



# Basotect<sup>®</sup> Plastics Plus

Foam made from  
melamine resin

- Soundproofing
- Thermal insulation
- Consumer applications

BASF Plastics  
key to your success

 **BASF**  
The Chemical Company

# Basotect®

The product ...

Basotect® is a flexible, open cell foam made from melamine resin, a thermoset polymer. Its characteristic feature is its three-dimensional network structure consisting of slender and thus easily shaped webs.

... and its unique property profile

... resulting from the basic melamine resin:

- constant physical properties over a wide temperature range
- application temperature up to 240°C [464°F]
- flame resistance
- abrasiveness

... resulting from the open cell foam structure:

- low weight
- low-temperature flexibility
- high sound absorption capacity
- good thermal insulation properties

These properties of Basotect® give rise to an extensive range of application possibilities



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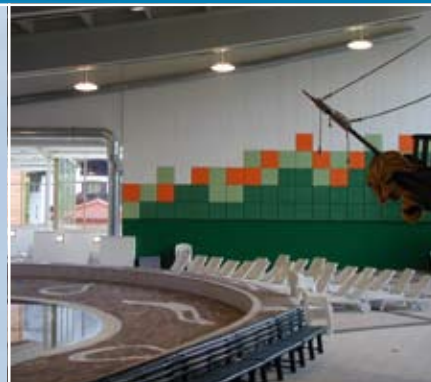
# Basotect® and its extensive range of application possibilities

Its high sound absorption capacity and safe fire characteristics (B1 classification, flame-retardant in accordance with DIN 4102, without the addition of flame-proofing agents) make Basotect® G ideal for use as sound insulation in buildings. Decoratively designed acoustic panels, suspended baffles and metal ceiling panels backed with Basotect® considerably and measurably improve the acoustics. At the same time, Basotect® paneling opens up interesting design options.

Suspended sound absorbers are finding ever-greater acceptance as an alternative to conventional ceiling systems. When constructed in a sandwich structure with a Basotect® core and decorative cover layers, these sound absorbers create a pleasant acoustic environment. A sandwich composite made up of Basotect® G with gypsum plasterboard, chipboard or plywood board and metal or plastic cover layers creates acoustically effective partition walls and room dividers. Owing to its low weight, Basotect® G allows the creation of large-surface elements that seem to be free-floating, giving rooms an attractive appearance.

Work areas exposed to high levels of noise (heavy mechanical engineering and metalworking plants, among others) can be easily restored to acoustic tolerability by retrofitting them with lightweight baffle absorbers. The low intrinsic weight of Basotect® baffles allows simple methods of attachment, for instance, by means of cable structures. Thus, the need for renewed structural engineering computations is more likely to be an exception than a rule.

The absence of fibers in the foam translates into a workplace that does not pose a burden to health. Open cell sound absorbers made of Basotect® G improve the acoustics of rooms where good understanding of speech and audibility are of paramount importance.



1



2



3



4

- 1 Acoustic panels  
Eurofoam/Germany
- 2 Cube absorbers  
Eurofoam/Austria
- 3 Conical absorber elements  
Texaa/France
- 4 Baffle absorbers  
Isofab/Canada

# Construction and Industrial applications



1

Baffle systems are also used for noise reduction in sports halls and ice rinks. This is where the special product advantages of Basotect® come to the fore: good sound absorption, low weight, high fire safety and simplicity of fastening by means of filigree cable structures. Good sound absorption and high fire safety also make Basotect® simply ideal for use in shooting ranges.



2/3

Due to its low dynamic rigidity, Basotect® is suitable for sound insulation in combination with layers of heavier material. Composite elements made up of gypsum plasterboard and Basotect® in the form of cladding for interior structures bring about a high degree of acoustic comfort due to their exceptional direct and longitudinal sound absorption characteristics.

A further area of application in the construction sector is the lining of the interior of roller shutter cases with Basotect®. This serves as thermal insulation and reduces the noise that can be generated when a roller shutter is operated.



