

Industry



Performance prevails
purenit – the smart construction
material second to none

purenit[®]
made by puren[®]

PURe technology!



purenit – a diamond among smart materials

Industry

purenit[®]
made by puren[®]



purenit – what's it all about?

The answer is quite simple: purenit is a high-density smart material combining an incredulous multitude of outstanding properties. purenit performance data can be termed brilliant without any qualification. purenit is a polyurethane product on a (PUR/PIR) rigid foam basis providing a high thermal insulation value. Its bulk density ranges around 550 kg/m³ – and this makes purenit a genuine light-weight – despite all its rigidity, stability and high thermal insulation value.

PURENIT'S TOUGH PROPERTIES

| | |
|--------------------------------|--|
| Reaction to fire | normally inflammable, Class E/D-s3, dO (DIN EN 13501-1), B2 (DIN 4102), BKZ 5.3 |
| Thermal conductivity | $\lambda \leq 0,087^*$ (EN 12667) or 0,096 (DIN 4108-4) W/(mk) usable in temperature range -50°C to +100°C, short term +250°C |
| Bulk density | 550 kg/m ³ |
| Compressive strength | according to DIN EN 826 7,1 MPa |
| Resistance to aging | non-rotting, mould- and mildew-resistant |
| Resistance to chemicals | mineral oils, solvents, dilute solutions and acids |

* Laboratory value

purenit – the incredible smart material!

If you intend to point the way by means of performance, you need a reliable basis to safely realize your own ideas and developments. New ways frequently require also new materials and their combination. However, what do you do, if traditional materials have reached their limits? If wood, metal, plastics or any other composite material do not meet your very special requirements? This is the point where purenit comes in – the innovative construction material that simply offers more possibilities!

Brand quality from one source. purenit is a brand product.

Remainders from the polyurethane manufacture of puren's are integrated into purenit – however, and this makes for the difference, no waste materials are being used for its production. Homogenous only and free of foreign substances is the motto. Therefore, all substances used in production are being strictly tested. purenit's very special properties are based on highly developed recipes of puren. And for this very reason, all substances and materials from basic raw materials up to finished purenit are directly processed by puren.

purenit – sustainability in perfection.

To assess how sustainable and ecological a material really is, the complete life cycle of a product from manufacture via usage up to disposal or reuse must be considered. purenit is a product setting the pace in this direction, being an excellent example for the objective target of sustainability set by puren gmbh.



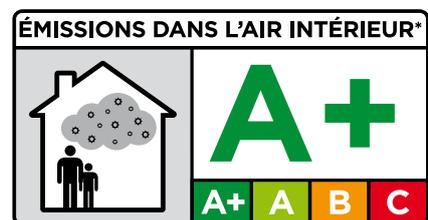
purenit is harmless from a biological and building ecology point of view. purenit is resistant to aging, rot-proof and non putrescible.



The EPD (Environmental Product Declaration) for polyurethane insulating panels explicitly refers to the manufacture of high-grade materials on polyurethane basis.



purenit complies with strict requirements – as numerous national and international independent test certificates prove (e.g. DGNB, LEED, DIBT, FIW, BAM).





