

OPTIMAL THERMAL EFFICIENCY

Thermal Insulation Systems

Armacell's Thermal Insulation Systems are flexible and durable. Offering effective mitigation of corrosion under insulation complemented by optimal thermal efficiency, it's ideal for oil and gas, petrochemical and power plant applications with temperatures from -200°C to $+650^{\circ}\text{C}$.

www.armacell.com/energy



 **armacell**[®]
MAKING A DIFFERENCE AROUND THE WORLD

THERMAL EFFICIENCY AND MITIGATION OF CUI

Armacell Thermal Insulation Systems

FOR
TEMPERATURES FROM

-200 °C to
+650 °C

(-328°F - 1200°F)

With its benchmark product features and flexibility, our thermal insulation systems are the ideal choice for use in the oil and gas industry. Save energy and minimise the risk of corrosion under insulation (CUI). Benefit from easy handling and shipment. Reduce total installed time and drive savings. Plus, achieve optimal thermal performance in lightweight, reduced-thickness industrial insulation systems.

ArmaFlex®



ArmaGel

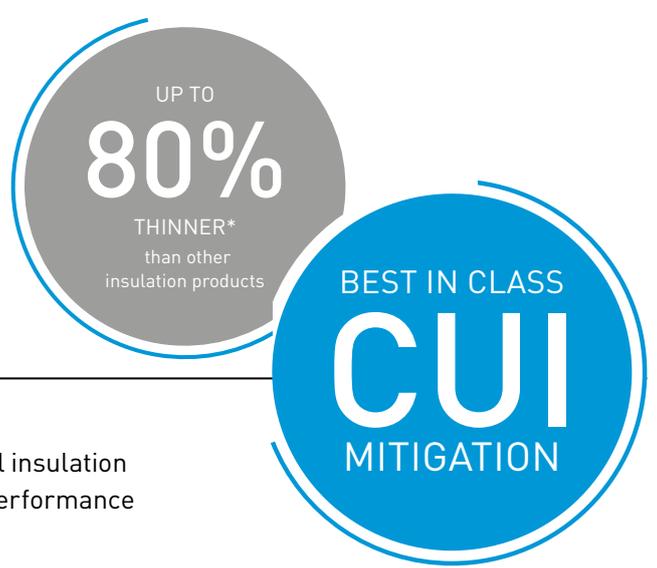


Great thermal performance that maintains system integrity.

ARMACELL THERMAL INSULATION SYSTEMS

Armacell Energy has designed multiple thermal insulation systems for the oil and gas, petrochemical and power plants markets. Working with various materials, the multi-layer design is aimed at achieving an optimal balance of thermal performance, protection against water vapour ingress and reduced weight and thickness. Our customers can rely on durable, cost- and energy-efficient insulation systems, which at the same time mitigate CUI.





FEATURES & BENEFITS

While each of the individual insulation materials used in our thermal insulation systems comes with its own set of features and benefits, superior performance is achieved when optimally engineered together.

We innovate and focus on materials and systems that deliver superior performance.

// Designed to deliver

We have developed a dedicated range of industrial materials meeting the demanding requirements of the oil and gas, petrochemical and power plant sectors.

// Lifetime performance

Resistance to water and water vapour ingress, plus an optimal system design that delivers long-term predictable thermal and acoustic stability and enhanced process performance.

// Two in one

Our insulation materials combine thermal and acoustic performance and can also be engineered with traditional insulation materials for specific demands.

// Optimal thermal performance

Fewer joints and seams with closer fitting to complex parts and protrusions than rigid materials, making the actual heat loss/gain of ArmaFlex/ArmaGel considerably better than that of rigid materials.

// Resistant to damage

Flexible materials that do not crack, break or crumble and are resistant to vibration and mechanical abuse.

// Integrated vapour barrier

ArmaFlex and the Arma-Chek®

covering systems are flexible and resilient to both water and water vapour ingress.

// Training and technical support

Our team of technical experts support operators, engineers and contractors in optimising the value gained from using our insulation systems. We can offer a reliable technical service at every stage of your project.

Flexible, thinner and lighter systems. Easy maintenance. Connecting your business with lower lifecycle costs.

// Reduce space and weight

Lightweight and up to 40% reduced thickness for improved space efficiency and a smaller plant footprint, reduced supporting steel work and weight. Less cladding materials are required with lower installation costs.

// Straightforward installation

Our flexible insulation materials are easy and quick to install and fabricate, leading to reduced installation time and costs. They also fit better reducing rework and wastage.

// Reduce cost, increase ROI

Heat loss can be reduced up to 20 times on high temperature applications. This means a fast payback and reduced operating costs.

// Easy inspection and maintenance

Simple methods and non-destructive inspection can save time and money.

// Supply chain benefits

Materials can be pre-fabricated at the jobsite, unlike traditional systems and materials, leading to reduced SKUs and inventory for both projects and ongoing operations.

