

# HEGSEL® Therm 4410

Advanced Acrylic Water-Borne Insulation Coating

*You Build, We Protect!*

## Description:

**HEGSEL Therm 4410** is a two-component advanced acrylic water-borne insulation coating designed to provide exceptional thermal insulation, energy conservation, and fire protection. This innovative product forms a seamless, hydrophobic layer that resists water retention, ensuring consistent insulation performance and reducing the risk of corrosion under insulation. The system incorporates a unique blend of aerogel (a porous solid composed mainly (>90%) of air, with a pore size smaller than the mean free path of air molecules (~60nm)) and encapsulated fire protection pigments, delivering outstanding insulation, fire resistance, and safety.

**HEGSEL Therm 4410** can be applied in single or multiple layers as needed. Its unique aerogel-based formulation provides excellent thermal insulation, fire protection, high weather durability, anti-mold properties, and soundproofing. The high film thickness per coat enhances productivity and reduces costs in both newbuild and maintenance projects.

**HEGSEL Therm 4410** can be followed by the application of **HEGSEL Therm 4412** as the designated topcoat. **HEGSEL Therm 4412** is a single-pack, water-borne insulation coating used as a topcoat or sealer over **HEGSEL Therm 4410**. It forms a hydrophobic barrier, preventing water ingress and ensuring long-term thermal insulation performance.

## Characteristics:

- Provides excellent thermal insulation and fire protection in thin-layer coating
- Strong adhesion to various surfaces, including metals and mineral substrates
- Hydrophobic, preventing water ingress and reducing the risk of CUI
- Resistant to humidity and temperature fluctuations
- Environmentally friendly with no toxic emissions during application or in case of fire
- Safe-touch surface with anti-condensation and anti-mold properties
- Allows high film thickness with quick recoating capabilities

## Application Areas:

**HEGSEL Therm 4410** is suitable for industrial and building applications. It provides thermal insulation, fire protection, and anti-condensation benefits for vessels, pipework, structural steelwork, and building interiors and exteriors. It is effective in rooms, corridors, doorways, stairways, etc. The product ensures safety with its safe-touch feature for hot surfaces and supports energy conservation.

## Curing Time:

Curing times for the mixed product at a 2000 microns DFT:

Touch dry	Hard dry	Dry to handle	Fully cured
30 min	120 min	3 hrs	24 hrs

**Note 1:** The specified drying times apply to standard conditions. However, since moisture-curing products are influenced by relative humidity, actual drying times in the field may vary.

**Note 2:** The above values are determined for a 2000-micron DFT under standard conditions, with a surface temperature of 20 °C.

## Overcoating:

Temperature	10 °C	20 °C	30 °C	40 °C
<b>HEGSEL Therm 4410</b>	3 hExt	2 hExt	90 minExt	60 minExt
<b>HEGSEL Therm 4412</b>	24 hExt	18 hExt	16 hExt	12 hExt

**Note:** The above values apply to atmospheric mild conditions and may vary under different environmental factors.

## Packaging:

The product is supplied in the following standard package sizes:

Product	Size	Package
<b>HEGSEL Therm 4410 Base</b>	15 kg	Pail
<b>HEGSEL Therm 4410 Powder</b>	2.1 kg	Plastic bag

## Storage:

The products must be stored in a cool and dry place, away from direct sunlight, rain and snow. The product must not be stored, transport or used at temperatures below 5 °C or above 35 °C. Higher storage and transport temperatures can reduce the shelf life. The containers are to be kept closed tightly. Product must be stored according to local legislation.

Product	Temperature	Shelf Life
<b>HEGSEL Therm 4410 Base</b>	25 °C	24 Months
<b>HEGSEL Therm 4410 Powder</b>	25 °C	24 Months

**Note:** If the shelf life is passed, the materials must be tested prior to use.

## 1. Surface Preparation

Before applying the coating, ensure the surface is completely clean and free from oil, rust, grease, salts, and any surface contaminants. Use a suitable industrial detergent or degreasing agent to eliminate dirt and contaminants. If possible, perform pressure washing to achieve a thoroughly clean surface. In cases of salt contamination due to exposure to saline environments, apply an appropriate surface decontaminant to effectively remove salts. Proper surface preparation is crucial for optimal adhesion and long-term coating performance.

## 2. Environmental Conditions

Environmental factors, including wind speed, may influence the final parameters needed to optimize the material's application.

The specified environmental conditions must be complied with during surface preparation. During the application, the substrate must be kept completely dry. No moisture (condensate, mist, etc.) may get onto the surfaces that are to be protected. The construction site has to be protected against direct sunlight, rainfall and draught.