4

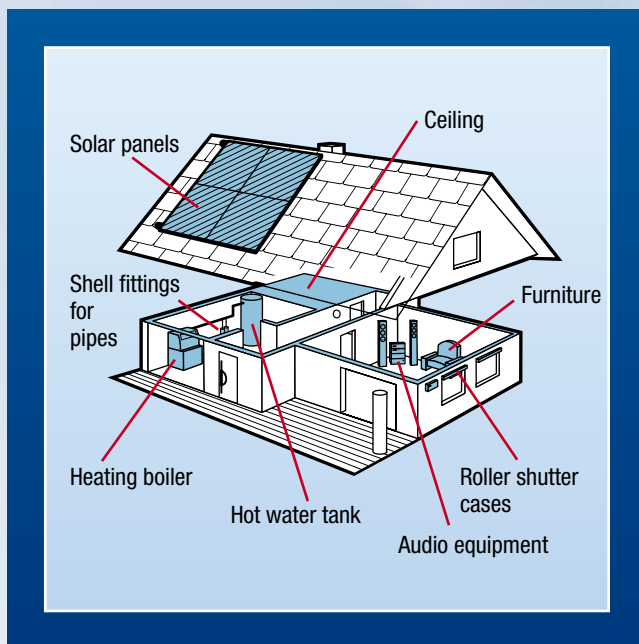
- 1 Baffle system  
Eurofoam/Austria
- 2 Ceiling sound absorbers  
Illbruck/Germany
- 3 Metal ceiling panels  
Illbruck/Germany
- 4 Ceiling sound absorbers  
Illbruck/Germany



# Basotect® and its extensive range of application possibilities



Partition walls  
Texaa/France



## Plant construction and thermal engineering in buildings

Fittings for pipes can be produced from Basotect® G using contour cutting machinery. This product's ability to withstand high temperatures (application temperature of approx. 200°C [392°F] and short-term peak temperatures of up to approx. 240°C [464°F] are possible) and its low flammability also allow it to fulfill technically demanding thermal insulation tasks, particularly where there is a requirement for the absence of fibers.

Further applications in thermal engineering in buildings include the insulation of hot water tanks and equipment. System solutions based on the flexibility of Basotect® allow the application of the insulating material over the entire tank wall. In this way, the chimney effects typical of conventional half-shell insulation can be reduced, energy losses cut and fitting simplified.

Flame-resistant thermal insulation is achieved and noise levels are reduced at the same time. Its low thermal conductivity and high long-term service temperature are the key factors accounting for its use in solar panels.

# Construction and Industrial applications

## Air conditioning

Excellent sound absorption and safe fire behavior are the most important advantages of Basotect® and thus account for its use in wing sound insulators in air conditioning equipment and ventilation systems.

The inner walls of fan housings are also lined with Basotect® to reduce noise levels.

## Acoustic test chambers, sound studios

The high sound absorption capacity and fire safety of Basotect® make it suitable for use in acoustic test chambers such as, low-reflection test chambers, engine test benches, wind tunnels and sound studios.

Highly developed composite sheet resonators (CSR) made of Basotect® constitute a modern form of resonance-like oscillating systems. Today, these allow the soundproofing of acoustic test chambers in a way that is tailor-made to the customer's specifications.



1



2



3

- 1 Ceiling panels  
Illbruck/Germany
- 2 Acoustic testing chamber  
Hanno/Germany
- 3 Tank insulation  
Foliplast/Germany
- 4 Metal panel ceiling  
Illbruck/Germany
- 5 Acoustic testing chamber  
Hanno/Germany



4



5

Basotect® and its extensive range of application possibilities

# Basotect® and its extensive range of application possibilities

Basotect® G and Basotect® TG can ideally fulfill the rising demand for soundproofing in automotive construction. Thanks to the open cell, fine structure of Basotect®, the sound absorption values in the medium and high frequency ranges are very good. Even when exacting demands are made of the sound absorption at low frequencies, the sound absorption capacity of Basotect can be enhanced by means of acoustically effective laminates. Basotect® is press-molded with felt, fabrics, metal foil and plastic film to form contour-fitting parts which are then used as sound insulators and mufflers or as heat shields.