purenit – more qualifications, higher performance, better advantages

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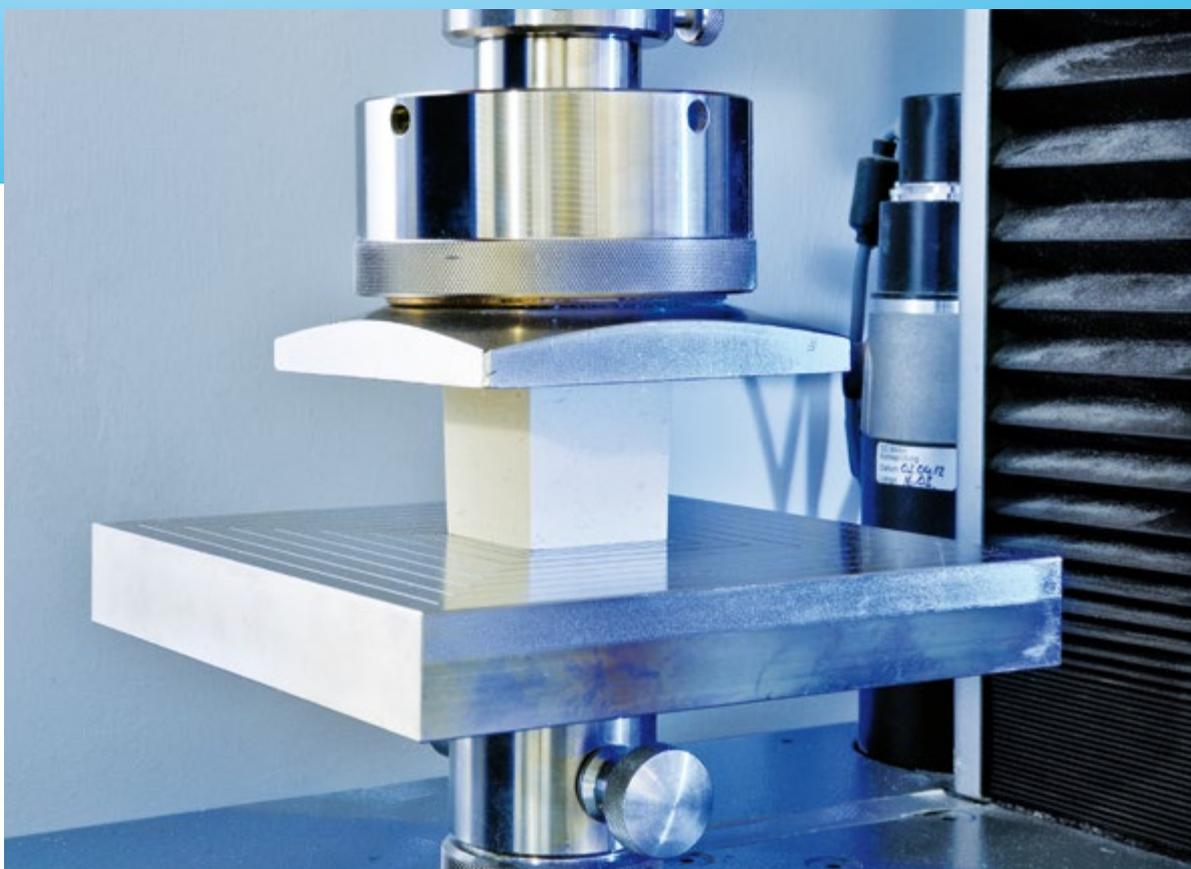
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Highest demands? Then you're exactly right with purenit.

Sophisticated new solutions not only require innovative ideas but also materials providing a reliable basis for new approaches to solutions where product performance is concerned. purenit as high-performance smart material is a material whose range of application basically expands every day. Many processors of purenit ask themselves: „Whatever did we do before purenit was available? purenit's unique performance is no accident.

Takes a lot, has a thick skins and lasts and lasts and lasts...

Extensive tests attest excellent mechanical properties to purenit. The material is extremely resistant to pressure as the value of 7,1 Mpas (EN 826) confirms. Therefore, purenit is highly suitable as building component or as core material of sandwich elements. Being so resistant to pressure, it is also suitable for safe connections and applications in the installation sector.



purenit is extremely pressure-resistant as its technical properties confirm. purenit is highly suitable for building components or as core material of sandwich constructions.

Hot, cold, wet or moist? purenit is a genuine wonder material.

Being a diffusion-open smart material, purenit excels with outstanding climatic properties. Under strain from moisture, purenit shows its extraordinary performance and distinguishes itself clearly from wooden materials. Even extreme moisture will not result in a change of shape – not even under long-term strain. Its rather low μ -value of 8-12 positively supports water vapor permeability. Water absorbed is being harmlessly released. Another advantage: purenit is non-rotting, mold- and mildew-resistant and even resistant against termites – i.e. absolutely predestined for the manufacture of building components and installation work.

Unnerves physicists: purenit's thermal behavior.