Environmental Conditions	Value
Relative Humidity	>10% and < 95%
Surface / Material / Air Temperature	>10 °C and < 90 °C
Optimum Processing Temperature	20 °C - 25 °C

Elevated or decreased temperatures could affect the working time and consistency of the mixture. As a result, consumption, application performance and layer thickness may vary.

## 3. Application Tools

- Air-assisted spray
- Compressor
- Low-pressure pump
- Spray gun

For coating application, use a 9:1 to 15:1 low-pressure pump with a ½-inch PTFE-lined paint hose (max. 40 m). A texture spray gun is required, with a 4 - 6 mm cap for **HEGSEL Therm 4410** and 3 mm for **HEGSEL Therm 4412**. No mesh filters should be used. Set fluid pressure to 2 - 4 bar, with air assist pressure 1 - 4 bar higher, adjusted to field conditions. Remove any suction tube or hopper, placing the pump's lower end directly in the paint. Follow the manufacturer's instructions for proper operation.

For proper spray application, a compressor with a minimum capacity of 50 cubic feet per minute is required. The pump air inlet pressure and air assist inlet pressure should be maintained between 29 - 43 bar. Additionally, the compressed air must be free of oil and verified clean in accordance with ASTM D4285 to ensure optimal performance.

**Note:** Airless spray shall not be used.

Using the right application tools is essential for a successful application. For pump and

Compressor specifications and its components, please contact HEGSEL.

## 4. Mixing

The packaging of this product is designed for mixing one unit of each component. As the mixed kit volume exceeds the capacity of the pail in which the base is supplied, a 60-litre plastic open-head drum would be a suitable container for mixing. Make sure the container is thoroughly cleaned before use.

### HEGSEL Therm 4410

- 1- Thoroughly mix the liquid-based component using a power mixer with an appropriately sized agitator blade, at 700 rpm for at least 2 minutes.
- 2- Pour half of the liquid-based component into the mixing container. Slowly lower the bag of Powder into the container and empty it carefully, avoiding the formation of a dust cloud that could result in material loss.
- 3- Pour the rest of the liquid-based component into the container and mix it with the powder component for at least 4 minutes at 700 rpm. Start the agitation slowly to ensure a smoother incorporation of the aerogel powder into the liquid base before increasing the speed for thorough mixing.
- 4- Inadequate mixing or incomplete mixing can affect the performance of the product, so ensure thorough mixing by scrapping down the side of the mixing container.
- 5- Perform a sampling check to verify that the specific gravity meets the requirement of 0.4 or lower.

### HEGSEL Therm 4412

- 1- Mix the product directly in the supplied pail as it is a single-pack formulation.
- 2- Use a power mixer with an appropriately sized agitator blade and agitate at 700 rpm for at least 2 minutes.
- 3- Ensure that the pail is securely positioned before starting the agitation to prevent movement.
- 4- Monitor the mixing process to ensure a homogeneous and uniform consistency is achieved.

**Note:** Do not dilute the products with water or any other solvent, as this may damage the material and make it unusable.

## 5. Application

In environments where corrosive agents are present and the substrate is exposed to potential corrosion, it is recommended to apply either the HEGSEL Pox primer or the HEGSEL Coat single-layer anti-corrosion coating as a protective layer beneath the **HEGSEL Therm 4410** system. For further technical guidance, please consult HEGSEL.

Ensure that the surface is clean and prepared properly, as the effectiveness of **HEGSEL Therm 4410** systems is closely linked to the quality of surface preparation and application. Only experienced and trained applicators should perform the

application, adhering strictly to the insulation specifications and this guide.

**HEGSEL Therm 4410** can be applied in wet film thickness (WFT) of up to 8 mm per coat. However, for quicker overcoating and faster job completion, it is recommended to apply in 3 - 4 mm WFT layers. The desired thickness per coat should be achieved through multiple passes to ensure uniform coverage and performance.

As a top coat, **HEGSEL Therm 4412** can be applied in wet film thickness (WFT) of up to 3 mm per coat, achieved through multiple passes to ensure uniform coverage and optimal performance.

Increase the air assist pressure to ~ 0.5 bar to minimize the risk of backfilling in the spray gun and air line. Use a non-return valve at the gun and air line interface to prevent backflow.

After mixing, place the container under the pump inlet. Ensure the hopper or siphon is removed. Gradually increase the pump air inlet pressure until the pump begins to stroke and material is visible at the spray gun. Clear any fluid from the lines into a waste bucket before application. Avoid re-circulating the product into the mixing pail.

Once **HEGSEL Therm 4410** is visible at the spray gun, attach the spray cap and adjust the air assist pressure to achieve an optimal spray pattern.

Maintain a distance of approximately 30 cm between the spray gun and the substrate during application.

Regularly check wet film thickness using standard wet film gauges or adapted 'dip' gauges. Brush out WFT gauge marks to prevent defects in the applied coating.