Mitigate the spread of corrosion under insulation. Best-in-class noise reduction.

// Reduce the risk of CUI

Our closed-cell ArmaFlex and hydrophobic ArmaGel insulation materials are proven to reduce the onset and spread of CUI.

// Prevent moisture ingress

We select our materials and design our systems to create a tortuous path for water - this minimises the risk of it travelling from the outside of the pipe to the surface, reducing the risks of CUI.

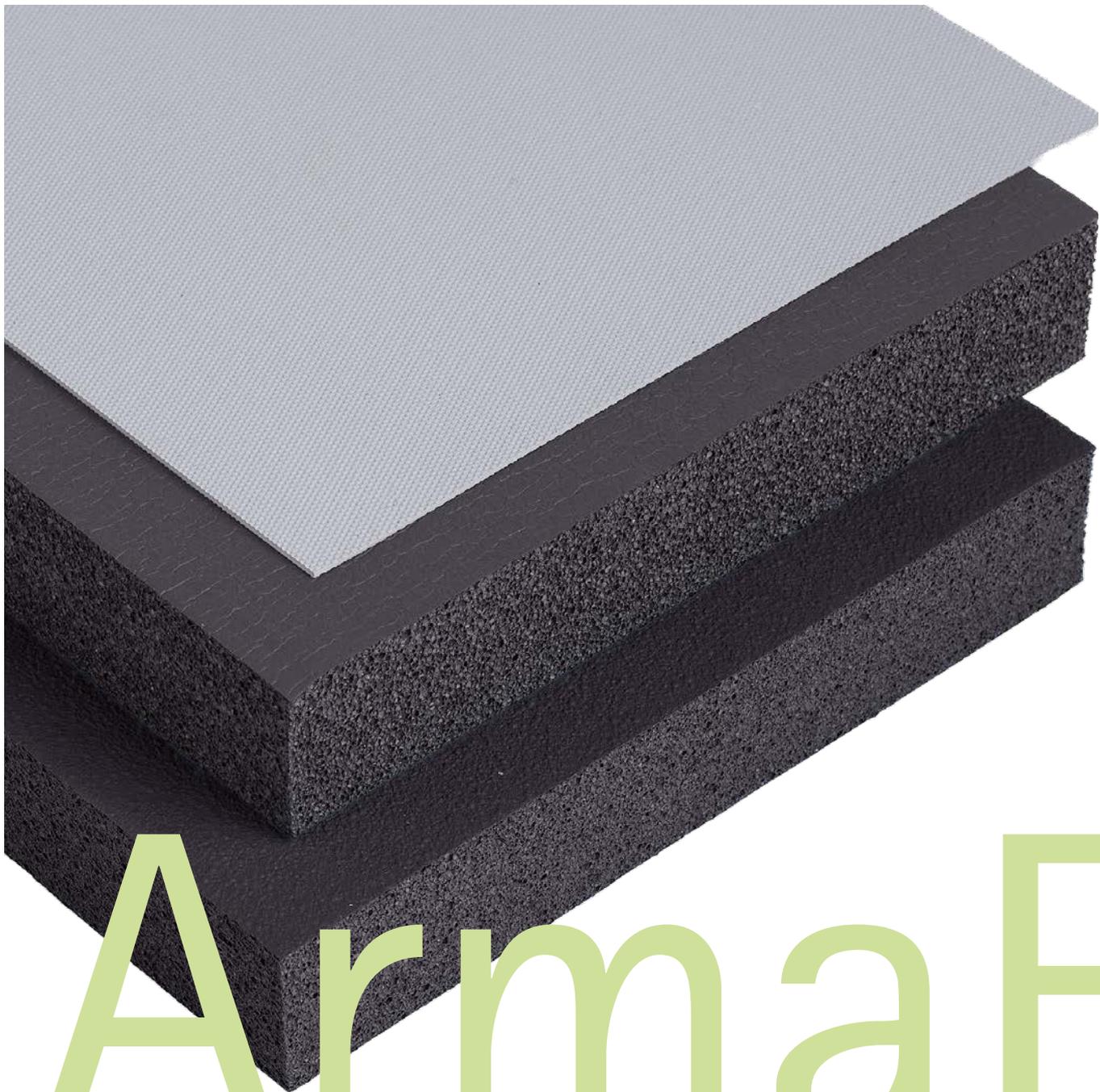
// Reduce the risk of water trapped at the pipe surface

Flexible materials and application techniques means a better fit around complex parts and no voids between insulation and pipe where water could otherwise collect with rigid or less flexible materials.

// Eliminate the risk of galvanic corrosion

Systems qualified with non-metallic jacketing eliminates the opportunity for galvanic corrosion.

* Based on comparison of ArmaGel and Expanded Perlite with the same thermal performance at 300 °C operating temperature, installed on a 6 inch pipe.