## Automotive industry

Basotect® G and Basotect® TG are used in automotive construction together with felt covers or plastic covers. Aside from its outstanding acoustic engineering properties, Basotect's high heat resistance, high fire safety, very favorable fogging behavior, chemical resistance and, not least of all, low weight of the product are especially valued by the automotive industry.

Laminated absorber elements are suitable for installation under the hood as well as for heat shields in front of the end wall and in the transmission tunnel of automobiles. Due to their high flexural strength, covers made of Basotect® allow the production of engine hoods that offer optimized protection to pedestrians. In this way, the more stringent requirements that are now being made in terms of pedestrian protection can be met.

Due to its exceptional combination of properties, Basotect® is used for sound insulation in engine proximity shells. Other applications in the automotive industry include heat shields made of Basotect® together with aluminum foil and sun visors with Basotect® inserts.

Due to its memory effect, low weight and excellent acoustic properties, Basotect® is also used for filling hollow spaces in vehicles, for example, as filling for the A, B and C columns.



# Transportation



Engine hood cover

Photo: BASF. Manufacturer: Carcoustics



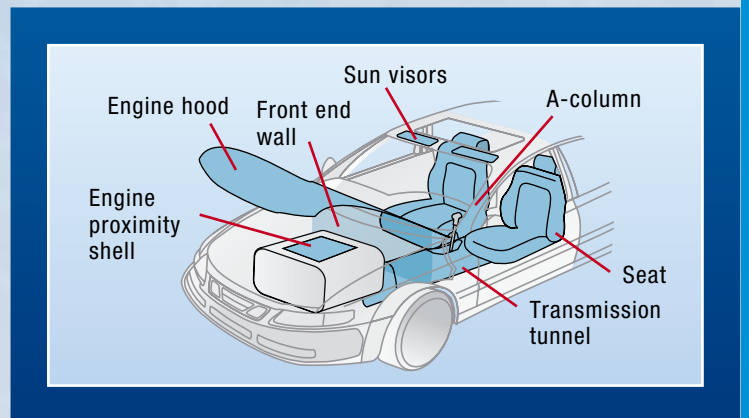
Engine proximity shell

Photo: BASF. Manufacturer: Benein Produktionstechnik GmbH

## Utility vehicles/buses

The acoustic properties of inserts made of Basotect® account for a reduction in the noise levels in the driver's cabs in trucks and agricultural machinery. Such inserts thus make an important contribution to protecting the health of occupants and to increased road safety.

Through an optimal soundproofing of the engine compartment and of the passenger area of buses, Basotect® G ensures the comfort that passengers have come to expect.



# Basotect® and its extensive range of application possibilities




Soundproofing and thermal insulation in the IC-200 of the Swiss Railway System  
Metzeler/Germany

## Rail vehicles

The excellent acoustic properties, safe fire behavior and low weight of Basotect® G make it ideal for use in backed wall and ceiling systems and for laminated interior fittings with decorative designs. Owing to the high elasticity and ease of processing of this product, complex installation work can be carried out cost-effectively.

When it comes to applications in walls and ceilings, the high level of thermal insulation brought about by the low thermal conductivity is another strong argument in favor of using Basotect®. When this foam is employed, the operating costs for climate-controlled passenger cars, for instance, can be drastically reduced.

On account of its low weight in comparison to other insulating materials, Basotect® G also contributes to energy efficiency in the transportation service itself. Additionally, the weight reduction in the wall and ceiling areas lowers the center of gravity of the cars and thus increases safety when negotiating curves. This is of particular relevance for narrow-gauge railroads.



