

**HENSEL****FIRE PROTECTION SYSTEMS**

## HENSOTHERM® 820 KS

### PRODUCT INFORMATION

Water-based 1C coating system for upgrading concrete structural members in indoor areas

- Fire resistance classes up to 240 minutes
- Tested in accordance with the European standard EN 13381-3:2015
- Applications: carriers / supports / flat ceilings / walls / ribbed ceilings / prestressed concrete hollow ceilings
- No loads on the surrounding structure, space saving → no headroom loss, maintenance free
- European Patent No. EP 2686391 B1



Member of

**DGNB**

Deutsche Gesellschaft für Nachhaltiges Bauen  
German Sustainable Building Council



**LEED**



# HENSOTHERM® 820 KS

Renovation work on buildings **without a concrete covering** may necessitate upgrading measures on the exposed reinforced concrete parts if they are to comply with the required fire resistance class. Not only the steel reinforcements, also the concrete itself expands, and this to varying degrees at temperatures as low as 330 °C. There is therefore a potential risk of burst-offs and impaired structural integrity.

**HENSOTHERM® 820 KS** is a water-based, single-component fire protection coating for upgrading concrete structural members in indoor areas. In the event of fire, HENSOTHERM® 820 KS complying with the required fire protection class forms a heat-insulating barrier of carbon foam and thus prevents the concrete structural elements from heating up and the concrete from flaking off the steel reinforcement. The system is ideal for the renovation and repurposing of buildings that require additional fire protection on elements without a shielding concrete cover.

## Approval/classification

- Flat ceilings / walls: summary report Warringtonfire CT/345425 No. 3
- Carriers/supports: summary report Warringtonfire CT/339816 No. 2
- The properties of the surface applications have been verified in the summary reports.
- Prestressed concrete hollow ceilings: Efectis Nederland B.V. | report: 2012-Efectis-R0556 [Rev1] 2)
- Building material approval abZ No. Z-19.11-2196
- VKF approval no. 27213 + 27215, BS EWCL Certificate no. ME 5119
- European Patent No. EP 2686391 B1 / contracting states: AT, DE, DK, ES, HU, LI, NL, PL, SE

## Environment

- ✓ Water-based
- ✓ Ideal for Minergie (A/P) Eco, Priority 1 ecoBKP/ecoDevis or DGNB
- ✓ Free of APEO (alkyl phenol ethoxylate), halogens, and borates
- ✓ A+ VOC emission class, LEED confirmation, AgBB tested

## FIRE RESISTANCE UP TO 240 MINUTES



Prestressed concrete hollow ceilings

Reinforced concrete carriers and supports

Flat concrete ceilings



## Field of application

- Indoor areas protected from environmental effects
- **Concrete flat ceilings / concrete walls:** max fire resistance duration 240 minutes
- **Concrete carriers / concrete supports:** max fire resistance duration 150 minutes
- **Prestressed concrete hollow ceilings:** max fire resistance duration 120 minutes
- **Ribbed ceilings:** Also possible on request are ribbed ceiling upgrades with project-related expertises

**NOTE:** We recommend that you consult with the fire protection expert, the architect, or the responsible planning authority before installing the fire protection system. On request, a project-related expertise can be drawn up.

**Performance range / product properties**

- Indoor applications protected from adverse environmental effects
- No loads on the surrounding structure, space saving, no headroom loss, burst-offs prevented for up to 240 minutes on 25/30 strength concrete
- Maximum concrete strength (VKF approval no. 27213 + 27215): C50/60
- Small coating thicknesses (DFT from 420 µm) for high cost effectiveness, maintenance free
- Fast drying times
- Compatible with diverse repair mortars
- Carbonising blocker impeding the infiltration of harmful CO<sub>2</sub> and SO<sub>2</sub>
- Optional colour scheme with top coat HENSOTOP WB Green
- Easy applications in the form of airless spraying, brushing, rolling
- Visually appealing, smooth surfaces, colour white, approx RAL 9010

**Coating structure**

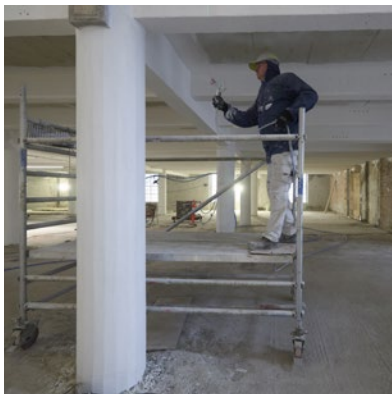


- 1 Repair mortar
- 2 BETON-CARBONSPERRE or Betongrund AQ
- 3 HENSOTHERM® 820 KS
- 4 HENSOTOP WB Green

