HEGGEL®

You Build, We Protect!

NEWSLETTER

HEGGEL® Therm 4410

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Revolutionizing Thermal Protection: Meet HEGGEL Therm 4410

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Insulation, Safety, and Durability Combined

> Thermal Management: A Core Element of Industrial Reliability

In nearly every industrial operation, from energy systems to chemical processing, managing heat is critical. Elevated surface temperatures, thermal losses, and fluctuating operating conditions pose challenges not only to performance but also to safety, energy efficiency, and equipment lifespan.

To address these challenges, thermal insulation has long been a fundamental layer of protection. Whether applied to pipelines, vessels, tanks, or structural components, it plays a vital role in reducing heat transfer, controlling condensation, and maintaining surface temperatures within safe, regulated limits.

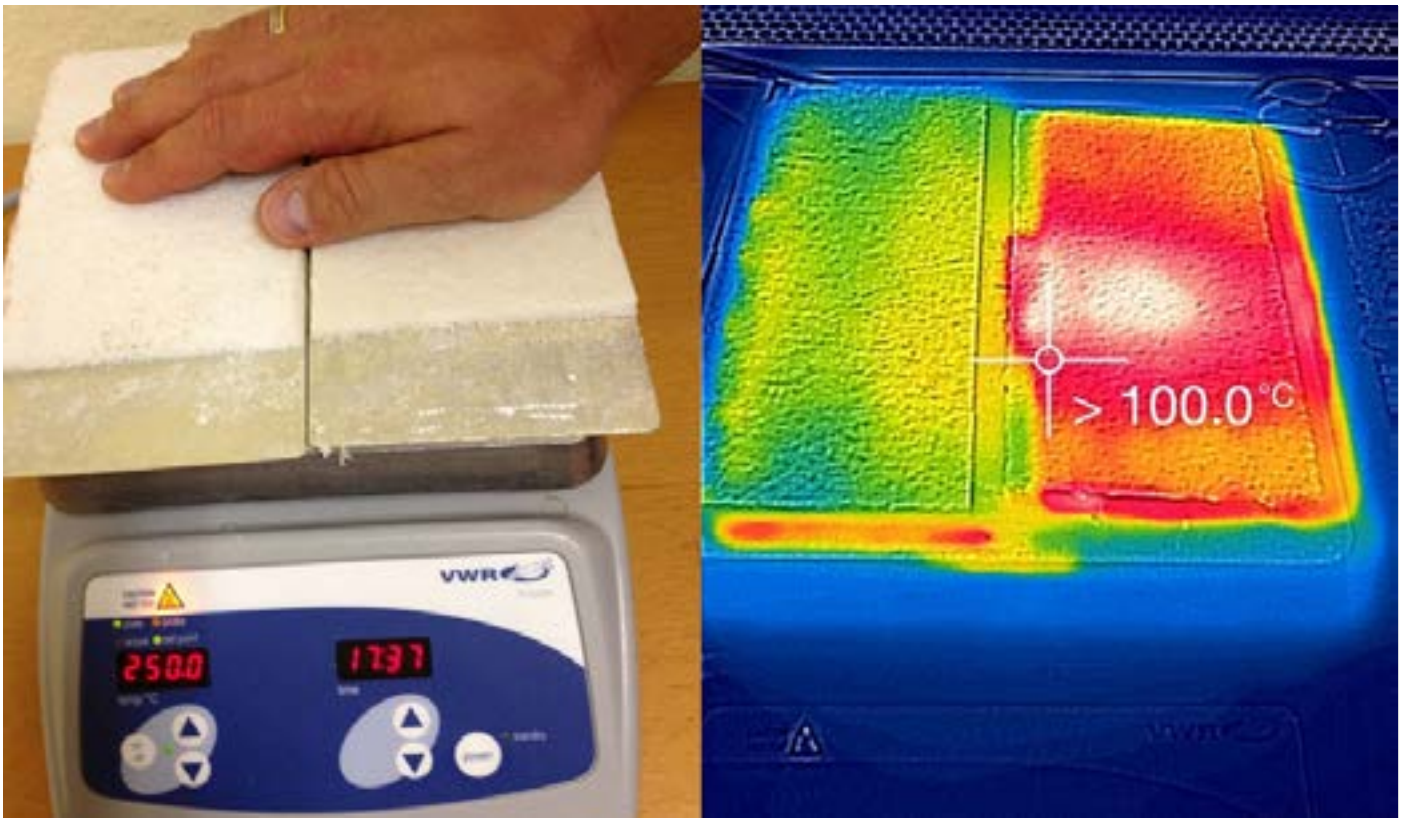
> Limitations of Conventional Insulation Systems