Cladding of the payload area of launcher rockets





# Transportation



Cushions for airplane seats  
Photo: BASF. Manufacturer: Celso/France

## Ship building

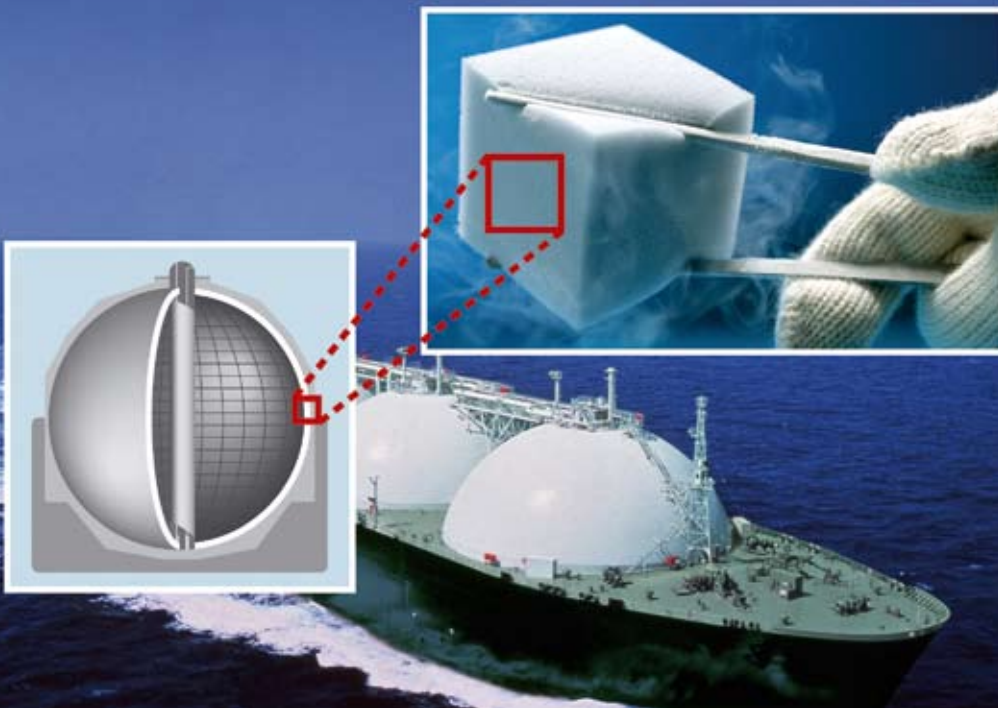
Basotect® G is employed as an acoustic system solution in small and large ships. The good low-temperature stability of Basotect® G means that it is well-suited to insulate cryogenic liquefied gas on tankers. The product's elasticity and heat insulating capacity are retained even at  $-200^{\circ}\text{C}$  [ $-328^{\circ}\text{F}$ ].

## Aerospace

The advantages of the low density and sound absorption capacity of Basotect® also permit its use in more and more system applications in the aerospace industry.

For instance, coated acoustic elements made of Basotect® are used for the cladding on the payload areas of launcher rockets. These reduce acoustic pressures, thus contributing to the protection of highly sensitive payloads such as, for example, satellites.

In aviation, Basotect® G is found mainly in seat cushions. Such seats are considerably lighter in weight than conventional ones, which helps to save fuel. Consequently, airlines can enjoy environmental and financial advantages. Basotect® is also becoming a common fixture in airplane construction as a thermal insulation and soundproofing material in the cabin.



Insulation of cryogenic liquefied gas on tankers  
Press photograph: BASF



# Basotect® and its extensive range of application possibilities

The outstanding properties of Basotect® make it ideal for areas of application that go beyond the realm of soundproofing and thermal insulation: Basotect® is also finding widespread utilization in consumer applications.

## Cleaning applications

Basotect® offers a completely new cleaning media, both inside and outside of the house. Heavy dirt on smooth, hard surfaces such as tiles, Ceran cooktops, ceramics as well as doors, leather seats and hubcaps can be thoroughly erased with Basotect®. Depending on the surface texture, one should check whether the surface is scratch-proof prior to the cleaning operation since Basotect® acts in a manner that differs from that of other cleaning products available on the market since it works without additional cleansers. The abrasive foam works like a very soft sandpaper since, unlike other foams, Basotect® is as hard as glass despite its fine pore structure and flexibility. When it is moistened, it slides easily and rubs the dirt off the surface.