Coating structure for indoor concrete parts		Flat ceilings / walls	Carriers/ supports	Ribbed ceilings	Prestressed concrete hollow ceilings
Concrete surfaces must be <b>rough</b> , have good grip, and be free of dusts, oils, and greases.		●*	●*	●*	●*
Primer	BETON-CARBONSPERRE [2 × 140 g/m <sup>2</sup> ]	●	●	●	●
	Betongrund AQ [approx 120 g/m <sup>2</sup> ]	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>	○ <sup>1</sup>
Insulation layer former	HENSOTHERM® 820 KS	●	●	●	●
Top coat, with colour	HENSOTOP WB Green	○	○	○	○

- = mandatory use!
- <sup>1</sup> = alternatively, in dry indoor areas when infiltration by CO<sub>2</sub> and SO<sub>2</sub> need not be prevented (protected from adverse environmental effects)
- = optionally in dry indoor areas (protected from adverse environmental effects)
- \* Old coatings must be removed free of residue. Blast treatment

**Coating instructions**



**Preparing the concrete substrates / surface requirements**

- Remove old coatings, clean concrete substrates, repair damaged areas
- The concrete surfaces must be rough, have good grip, and be free of dusts, cement clouds, efflorescences, oils, and greases.
- The concrete must be dry (test as defined in ASTM D 4263) and/or residual moisture of max 4% according to CM

# HENSOTHERM® 820 KS

## Preparations on damaged concrete surfaces

Chipped spots, cracks, unevenness, roughness, pores, and blowholes must be sealed with DisboCRET repair mortars (please see the manufacturer's instructions).

- Defects: DisboCRET 505 Feinspachtel or DisboCRET 506 Planspachtel (with 15–20% sand filler)
- Cracks: DisboCRET 505 Feinspachtel or DisboCRET 506 Planspachtel
- Alternatively, comparable STO and Ardex products may be used.



## Priming / carbonising blocker

- Primer BETON-CARBONSPERRE prevents contaminant and water penetration. Impedes the infiltration of harmful CO<sub>2</sub> and SO<sub>2</sub>
- Alternatively, Betongrund AQ, but only in indoor areas protected from adverse environmental effects!

## Insulation layer former

**HENSOTHERM® 820 KS** improves the fire-resistance duration of concrete flat ceilings/walls up to 240 minutes, that of reinforced concrete beams and supports up to 150 minutes, that of prestressed concrete hollow ceilings up to 120 minutes, and that of reinforced concrete ribbed ceilings (with project-related expertise).

In the event of fire, HENSOTHERM® 820 KS forms a heat-insulating barrier of carbon foam and thus prevents the concrete structural elements from heating up and the concrete from flaking off the steel reinforcement – European Patent No. EP 2686391 B1.

## Top coat

**HENSOTOP WB Green** provides the option of RAL and DB colour schemes and protection against moisture. A top coat should be applied when used areas are exposed even to low-level environmental impact.



coated | uncoated

### Methods for measuring coating thicknesses

Dry film thickness (DFT) can be measured electronically by means of the following methods:

- 1. Steel plates:** Before commencing the application, use assembly adhesive or double sided adhesive tape to affix primed<sup>1</sup> or galvanised steel plates of 10 cm x 6 cm and approx 1–2 mm thickness to the dry concrete surface. Do NOT forget to note the position of the affixed steel plates, e.g. on a drawing. After coating and drying (nail hardness), they can then be located easily and quickly, and an electronic meter applied to them to measure the dry film thickness.

<sup>1</sup> The dry film thickness of the primer must be deducted from the measured overall dry film thickness.

- 2. Aluminium foil:** Before commencing the application, use spray/assembly adhesive or double sided adhesive tape to affix pieces of aluminium foil of 10 cm x 6 cm to the dry concrete surface. Do NOT forget to note the position of the affixed aluminium foil e.g. on a drawing. After coating and drying (nail hardness), they can then be located easily and quickly, and an electronic meter applied to them to measure the dry film thickness.

**NOTE:** The steel plates or aluminium foil at the measuring sites remain under the coating because they do not compromise the fire protection properties of HENSOTHERM® 820 KS.

- 3. Calculating the dry film thickness:** The dry film thickness (DFT) can also be calculated as a function of the ratio of total coated area in m<sup>2</sup> to the total material consumption in kg. The total material quantity is taken to be the net quantity of material applied. Pot and spatter losses must be deducted from this value.

$$\text{DFT } [\mu\text{m}] = \frac{\text{total material consumption [kg]}}{\text{coated area [m}^2\text{]}} \times 500$$

**NOTE:** While HENSOTHERM® 820 KS is being applied, the wet film thickness (WFT) should be checked regularly by means of a suitable gauge.

### Notes on cladding/suspensions

Suspensions, threaded rods, pins, etc., may be fitted, but must not exceed a diameter of 20 mm. Other bearing sites may not exceed a diameter of 25 mm. Unless the quantity exceeds 1 per square metre, no compensation measures are necessary, and any heat input in the event of fire may be neglected.

The coatings may not be cladded or jacketed: this may prevent the insulation layer former from foaming.

(If necessary, request spacings)

### Labelling

After the coating work has ended, the treated parts must be provided with the permanent labels provided for this purpose by Rudolf Hensel GmbH.