Conventional insulation systems such as mineral wool, glass wool, polyurethane foams, and metal-clad wraps, often fall short in real-world industrial conditions. These materials are typically bulky and heavy, adding significant weight to structures and requiring installation space. Their rigidity also makes them difficult to apply on complex or confined surfaces. Seams and joints allow for moisture ingress, while retained water is a major contributor to Corrosion Under Insulation (CUI). Over time, vibration, thermal cycling, and environmental exposure degrade their performance and increase maintenance costs.

> A closer look at common materials reveals specific limitations:

- **Glass Wool / Rock Wool:** Effective insulators, but highly moisture-absorbent, relatively thick, and dependent on protective cladding
- **Bitumen-Based Coatings:** Inflexible and non-breathable, with limited UV and heat resistance, leading to surface cracking and early degradation
- **XPS (Extruded Polystyrene):** Combustible, brittle, and unsuitable for high-temperature applications despite its water resistance
- **PU Foam (Polyurethane):** Offers good initial performance, but is flammable, UV-sensitive, and difficult to repair once damaged.

These systems often require mechanical fasteners, joints, and vapor barriers, each introducing potential weak points and added complexity. Their added thickness and structural load, combined with limited durability in harsh conditions, make them less suitable for modern industrial needs, especially in retrofit, high-exposure, or space-restricted applications.



The Need for a Smarter Approach

Modern infrastructure requires modern insulation solution that goes beyond traditional systems. It must provide:

- Reliable thermal resistance with minimal thickness
- Fire protection and safe-touch surface temperatures
- Hydrophobic properties to block water ingress and prevent CUI
- Compatibility with a variety of substrates and geometries
- Ease of inspection, repair, and reapplication
- Environmental compliance, non-toxic, non-combustible

This evolution has led to the rise of high-performance, liquid-applied insulation coatings that combine insulation, corrosion prevention, and fire resistance in a compact and efficient format.

A New Generation of Coating-Based Insulation

Unlike traditional insulation wraps or panels, thermal insulation coatings are applied directly to the substrate, forming a seamless, uniform layer. Their sprayable nature allows them to conform precisely to complex geometries, eliminating the need for mechanical fastening, joints, or bulky materials. The result is a lightweight yet robust thermal barrier that performs where conventional systems often fail.

In response to the industry‘s growing need for efficient, reliable, and easy-to-apply insulation systems, HEGGEL has recently launched a new product, developed to meet the practical challenges of thermal protection, fire resistance, and humidity control across demanding environments.

This innovation defines the essence of **HEGGEL Therm 4410**.

Introducing HEGGEL Therm 4410

HEGGEL Therm 4410 is a two-component, waterborne acrylic insulation coating designed for modern industrial needs. It is the first release in HEGGEL's new generation of multifunctional insulation systems, built on our core expertise in protective coating technologies.

The heart of the system is aerogel, an ultralight, a porous solid composed of over 90% air. Known as one of the most effective thermal insulators available, aerogel enables **HEGGEL Therm 4410** to provide outstanding insulation, fire protection and safety at minimal thickness.

To further enhance safety and performance, the coating is fortified with encapsulated fire-retardant pigments, allowing it to withstand elevated temperatures and resist flame spread while maintaining coating integrity.