Apply the product evenly, avoiding runs, drips, and sags. Correct any defects while the product is still wet. Inspect the **HEGSEL Therm 4412** topcoat visually for pinholes or discontinuities (holidays) and recoat as needed.

Use the entire mixed batch of **HEGSEL Therm 4410**. If the coating process is interrupted for more than 45 minutes, check the specific gravity before continuing. If the specific gravity exceeds 0.4, discard the batch.

**HEGSEL Therm 4410** and **HEGSEL Therm 4412** are acrylic-based insulation coatings designed for high-thickness applications, where drying occurs through physical evaporation. After applying each layer, drying checks must be performed before recoating with itself or applying the **HEGSEL Therm 4412** topcoat. If the coating is not fully dried before applying the next layer, moisture can become trapped within the coating. Applying additional layers will further hinder water evaporation from the underlying coats, keeping the coating soft and increasing the risk of damage during handling and transportation, as well as potential blistering when exposed to heat. In such cases, the surface may feel dry to the touch but remain soft under pressure.

The thumb test is a straightforward method to assess the drying level of the insulation coating. Press the thumb onto the surface

with a force of 4 kg; the depth and recovery of the mark provide an indication of the coating's dryness.

## 6. Consumption

To achieve a 1 mm dry film thickness (DFT), approximately 1.2 mm wet film thickness (WFT) is required. The material consumption rate for this thickness is as follows:

Product	Consumption (g/m <sup>2</sup> )
HEGGEL Therm 4410	540
HEGGEL Therm 4412	900

**Note:** Maximum film thickness for HEGGEL Therm 4410 is 5 – 8 mm and for HEGGEL Therm 4412 is 3 – 5 mm.

**Note:** A mixed kit of HEGGEL Therm 4410 (17.1 kg) provides approximately 42.6 litres of coating.

## 7. Repairing Defects

Damaged or scored surfaces on fully dried films can be repaired and leveled using a putty knife or trowel. Remove all loose material until a solid, well-adhered edge is achieved, and feather the edges smoothly. Apply fresh HEGGEL Therm 4410 into the gap, ensuring not to apply excessive pressure that could compress the coating. Allow the new coating to dry completely, using the thumb test to verify readiness for overcoating, before applying HEGGEL Therm 4412 as a topcoat by spray or roller. If a section of the coating needs to be removed, it can be cut away with a knife while the coating is still soft. Once fully

dried, mechanical tools such as a grinder may be required for removal.

## 8. Cleaning

After application, spray equipment should be flushed with clean water, and all components disassembled and cleaned properly. Use fresh product and clean tools to avoid contamination.

## 9. Safety Measures

Use adequate personal safety equipment. Ventilation must be ensured for all work performed.

The material safety data sheets of the individual components, the safety instructions on the packing (label) as well as the legal requirements for handling hazardous materials must be observed.

## Technical Data

Title	Standard	HEGGEL Therm 4410	HEGGEL Therm 4412
Solids Content	-	~ 67%	~ 70%
Density (Wet)	-	~ 0.23 g/cm <sup>3</sup>	~ 0.70 g/cm <sup>3</sup>
Density (Dry)	-	~ 0.22 g/cm <sup>3</sup>	~ 0.60 g/cm <sup>3</sup>
Hardness	-	30 – 40 Shore A	65 – 70 Shore A
Thermal Conductivity $\lambda_{23/50}$ @10 °C mean temperature	EN 12664:2001	~ 33.5 ± 1% mW/mK	~ 64.0 ± 1% mW/mK
Water Vapor Transmission Rate	-	25 g/m <sup>2</sup> d	-
Sd-Value (8 mm thickness) (Diffusion Equivalent Air Layer Thickness)	Class V2 acc. DIN EN 1062-1	0.76 m	-
Heat Flux Density (q)	EN 12664:2001	60.24 W/m <sup>2</sup>	-
Thermal Insulance (R-value)	EN 12664:2001	0.25 m <sup>2</sup> K/W	-

HEGGEL Therm 4410; Revision No: 1.00 / Last Revision Date: 19.05.2025

All information contained herein is based on the current state of our knowledge and practical experience at the time of release. Therefore, please make sure that this is the latest edition of the Technical Data Sheet. All data are only intended as a guideline for informational purposes and do not constitute a legally-binding warranty of the suitability for a certain purpose of use, due to its dependence on site conditions and possible processing, use and applications. All information contained in this technical datasheet is subject to change without notice.

**HEGGEL GmbH**

Hutropstr. 60  
45138 Essen  
Germany

Tel: +49 201 17003 270

Fax: +49 201 17003 277

E-Mail: [info@heggel.de](mailto:info@heggel.de)

Web: [www.heggel.de](http://www.heggel.de)