

# industry

**Insulation for low temperature applications  
with high-performance PUR rigid foam.**



**puren**<sup>®</sup>  
gmbh

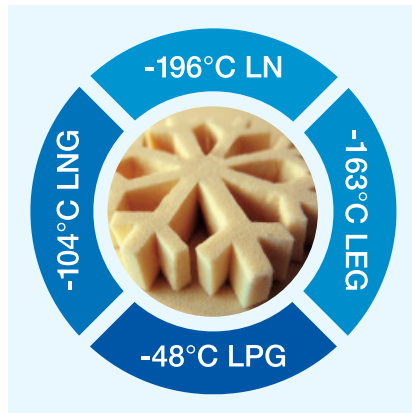
*PURe technology!*



## High-performance PUR rigid foam technology

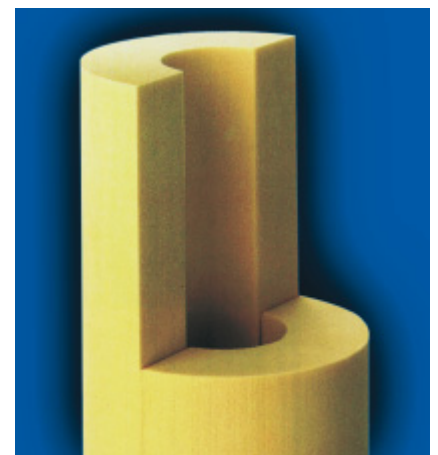
industry

**puren makes it  
easy to manage  
extremely low  
temperatures**



puren is demonstrably one of the most innovative companies in the area of high-performance PUR technology. Using our superb levels of technical expertise we develop and produce first-class quality polyurethane rigid foam products from raw materials supplied by Bayer Material Science AG in order to fulfil high-level special requirements within industry. As an internationally-active PUR manufacturer, puren has been a reliable partner for international companies in the area of industrial, tank and pipeline construction for many years. Further large-scale customers include docks and the aeronautical industry.

puren offers high-quality insulating materials for further processing to fulfil special requirements within shipbuilding, in particular for insulation of gas tankers.



*Wherever extremely cold media have to be transported through pipelines (here deck pipelines on board an LNG tanker), high-performance PUR insulating materials offer a first-class system solution.*

# Reliable low-temperature performance with puren



**puren offers improved cost-effectiveness, more load space and better conservation of valuable resources.**

Design and construction of cryogenic insulating systems such as for example LPG/LEG/LNG tanks or pipelines require special know-how and a great deal of experience. Modern insulation systems are characterised by safe storage, low evaporation loss and lowest-possible energy consumption during reliquification. In addition to the technical design, the choice of materials used also plays an important part. Even with low material thicknesses, low-temperature polyurethane insulation materials exhibit first-class insulation and are economical to process as shaped sections or panels. PUR insulation materials allow thinner layers to be used than with other less favourable materials, while still achieving the same insulating effect. This means greater loading capacity is available, while the insulating material remains lightweight.

**Strong product characteristics for exceptional requirements.**

Low-temperature polyurethane rigid foam is an ideal construction material for applications involving extremes of cold. The material, with mainly closed cells, has good hydrophobic properties and also exhibits extremely low heat conductivity. Particularly for use at temperatures down to  $-196^{\circ}\text{C}$ , puren offers extremely high-performance products which are all characterised by superb low temperature performance.



# High cost-effectiveness with puren



## A safe decision for the best technical solution.

puren insulating construction materials have a long lifetime and are robust and easy to work with. Only high-quality insulation materials can be used in the "low temperature sector". puren stands for assured quality and supplies insulating materials which completely fulfil the relevant international specifications.

Sheets, panels and shaped sections from puren rigid foam blocks therefore cover a wide range of applications, extending from cold insulation for tanks and pipelines down to shipbuilding. Substances such as Liquid Petrol Gas, Liquid Natural Gas or Ethylene set particular challenges during transport and storage.

In comparison with other insulating materials, PUR offers decisive benefits:

- higher loading capacity through thinner insulation layer
- easy, low-cost processing with an extremely high degree of precision
- simple production of shaped parts
- complex shapes also possible
- long lifetime, can be recycled
- extremely robust and wear-resistant
- reliable, long-term insulation with comparatively low material thickness
- excellent stability combined with low weight
- mechanical strength
- low water absorption



*Extremes of temperature and rapid temperature changes are to be found in the European wind tunnel (-196°C). The construction materials of puren used here demonstrate their superb temperature insulation properties.*