As duroplastic insulation material, purenit convinces with its enormous thermal capacity, resisting short-term temperatures from -50°C up to $+250^{\circ}\text{C}$. The thermal conductivity is around 0.087 (EN 12667) or 0.096 (DIN 4108-4) W/(mk). Naturally, purenit is an insulation material approved by the building authorities and complies – also in its reaction to fire – with valid standards. Its extremely low thermal expansion coefficient of 5 mm at 100K over a length of 1 m greatly facilitates any combination with other materials.

purenit resists acids, solutions, solvents and other substances.

purenit's expansive resistance to most chemicals and solvents, dilute solutions and acids opens an enormous range of applications. Today, trend-setting composite materials are mostly laminated or bonded. Like hardly any other material, purenit works well with adhesives and laminate materials. Even without lamination, purenit proves its longevity in critical and difficult application areas such as in agriculture, in particular for animal husbandry. Here, too, purenit sets standards and meets highest requirements.



Moisture has an extreme impact on many materials. purenit even retains its shape in boiling water.



purenit also resists liquid nitrogen.



Solutions, solvents, agents – purenit resists a multitude of popular chemicals and is also suitable for mineral-based plaster systems.



Just do whatever you want –
but best do it with purenit

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FACTS FOR PROCESSING

| | |
|-------------------|---|
| Milling | exact and without effort, on any commercial wood processing machinery |
| Drilling | an HSS drill bit suffices for drilling screw connections |
| Sawing | saws easily and precisely. Water-jet cutting also possible. For a longer stability, we recommend carbide tools. |
| Laminating | Practically no restrictions when joined and laminated with other materials. Ideal support for laminating materials. |
| Bonding | Suitable to process with any commercial adhesive/bonding system. |
| Painting | purenit even withstands solvent-based paints and varnishes. |

Simple and cost-efficient processing.

That purenit as smart material can take a lot is one fact, its nearly limitless variety of applications another. Here, one hears again and again: „Incredible!“ purenit can be processed easily on any current wood working machinery and tools – just as you’re used to from working with chipboards. Carbide tools will help. Reminders from processing may be given over

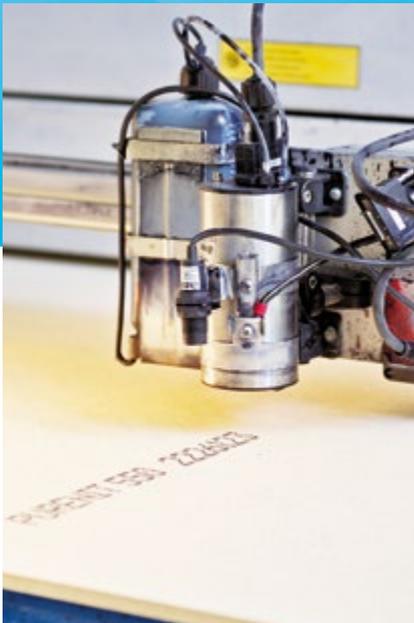
to regular thermal recycling. For screw connections, we recommend predrilling and leaving sufficient distance to the edges. During processing, purenit bis impressive in every aspect.

Bonding and laminating safely.

Ever frequently, glued connections are used to interconnect parts and components. purenit allows for nearly any known process. To achieve perfect bonding with

purenit, we recommend to determine the details with the manufacturer of the adhesive. purenit works extremely well with widely-used 1K- or 2K-PU adhesives, hotmelt or water-based adhesive systems.

No problems with paints or painting with popular products or systems that are solvent-based themselves. As with other materials, paint a test surface to achieve optimum paint results.





purenit – a brilliant smart material, offering a thousand possibilities

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The first all-rounder surpassing everything.

Famous companies rely on the smart material purenit and appreciate the many advantages of this special construction material.

To manufacturers of building elements, its resistance to moisture makes all the difference. In vehicle construction, it is its excellent behavior towards adhesives and the resulting multitude of surface laminates. For manufacturers of counter tops and floor elements, pressure resi-

stance and the possibility to use wood working machinery for processing are predominant. For manufacturers of lab furniture or agriculturally used products, its resistance to chemicals is the principal characteristic.

Wooden materials we had yesterday, today, it's purenit.

purenit performs better than other materials and its total properties are practically without competition. Its bulk density of 550 kg/m³ makes purenit a

lightweight among smart construction materials and thus contributes to reduce weight for the vehicle industry, i.e. a substantial advantage for commercial vehicles and campers. The homogeneous material structure of purenit furthermore provides excellent thermal insulation – it can hardly get any better!