ArmaFI

ArmaFlex is Armacell's product heritage. Today, in its 7th product generation, this flexible, light-weight, high-tech material features an insulating closed-cell structure with low thermal conductivity and an in-built vapour-barrier. Recognised as easy to install, it's the right fit for installers. Complemented by superior performance to mitigate CUI, tested and confirmed by the recognised institutes TNO/Endures and InnCoa.

"The closed-cell materials [e.g. flexible elastomeric foams and cellular glass] can provide a more effective barrier to water ingress than open-cell insulation materials [e.g. mineral wool and calcium silicate]."

Mr. S. Winnik; Corrosion Under Insulation Guidelines (2008)



ARMAFLEX. PROVEN PERFORMANCE.

With a proven track record in the oil and gas industry of over 20 years, ArmaFlex systems have been applied on projects as diverse as Floating Production Storage Offloading (FPSO) vessels, Ammonia and Ethylene plants, plus LNG liquefaction plants.



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YOUR BENEFITS WITH ARMAFLEX

The high-tech, benchmark-setting flexible insulation foam known as ArmaFlex offers a multitude of benefits.

// Continuous sealed technology
ArmaFlex is installed as a gap-free, continuous insulation system with tightly sealed joints around protrusions and supports. This reduces the risk of water and water vapour ingress and thermal bridging of the insulation system and ensures consistent thermal performance.

// Damage and impact resistance
ArmaFlex is strong and highly resistant to impact, with higher density and mechanical performance, demanded by industrial environments. When used in combination with our flexible Arma-Chek R covering, risk of material compression and loss of thermal performance of the system is highly reduced.

// Long-term thermal performance and best in class CUI mitigation
The closed-cell structure of ArmaFlex ensures strong resistance to water absorption, as well as to water vapour transmission, resulting in a stable thermal conductivity over time and best-in-class CUI mitigation*.

*According to results of tests conducted by InnCoa and TNO/Endures, assessing mitigation of corrosion under insulation.

Our vision has always been to create innovative, technical insulation solutions and components to conserve energy and make a difference around the world. With aerogel that vision is now a reality.

SAY HELLO TO THE FUTURE TODAY. ARMAGEL. INSULATION JUST GOT BETTER.

Welcome to the next generation of aerogel blanket technology. Flexible, ultra-thin and ultra-light. Environmentally safe. Superior thermal performance. Low thermal conductivity. ArmaGel HT is the reliable solution for high-temperature applications up to 650 °C (1200 °F).

AVAILABLE IN

**5,10,15,20
MM**

INSULATION THICKNESS

Ar

ARMAGEL. STRONG. LIGHT. EFFICIENT.

Aerogel is a solid derived from gel in which the liquid component of the gel has been replaced with air making it dry and porous. In fact, over 90% of the volume is empty space making aerogel the world's lightest solid material.



ArmaGel HT is compliant to the ASTM C1728 aerogel standard and meets the ASTM C177 thermal conductivity requirements.



YOUR BENEFITS WITH ARMAGEL

// Superior thermal performance, minimised space and weight

ArmaGel insulation systems are up to 80% thinner than other insulation systems, along with significant weight, cladding, pipe spacing and plant footprint reductions.

// Reduce time and cost

Cuts easily and conforms to complex shapes, with less wastage, making it the right fit for installers. Plus, product removal and replacement is made simple, reducing downtime.

// Hydrophobic and breathable

Repels liquid water, but allows vapour to escape, helping to keep your equipment drier for longer. This results in enhanced mitigation against CUI.

maGel

// Armacell Energy | Head Office
London • United Kingdom

// Phone
+44 330 880 4040 [Office hours: 9:00 - 17:00 UK]

// Email
General enquiries oilandgas@armacell.com
Technical enquiries technical.oilandgas@armacell.com

All data and technical information are based on results achieved under the specific conditions defined according to the testing standards referenced. It is the customer's responsibility to verify if the product is suitable for the intended application. The responsibility for professional and correct installation and compliance with relevant regulations and project specification lies with the customer. Armacell takes every precaution to ensure the accuracy of the data provided in this document and all statements, technical information and recommendations contained within are believed to be correct at the time of publication. By ordering/receiving product you accept the **Armacell General Terms and Conditions of Sale** applicable in the region. Please request a copy if you have not received these.

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ABOUT ARMACELL

As the inventors of flexible foam for equipment insulation and a leading provider of engineered foams, Armacell develops innovative and safe thermal, acoustic and mechanical solutions that create sustainable value for its customers. Armacell's products significantly contribute to global energy efficiency making a difference around the world every day. With 3,100 employees and 24 production plants in 16 countries, the company operates two main businesses, Advanced Insulation and Engineered Foams. Armacell focuses on insulation materials for technical equipment, high-performance foams for high-tech and lightweight applications and next generation aerogel blanket technology.

For more information, please visit:
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