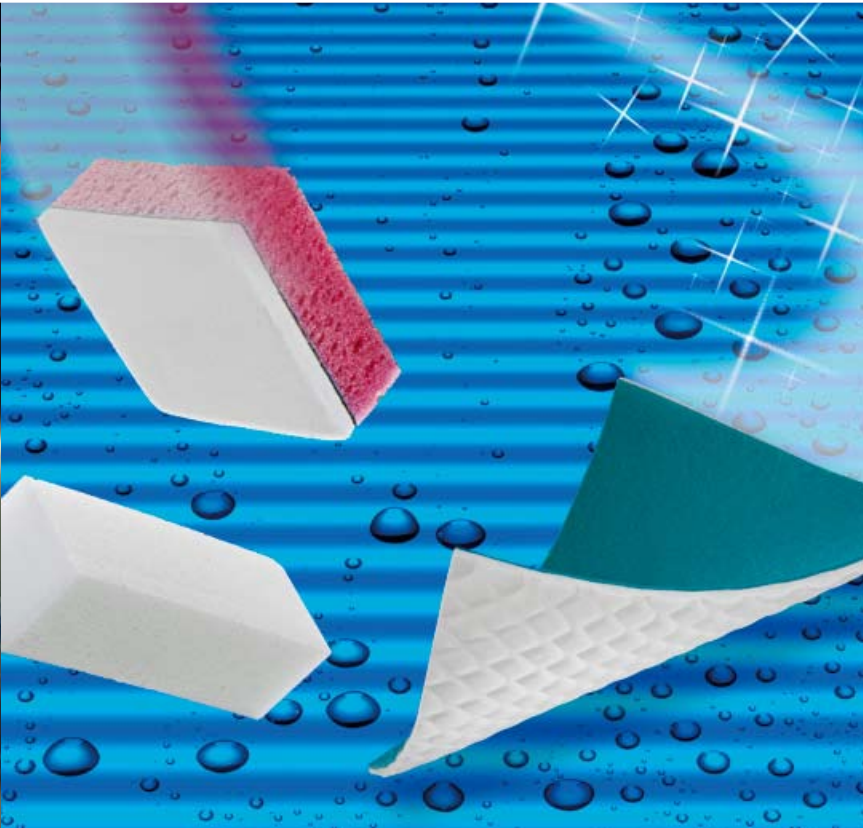
## Clothing, textiles

Shoulder pads can be made of Basotect®. They are used primarily in white outerwear. Resistance to discoloring and low weight are the key factors in this application.

# Consumer applications



Shoulder pads  
Eurofoam/Italy



Various cleaning applications  
Photograph: BASF

Basotect® and its extensive range of application possibilities

# Basotect® and its characteristic features

## Basotect® product line

Basotect® is supplied in the form of blocks with standard dimensions of 2500 x 1250 x 500 mm to processors who produce shaped parts for diverse applications by cutting, stamping and pressing. Special dimensions can also be supplied on request.

Basotect® is used in a wide array of application areas. The different types of Basotect® take these into account:

**Basotect® G** comes into play in technical applications. Its gray coloration precludes it getting dirty, which facilitates its handling when it is being processed.

Special technical applications that call for the thermal deformation of Basotect® can be implemented with **Basotect® TG**. Its dark-gray coloration make it a material of choice it for use in automotive construction.

The white version of **Basotect®** has established itself for numerous consumer applications.