Top photo: Whether sport boat, sail boat, private yacht or furniture inside cruise ships – for shipbuilders, purenit is always a wise choice.

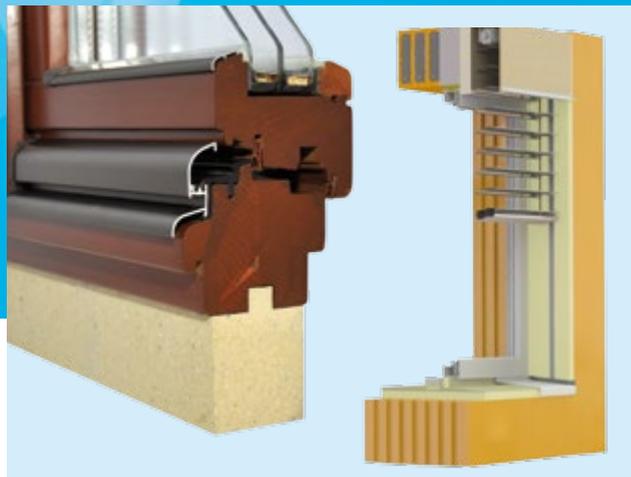
Photo below: 100 % waterproof flooring – below its high-grade cover layer, purenit convinces as support material.

High-grade interior design of spa areas and sanitary rooms – purenit allows creative room for planers and designers and convinces processors through easy handling.



**For some it's witchcraft –
for us it's purenit.**

An impartial comparison to wooden materials pays off. Because of its unique characteristics, purenit convinces point by point. Engineers, building and installation experts as well as product developers from various industries and sectors confirm time and again: purenit convinces not only on a technical basis but greatly inspires to develop new ideas. Thus, purenit creates room for genuine innovation.



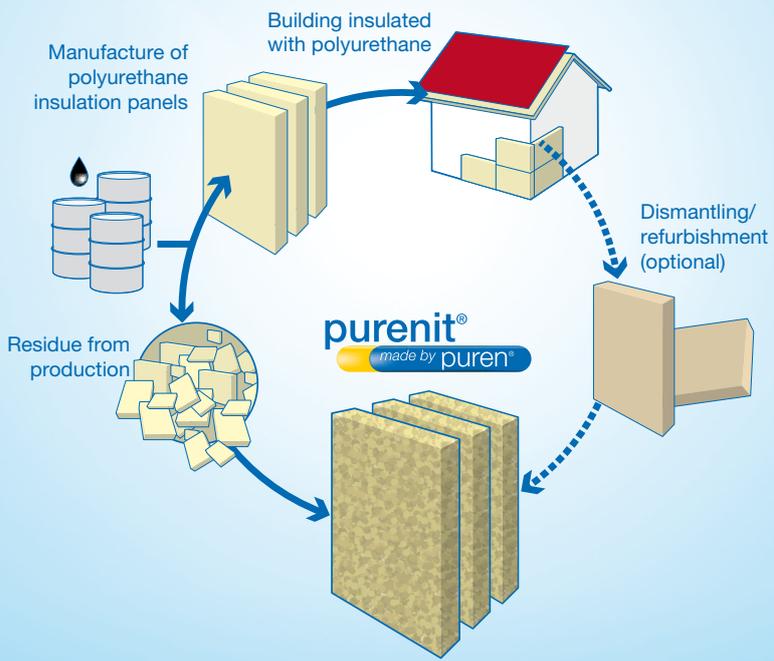
One of the greatest strong points of purenit: Building elements must meet enormous strains such as temperature gradients inside and out, moisture, heat and mechanical strain. Wherever purenit is used – this extraordinary material fulfills its claims. Whether in the vehicle, furniture or building components industry – purenit sets standards.





Unique world-wide: The purenit manufacturing cycle

Industry



World-wide unique: At puren, purenit is manufactured in a closed production cycle convincing by its sustainability. purenit is part of an exemplary product life cycle.

State-of-the-art manufacturing technology for purenit – quality is not an accident.

The requirements of the processing industry from a smart construction material such as purenit are tremendous.

ously high. Compliance with applicable and important standards necessitates constant product quality. During manufacture, purenit being a successful brand-name product is subject to strict and consistent internal and external supervision. The versatility of the purenit construction material in context with its outstanding material quality is only guaranteed, if all steps interlink perfectly during the production process. Without process reliability, no such high-performance product can be manufactured. All purenit products are being centrally manufactured in one of the most modern production plants in Europe.