## High strength and high performance – puren comes into its own

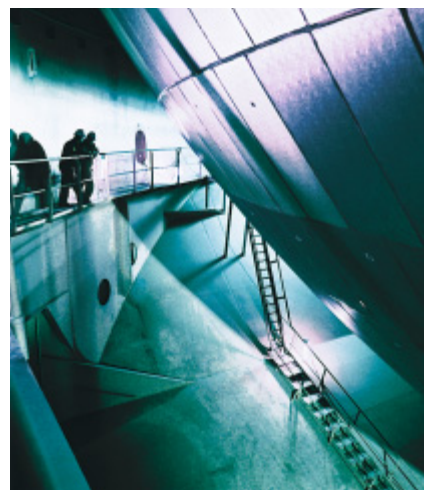
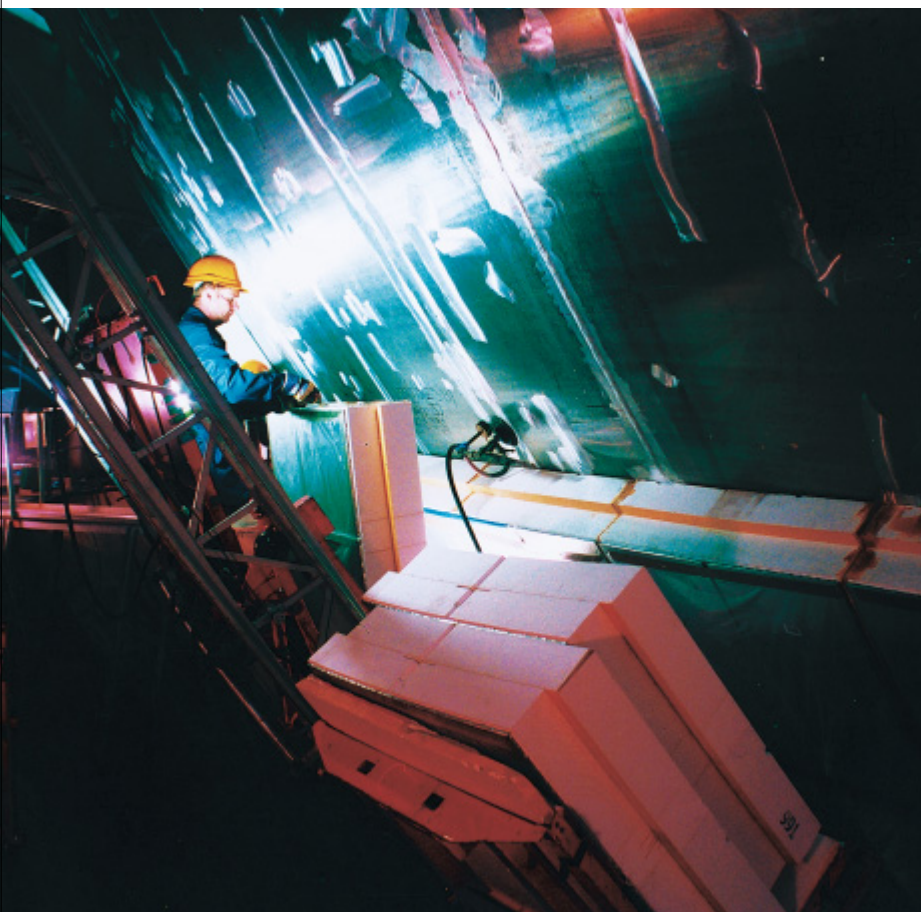
Low temperatures are one thing – mechanical strength quite another. And when transporting liquid natural gas (LNG) it is necessary to have both, for the dynamic loads caused by movement during shipping must not be underestimated. In addition to the obvious movement of the tanker, thermal contraction and the geometry of the tanks have to be taken into consideration. PUR insulating materials combine low intrinsic weight with extreme strength, enormous stability and reliable insulating properties. They therefore create the best possible conditions in order to achieve low U values and to reliably

fulfil the specified "boil-off" rates. Low-temperature products of puren are therefore extremely suitable as system components in tank construction. A further advantage is the fact that the PUR panels or shaped sections are easy to process and work with. In cooperation with fixing technology (e.g. polycarbonate bolts or adhesives) and possible top layers of metal, PUR offers the possibility of perfect composite materials.

### **Top technology for optimum solutions in the low-temperature sector.**

With its high-performance specialist products, puren offers manufacturing companies a reliable and economical basis in order to store and transport

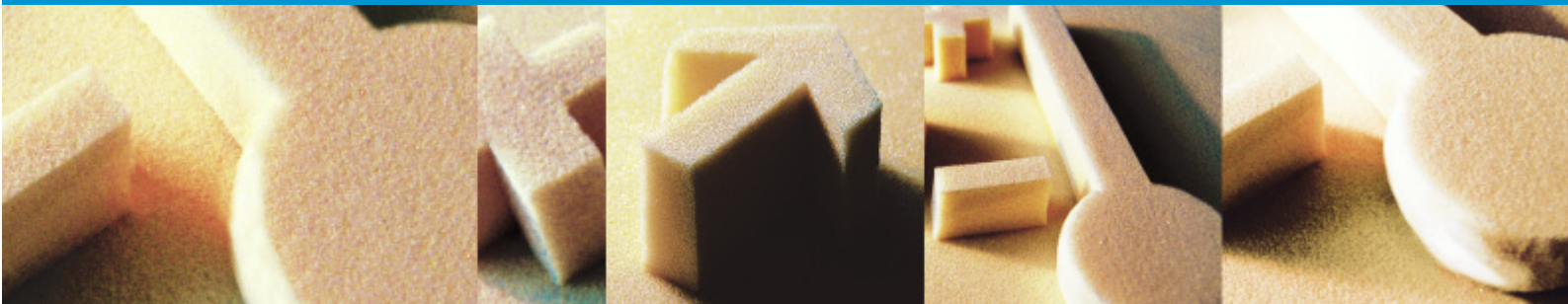
critical substances such as Liquid Petrol Gas, Liquid Natural Gas or Ethylene reliably and safely. puren high-performance and construction insulating materials fulfil the most stringent requirements the world over. Independent, internationally-recognised institutes frequently inspect puren products. In combination with strict factory controls, this ensures consistent product quality. First-class references speak for puren – so speak to us first!



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