Why HEGGEL Therm 4410 Stands Out

HEGGEL Therm 4410 delivers a powerful combination of features that set it apart in real-world applications:

- Outstanding thermal insulation with aerogel-based microporous structure
- Safe-touch and fire-retardant finish for personnel protection
- Hydrophobic, resists moisture ingress and CUI
- Cures at ambient temperature, simplifying application on-site
- Compatible with a wide range of substrates including metal and concrete
- High insulation performance with minimal thickness and material usage
- Excellent resistance to UV, weathering, mold, and humidity
- Sound-dampening properties for improved acoustic comfort
- Breathable coating, allows controlled vapor diffusion to prevent blistering
- Environmentally safe, water-based, solvent-free, and non-toxic under fire exposure

Key Technical Highlights

With its advanced formulation and engineered performance, **HEGGEL Therm 4410** delivers measurable results across critical insulation and protection parameters. Below are the core technical characteristics that define its effectiveness and make it a reliable choice for demanding industrial environments:

Technical Data	Value	Unit
Thermal Conductivity	~ 46	mW/m·K
Density (Dry)	~ 0.3	g/cm³
Hardness	30 – 40	Shore A
Solids Content	~ 67	%
Water Vapor Transmission Rate	25	g/m².d
Sd-Value (At 8 mm DFT)	0.76	m

HEGGEL Therm 4410 offers a low thermal conductivity of ~46 mW/m·K, ensuring effective insulation with minimal thickness. Its dry density of ~0.3 g/cm³ keeps the system lightweight, while a Shore A hardness of 30–40 provides the right balance between flexibility and mechanical strength. With a water vapor transmission rate of 25 g/m².day and an Sd-value of 0.76 m (at 8 mm DFT), the coating offers controlled breathability, blocking external moisture ingress while allowing internal vapor to escape, thereby reducing the risk of blistering and corrosion.

Customizable Insulation System Designed for Your Conditions

In environments where the substrate is exposed to corrosive agents, or where long-term durability is critical, it is recommended to use **HEGGEL Pox** or **HEGGEL Coat** products beneath the **HEGGEL Therm 4410** insulation system. These base layers provide an additional barrier against chemical attack, oxidation, and moisture penetration, especially on bare steel or other reactive surfaces. When combined, the system ensures not only effective thermal insulation and fire protection but also robust corrosion resistance, offering comprehensive surface protection for harsh industrial conditions.

To complete the system, **HEGGEL Therm 4410** can be applied as a dedicated topcoat. This layer improves overall surface smoothness and significantly increases impermeability and durability, further extending the protective performance and service life of the insulation system.

Repairable. Inspectable. Efficient!

HEGGEL Therm 4410 is engineered for easy maintenance and long-term reliability. Coated surfaces can be inspected visually, recoated without full removal, and repaired locally without specialized equipment. It eliminates the need for cladding or insulation removal during routine checks, a major advantage in critical or confined installations.

With lower lifecycle costs, reduced installation time, and minimal downtime, **HEGGEL Therm 4410** supports both operational efficiency and long-term asset protection.

Application Areas

HEGGEL Therm 4410 is engineered for real-world conditions, offering versatile insulation across the following applications:

- Exterior application on storage tanks, process vessels, and pipelines
- Structural steelwork, industrial metal, and concrete surfaces
- HVAC systems, utility rooms, corridors, and stairways
- Energy-saving insulation for building interiors and exteriors (walls, ceilings, roofs)
- Cold storage and refrigeration units (walls, ceilings, containers)
- Fire-safe coating for indoor and industrial use
- Thermal insulation for hot and cold services

Built for the Challenges Ahead

As industrial systems evolve, so must the materials that protect them. **HEGGEL Therm 4410** brings together the science of aerogel insulation, the practicality of spray application, and the durability of fire and moisture-resistant chemistry, all in a single, high-performance system. It reduces thermal losses, mitigates corrosion risks, ensures surface safety, and simplifies maintenance, without the bulk or complexity of traditional insulation.

From design to operation, it empowers engineers and asset owners to meet today's thermal challenges with confidence and precision.

Let's Talk About Smarter Insulation

Whether you are upgrading aging systems, insulating sensitive equipment, or specifying new builds, **HEGGEL Therm 4410** offers a cleaner, smarter, and more efficient path forward.

Our technical team is available to support you at every stage, from design to field application. Click here to contact our team and let us help you build the right insulation solution for your project.

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