SPOTLIGHT

Easy to apply, touch-safe, and eco-friendly new Evonik's TEGO® Therm range to enhance the performance against CUI

Interview with **Dr. Niko Haberkorn**,
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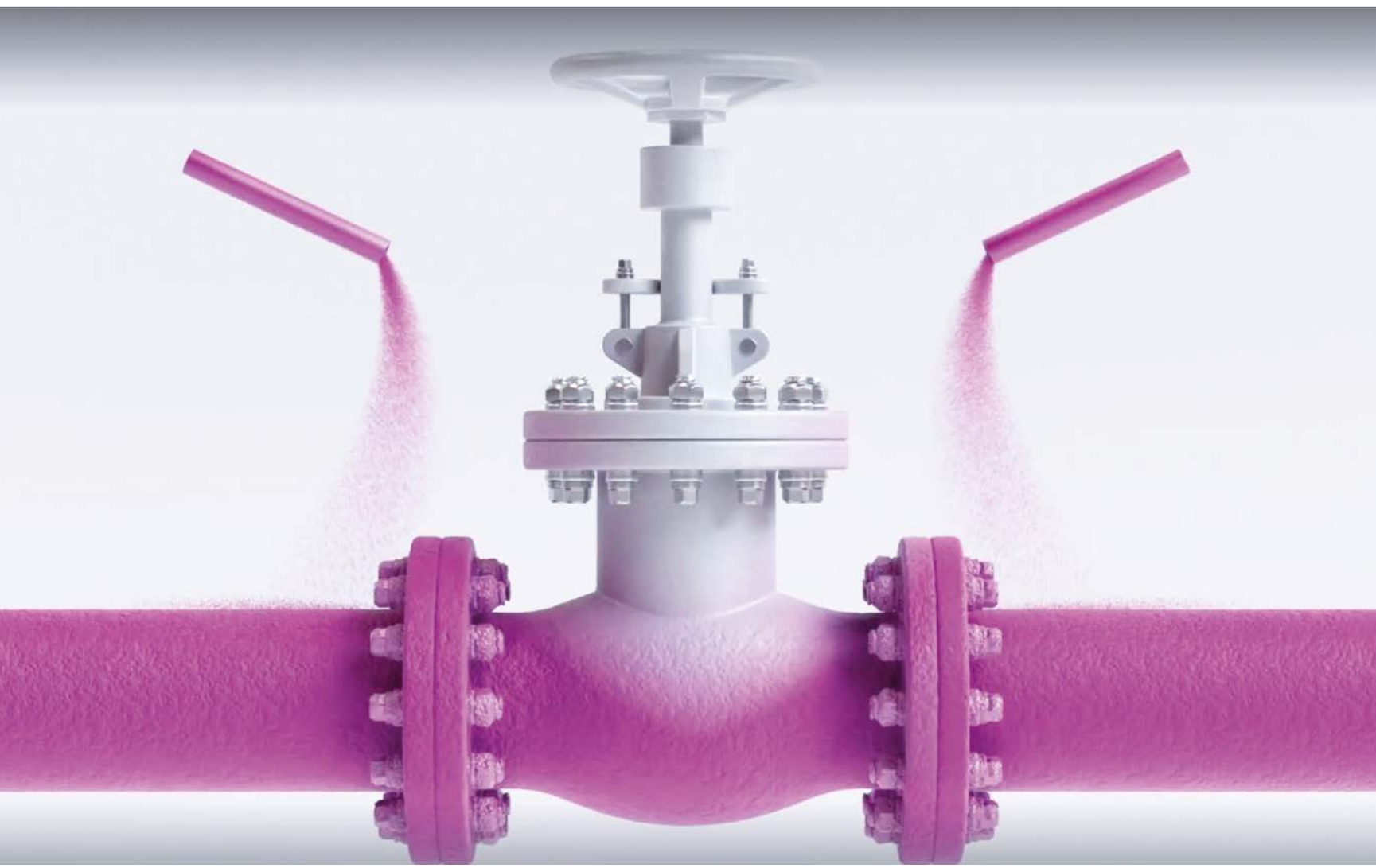


The Coating Additives business line at Evonik has introduced a new series of high-performance granules and a heat-resistant binder specifically designed for thermal insulation coatings under the TEGO® Therm product range. When combined with a suitable primer, they provide improved corrosion protection and are effective in preventing corrosion under insulation (CUI) on metal structures. Alessia Venturi, Editor in Chief of Corrosion Protection Magazine, interviewed Niko Haberkorn, Global Head of Business Development Industrial & Transportation Coatings at Evonik Coating Additives, to know future developments and potential applications of this new product range.