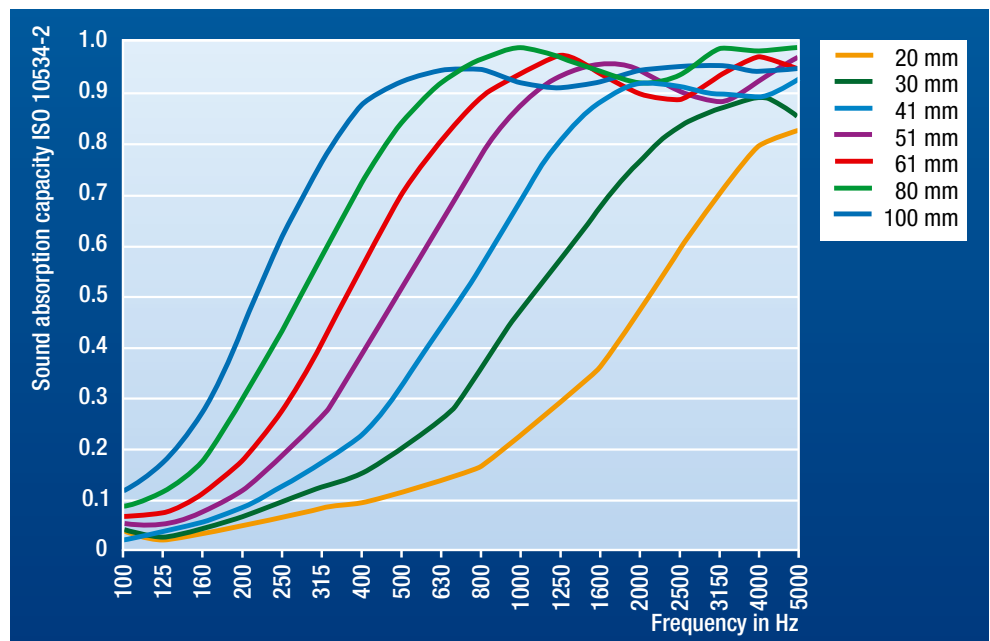
**Basotect® UL** stands out for its ultralight weight and is thus especially well-suited for all applications that call for a low weight in, for example, aviation and aerospace.



Packaging of Basotect® blocks  
Photograph: BASF

## Physical properties

Basotect®'s attractive range of properties is compiled in the respective technical information material.





## Resistance to chemicals

Thanks to Basotect®'s highly cross-linked structure, it is resistant to all organic solvents. When it comes to acids and alkalis, the resistance has to be checked in concrete application cases since the temperature, the exposure time and the concentration all have a great deal of influence on the resistance of the foam to these media.

Table 1: **Chemical resistance according to DIN EN ISO 175 (7 days of immersion in the test media. Evaluation of the resistance by measuring the compression set according to ISO 3386-1)**

Media group	Medium	Concentration	Evaluation*
Acids	Hydrochloric acid	10 %	–
	Nitric acid	10 %	–
	Sulfuric acid	10 %	–
	Phosphoric acid	50 %	–
	Formic acid	90 %	–
	Acetic acid	50 %	+
	Lactic acid	10 %	+
	Citric acid	10 %	+
Alkalis	Sodium hydroxide solution	40 %	+
	Ammonium hydroxide	25 %	+
	Sodium carbonate	25 %	+
	Water		+
	Salt solutions		+
	Hydrogen peroxide	30 %	–
	Sodium hypochloride	10 %	–
Alcohols	Methanol		+
	Ethanol		+
	Isopropanol		+
	Butanol		+
	Glycols		+
	Glycerin		+
Esters	Butyl acetate		+
	Ethyl acetate		+
	Diethylether		+
Hydrocarbons	Gasoline		+
	Diesel		+
	Kerosene		+
Ketones	Acetone		+
Other solvents	Diethylether		+
	Dichloromethane		+
	Glycoether		+
Aggressive gases	Chlorine	low concentration	+
		high concentration	–
	Ozone	low concentration	+
		high concentration	–

\*) + resistant  
o limited resistance  
– not resistant

## Environmentally sound

Basotect® is produced without using halogenated hydrocarbons, flame-retardants and/or toxic heavy metals. Basotect® does not contaminate water. The product is free of blowing agents when it is supplied and is not subject to labeling requirements under the German hazardous material regulations.

Solutions with Basotect® reduce the weight of the components, thereby contributing to energy savings and to a reduction in emissions. The excellent cleaning effect is achieved without the need for any other chemical cleaning agents.

