ambient conditions during application must be documented in a report according to EN ISO 12944-7 and -8**

## Shop Application

The temperature of the steel surface and the ambient temperature has to be between min. +10 °C and max. +35 °C. For further questions, please contact our technical support team.

## Surface Preparation / Primer

### Bare Profiles

- Sandblasting Sa 2.5 according to EN ISO 12944-4, then application of primer HENSOGRUND WB Green\*, HENSOGRUND 1966 E\*, HENSOGRUND 1K AK\* or HENSOGRUND 2K EP\*
- Manual cleaning possible, PSt 2 according to EN ISO 12944-4, after manual cleaning application of HENSOGRUND 1K AK\*

### Primed Profiles

- HENSOTHERM® 421 KS is designed to be applied over suitable-prepared and primed substrate
- The compatibility between HENSOTHERM® 421 KS and unknown already applied primers need to be checked; any damage (corrosion, impact e.g.) must be repaired carefully with the particular type of primer used or other compatible primers

Before the application of HENSOTHERM® 421 KS already primed surfaces must be checked for damages and dry film thickness if they have been exposed to the weather for longer. If necessary, repair work is needed! For further information see Technical Data Sheets for HENSOGRUND primers.

### Galvanized Profiles

- Surface has to be cleaned to remove contamination and to ensure adhesion, then priming with HENSOGRUND WB Green\* or HENSOGRUND 2K\*
- Galvanized components must be tempered (heated) before coating with HENSOGRUND WB Green\* or HENSOGRUND 2K\* (Blistering!)

## Application

Before application stir up thoroughly with slow speed! Immediate cleaning of equipment after use with water!

### Airless Spraying

- A material temperature of about +20 °C is recommended for achieving an optimal spraying behaviour and result
- If needed thinning with max. 3% water
- Recommended operation pressure 200 – 250 bar
- Nozzle size 0.017" – 0.025"; flow rate > 4 l/min
- All filters should be removed
- Recommended coverage rate for the 1st layer on a primed surface 500 g/m<sup>2</sup> (approx. 250 µm dry film thickness)
- Each further layer can be applied with up to 1,000 g/m<sup>2</sup> (approx. 500 µm dry film thickness)
- Typical coverage rate of HENSOTHERM® 421 KS applied in one layer depends on the type of steel profile and the position within construction

### Brushing and Rolling

- Rolling by lambskin roller, brushing with long-bristled Chinex-bristle

**Note:** During the application ensure sufficient ventilation and aeration. If necessary use a fan for air circulation.

## Drying Time

- The drying time depends on temperature and relative humidity
- At a temperature of approx. +20 °C and a relative humidity of approx. 65% the drying time for each layer (up to 1,000 g/m<sup>2</sup>) is at least 24 hours till next application
- Each layer must be dried through (fingernail test positive) before the next application
- Lower temperatures, higher relative humidity and insufficient air movement can prolong drying time

<sup>1)</sup> If surfaces are exposed to cleaning the use of the top coat HENSOTOP is mandatory!

\* Please consult the respective technical data sheet!

# TECHNICAL INFORMATION

## Top Coats

HENSOTOP top coats offer the possibility of colored design, protection against moisture and should be applied when the surfaces, during the usage, are exposed to environmental influences, regular cleaning and similar external influences. Do not apply the top coat before the HENSOTHERM® fire protection coating is fully dried! At the earliest after 24 hours and after a positive fingernail test. Usage without top coat is possible, but only in dry indoor conditions without condensation. If steel surfaces are regularly exposed to intense heat/high temperatures > +45 °C, do not use dark colours as a top coating. HENSOTOP top coats are available in RAL or NCS colour shades and on request in individual colour shades.

For HENSOTHERM® 421 KS the following top coats\* are compatible: HENSOTOP WB Green\*, HENSOTOP SB\*, HENSOTOP 2K PU\*.

## Storage and Transport

- Storage and Transport free from frost!  
Preferably at a minimum of +5 °C to a maximum of +30 °C
- Shelf life of unopened pails: 12 months
- Opened pails must be sealed carefully after use!

## Packaging

12.5 kg and 25 kg plastic pails

## Precautions for Safety Use

Use HENSOTHERM® 421 KS in accordance with all applicable local and national regulations.

Giscode: M-DF01

## Environment, Health and Safety

As regulations are often revised please request for the actual Material Safety Data Sheet before using the product.

\* Please consult the respective technical data sheet!

In case of any questions please contact our technical support team!

For full product documentation and other information to download please visit our website [www.rudolf-hensel.de/421KS](http://www.rudolf-hensel.de/421KS)

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