What are the requirements of the engineering, marine, and construction industries as far as thermal insulation is concerned?

In the engineering, marine and construction industries, thermal insulation must meet several critical requirements to ensure operational efficiency, durability, and safety. For chemical processing facilities, oil and gas operations, energy efficiency is essential. This involves minimizing energy losses in high and low temperature processes, which in turn reduces CO_2 emissions and supports the sustainability of industrial processes while reducing energy costs. Thermal insulation systems should be easy to apply to keep maintenance costs low. This includes the ability to apply insulation without the need for shutdown and the ability to apply complex three-dimensional shapes, possibly by spray application. Another key factor is durability. Thermal insulation must be able to withstand extreme weather and temperature conditions over a long service life, maintain its effectiveness, and prevent moisture ingress that can lead to corrosion under insulation (CUI). And let's not forget occupational safety as another important aspect of thermal insulation. Surfaces exposed to both extreme hot and cold temperatures, such as piping or vessels in industrial plants, must be adequately insulated to prevent unintentional contact injuries to workers. Moreover, it is essential that insulation materials utilized in the industrial, marine, and construction sectors possess fire-resistant and non-combustible properties to inhibit flame propagation and preserve structural integrity.

Can you please present Evonik's TEGO® Therm product range?

Evonik's TEGO® Therm range is a set of products designed to improve the performance of thermal insulation coatings (TICs). The range includes two types of microporous silica-based granules, TEGO® Therm HPG 4000 and TEGO® Therm HPG 6806, and a heat-resistant silicone-based binder, TEGO® Therm L 300. The granules feature a microporous structure, optimized density and superior hydrophobicity, all of which contribute to provide excellent insulating properties in coating formulations. In combination with the binder TEGO® Therm L 300, these granules enable high filler incorporation, robust adhesion to various substrates and long-term mechanical stability even at temperatures up to 250°C. Incorporating TEGO® Therm products into coatings allows to significantly reduce energy loss and make hot surfaces touch-safe, promoting a safer work environment. In addition, these coatings are user-friendly and can be easily applied to complex shapes, providing a more practical solution than traditional insulation methods such as mineral wool.

What are the corrosion protection performances of TEGO® Therm?

TEGO® Therm thermal insulation coatings, when combined with a suitable primer, provide improved corrosion protection and are effective

in preventing corrosion under insulation (CUI) on metal structures such as pipelines, vessels and other equipment. These coatings differ from conventional insulation systems, such as mineral wool, in that they help minimize the risk of CUI by preventing condensation. They maintain the surface temperature of the coating above the dew point, which helps prevent moisture buildup. In addition, the strong bond between the coating and the primer layer acts as a barrier, preventing moisture from penetrating and reaching the underlying metal surface, providing additional protection against corrosion.

Let's talk about sustainability: what are the sustainability benefits of TEGO® Therm?

Our TEGO® Therm coatings contribute to sustainability in several key ways. Firstly, they are waterborne, which means they have a low volatile organic compound (VOC) content. This is beneficial because it reduces the need for harmful solvents that can contribute to air pollution and have a negative impact on the environment. Moreover, the insulating properties of TEGO® Therm coatings lead to a decrease in energy consumption. By providing effective insulation, these coatings minimize heat loss from equipment and piping, which in turn reduces the amount of energy required to maintain desired temperatures. This energy efficiency translates into lower greenhouse gas emissions, as less fuel is burned to produce the necessary energy.