### Use and inspection in dry indoor areas

The coating system's fire protection properties are safeguarded over the service life only when the system is maintained in proper working condition. The developer/principal must be referred thereto by the applicator / commissioned company. The person reporting to the building authorities must ensure that the applied reactive fire protection coating is subjected to regular visual inspections, at least once every two years, of its condition and for damage caused e.g. by the action of water or its vapour (precipitation and condensation), corrosion, physical agents, etc. Any damage must be documented and remedied immediately (see manufacturer's instructions).

**BENEFITS OF FIRE PROTECTION COATINGS ON CONCRETE**



- ✓ Colour: white, approx RAL 9010
- ✓ Top coat HENSOTOP WB Green for free choice of colour schemes
- ✓ Fire resistance duration of concrete and reinforced concrete structural parts of up to 240 minutes



- ✓ Causes hardly any structural loading, space saving  
→ no loss of headroom, maintenance free



- ✓ Ideal for Minergie (A/P) Eco, corresponding to Priority 1 Eco-BKP



- ✓ Green product: Contains no halogens, APEO, borates, and plasticisers
- ✓ Low VOC < 6 g/l, A+ VOC emission class, LEED confirmation, AgBB tested



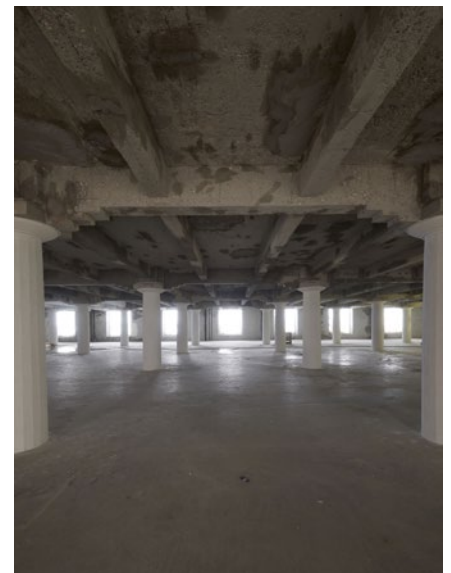
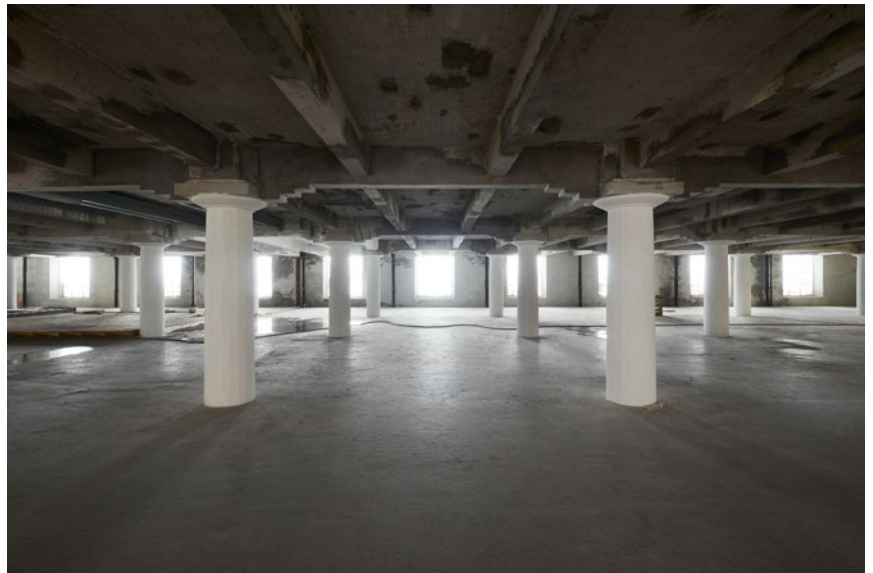
**Mineralvandhuset in Carlsberg Byen | Copenhagen (DK)****Patented concrete fire protection for a sustainable district**

In Denmark, Entasis and its team of architects play a leading role when it comes to sustainable urban planning, including planning for the repurposing of the derelict industrial site of the Carlsberg Group in Copenhagen. In the years ahead, a new city quarter for work, training and leisure will be created on the 19 hectare site with listed factory buildings, including the villa of company founder Jacob Christian Jacobsen.

The “Mineralvandhuset” is located in the historic centre of the Carlsberg Byen district and will be converted into 49 residential units consisting of two-room apartments, family apartments, penthouse apartments and studio apartments on one and a half levels in line with the designs of Dorte Mandrup Architects from Copenhagen. The building was completed in December 2022.

**Protected by the HENSOTHERM® fire protection system for concrete**

In order to improve the fire resistance time of the concrete components due to the lack of reinforcement cover after the renovation of the historic building, it has been retrofitted with the water-based fire protection system HENSOTHERM® 820 KS (European Patent No. EP 2686391 B1) into the fire resistance class up to R 90.



Our technical advisers will be pleased to assist you with your enquiries.  
Further details can be downloaded from: [www.rudolf-hensel.de/820KS](http://www.rudolf-hensel.de/820KS)

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