In the idyllic valley of the Danube, a state-of-the-art plant is manufacturing our multi-purpose purenit material.



Manufacturing purenit – the reliable industrial production must fear no comparison.

100 % purenit – absolutely from one source.

puren gmbh is currently the only enterprise world-wide to manufacture a smart construction material such as purenit from raw material processing up to the finished smart material in a closed production cycle. For more than 40 years, puren is setting standards for the industrial manufacture of polyurethane rigid foam products. PUR/PIR insulating building materials shaped as insulating panels, foam slab stock and purenit are being manufactured in a basically endless recycling cycle.



PURENIT SMART MATERIAL

| | |
|---|--|
| Basic material | PUR/PIR rigid foam, non-laminated |
| Characteristics | high resistance to mechanical strain, pressure-resistant, dimensionally stable, easy to bond, to be coated and laminated with various cover layers, resistant to chemicals, harmless from a biological and building ecology point of view, non-rotting, mold- and mildew-resistant, recyclable |
| Areas of application | profiles or strips, insets in wet rooms and damp locations, façades, bath and ship furniture, vehicle construction (e.g. campers, wagons, commercial vehicles, ships, boats etc.), kitchen counter tops, basis of sandwich elements, etc. |
| Bulk density | 550 kg/m ³ (+/-40 kg), DIN EN 1602 |
| Applicable temperatures | -50° to +100° C, short term up to +250° C |
| Compressive strength¹ | ≥ 7,1 MPa, DIN EN 826 |
| Bending strength¹ | 4,5 MPa, DIN EN 12089 |
| Shearing strength¹ | 1 - 1,5 MPa, DIN EN 12090 |
| Thrust strength¹ | 1 - 1,5 MPa, DIN EN 12090 |
| Reaction to fire | normally inflammable, Class E/D-s3, dO (DIN EN 13501-1), B2 (DIN 4102), BKZ 5.3 |
| Swelling² | 0,8%, DIN EN 68763 |
| Pull-out resistance³ | 6 x 60 wood, 11.35 N/mm ² |
| Thermal conductivity | $\lambda \leq 0,087^*$ (EN 12667) or 0,096 (DIN 4108-4) W/(mk) |
| Formats | Standard format 2440 x 1220 mm, thicknesses 10 - 60 mm other formats and thicknesses upon request |
| Edges | blunt |

¹ Varies acc. to dust/grain size, portion and admixture of adhesive agents used.

² 24 hours at 20°C, depending on the surface/volume ratio, mainly reversible, without panel getting damaged.

³ Varies acc. to dust/grain size, portion and admixture of adhesive agents as well as fibrous admixtures used.

* Laboratory value

PURENIT-STANDARD PACKAGING UNITS

| Art. No. | Length | Width | Thickness | Packaging Unit | m ² /pallet |
|----------|--------|-------|-----------|----------------|------------------------|
| 112600 | 2.440 | 1.220 | 10 | 60 | 178 |
| 112602 | 2.440 | 1.220 | 15 | 40 | 119 |
| 112605 | 2.440 | 1.220 | 20 | 30 | 89 |
| 112607 | 2.440 | 1.220 | 25 | 24 | 71 |
| 112610 | 2.440 | 1.220 | 30 | 20 | 59 |
| 112612 | 2.440 | 1.220 | 35 | 17 | 51 |
| 112615 | 2.440 | 1.220 | 40 | 15 | 44 |
| 112617 | 2.440 | 1.220 | 45 | 13 | 39 |
| 112620 | 2.440 | 1.220 | 50 | 12 | 35 |
| 112625 | 2.440 | 1.220 | 60 | 10 | 29 |

Packaging height = 600 mm, weight = approx. 1000 kg, packed onto wooden one-way pallet with edge protection and shrink-wrapped, Ü-Sign

www.puren.eu

puren gmbh

Rengoldshauser Str. 4
DE-88662 Ueberlingen
Tel. +49 7551 8099-555
Fax +49 7551 8099-156
industry@puren.com
www.puren.eu



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