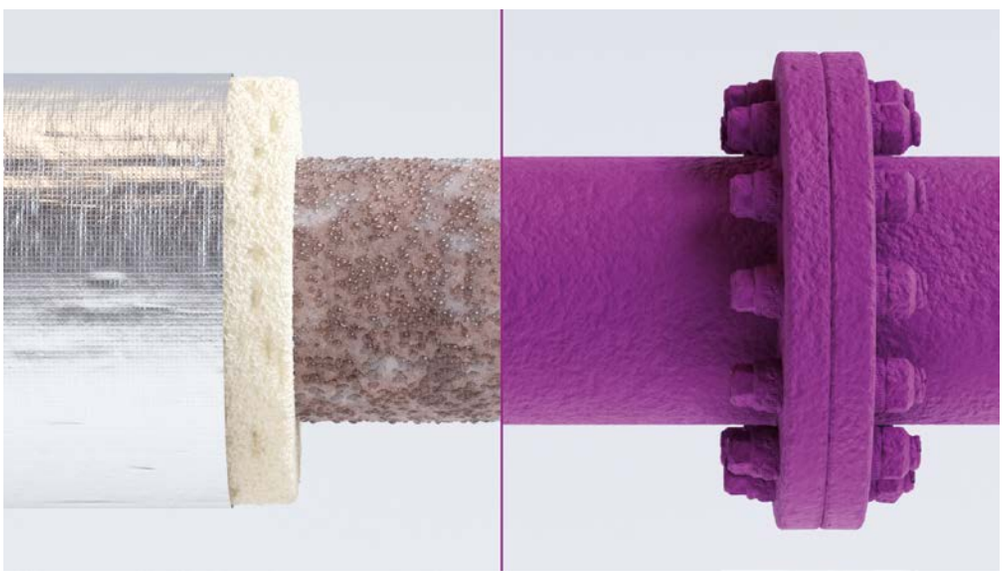
Evonik's Life-Cycle Management team has conducted studies to quantify these energy savings in practical applications. The findings suggest that by using TEGO® Therm coatings on areas that are typically not insulated with traditional methods, such as valves and complex piping, there can be a substantial reduction in energy loss. The result is a significant decrease in greenhouse gas emissions, which underscores the coatings' contribution to environmental protection.

In summary, our TEGO® Therm toolbox offers solution for the formulation of long-lasting and effective insulation coatings, enabling a reduction in energy use and greenhouse gas emissions, and thus supporting global sustainability efforts.

The focus of the corrosion protection market is currently on ease of application, reduced curing time, reduced maintenance: what TEGO® Therm can offer to these respects?

Our TEGO® Therm range and its application in insulation coatings effectively supplements corrosion protection requirements, emphasizing ease of application, prevention of condensation and CUI, and therefore reduced maintenance needs. Thermal insulation coatings (TICs) based on TEGO Therm have been successfully implemented in a variety of applications across Evonik's global production sites. With their low thermal conductivity and robust structural integrity, TEGO® Therm-based coatings are suitable for diverse applications, both indoors and outdoors.

The coatings are engineered to ensure touch safety, enhance energy efficiency, and prevent CUI. They are highly versatile and can be applied swiftly and effortlessly, even on complex surfaces. This streamlines the insulation process, cutting down on the time and effort typically required for application and significantly reducing the need for extensive maintenance. The result is a product that not only protects but also contributes to operational efficiency and longevity of the equipment it covers.



Scan the QR Codes to learn more about new TEGO® Therm product range

Guiding Formulation for waterborne Thermal Insulation Coating

Peak temperature	150 °C	200 °C	250 °C
TYPE OF COATING	ACRYLIC	ACRYLIC + SILICONE	SILICONE
DRYING/CURING MECHANISM	AMBIENT DRYING	AMBIENT DRYING AND CURING AT HIGHER TEMPERATURES	
TEGO® Therm L 300	–	40	50
Acrylic Resin	60	20	10
Polyvinyl alcohol sol., 20 % in demin. water	12	12	12
Water, demineralized	3	3	3
TEGO® Therm HPG 4000	15	15	15
TEGO® Therm HPG 6806	10	10	10
Total	**100**	**100**	**100**

Main technical characteristics of the TEGO® Therm product range

Insulation Coatings based on TEGO® Therm components are easy to apply to all kinds of complex geometric shapes by time-saving spray application. The super insulation TEGO® Therm granules provide an outstanding low thermal conductivity characteristic, which significantly reduces the loss of energy. The coating also ensures personnel protection by reducing the surface temperature to an acceptable limit.

TEGO® Therm HPG 4000 are silica-based granules with superior low thermal conductivity, high hydrophobicity and reduced flammability:

- Particle size d50 ~300 µm
- Superinsulation properties
- High hydrophobicity.

TEGO® Therm HPG 6806 is a finer powder which also provides excellent insulation functionality, enhances mechanical performance and features smooth & even surfaces of insulation coating:

- Particle size d50 ~30 µm
- Excellent insulation properties
- Less thickening and easy incorporation in coatings.

TEGO® Therm L 300 is a liquid waterborne silicone hybrid binder with excellent heat & mechanical stability:

- Liquid binder with solid content ≈50%
- Broad compatibility with acrylic emulsions
- Ambient film forming.