Thanks to its property profile, Basotect® contributes to efficient energy utilization and to improving the well-being of people in buildings and vehicles.

# Processing of Basotect®

## Machining

Basotect® in the form of foam blocks is supplied to processors for further processing. This is where the Basotect® is cut into multidimensional shapes by slitting or wire cutting or else by milling, sawing and stamping to form the required contour.

The elastic resilience of the Basotect® panels also allows the use of shaped cutting.

## Coating, bonding

Surface coatings for coloring purposes or for improving the mechanical properties can easily be applied to the finecell Basotect® surface by spraying, for example.

By the same token, a very wide range of adhesives commonly available on the market can be used for bonding Basotect® sections. Adhesives containing solvents as well as reactive resins can also be used without any problem. This means that numerous material combinations are possible. It should be kept in mind, however, that processing with adhesives changes the flammability properties of the components.

## Impregnating, thermoforming

Numerous Basotect® shaped parts are produced by means of thermoforming. Since conventional Basotect®, a thermoset polymer, cannot be thermoformed, the Basotect has to be impregnated with a thermally reactive adhesive liquid. This is done in post-production using so-called impregnating systems. In order to accelerate drying, the excess liquid is squeezed out by means of a two-roll mill after impregnation. The impregnated Basotect® can then be processed by means of thermoforming. Composite materials consisting of a Basotect® core and felt, fabric, metal and plastic laminates can be manufactured in one pressing procedure. The hot-press process can also be used to emboss decorative patterns on the surface of the Basotect® panels.

Intensive research work has led to the development of a thermoformable Basotect® type – Basotect® TG. Sections cut from Basotect® TG can be formed at a temperature of >200°C [>392 F] to produce three-dimensionally shaped components. This dispenses with the impregnation step with the adhesive liquid as is needed with Basotect® standard grades in order to produce such shaped parts. This manifests itself in greater cost-effectiveness in the processing steps. Along with the fact that Basotect® TG can be thermoformed without a preceding impregnation step, it also has the proven material properties of the standard grade.

Stamped Basotect® shaped parts  
ENAC/France

Basotect® shaped part with aluminum foil and felt  
Photograph: BASF



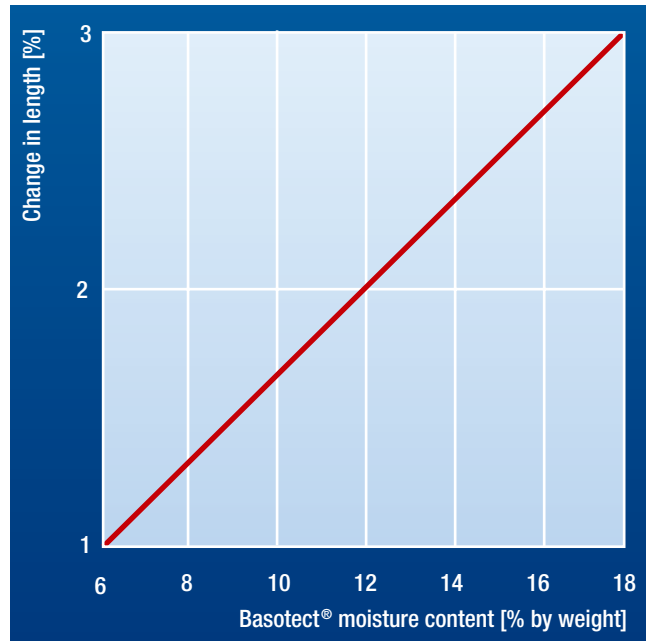
### Hydrophobing, oleophobic

Basotect® is an extremely open cell foam with highly hydrophilic and oleophilic properties. Cut sections of Basotect® can be rendered water-repellent by impregnating them in silicon emulsions. Fluorocarbon resins allow hydrophobing and oleophobic in one single step. It is practical to carry out the hydrophobing and oleophobic in an impregnation procedure as mentioned above.

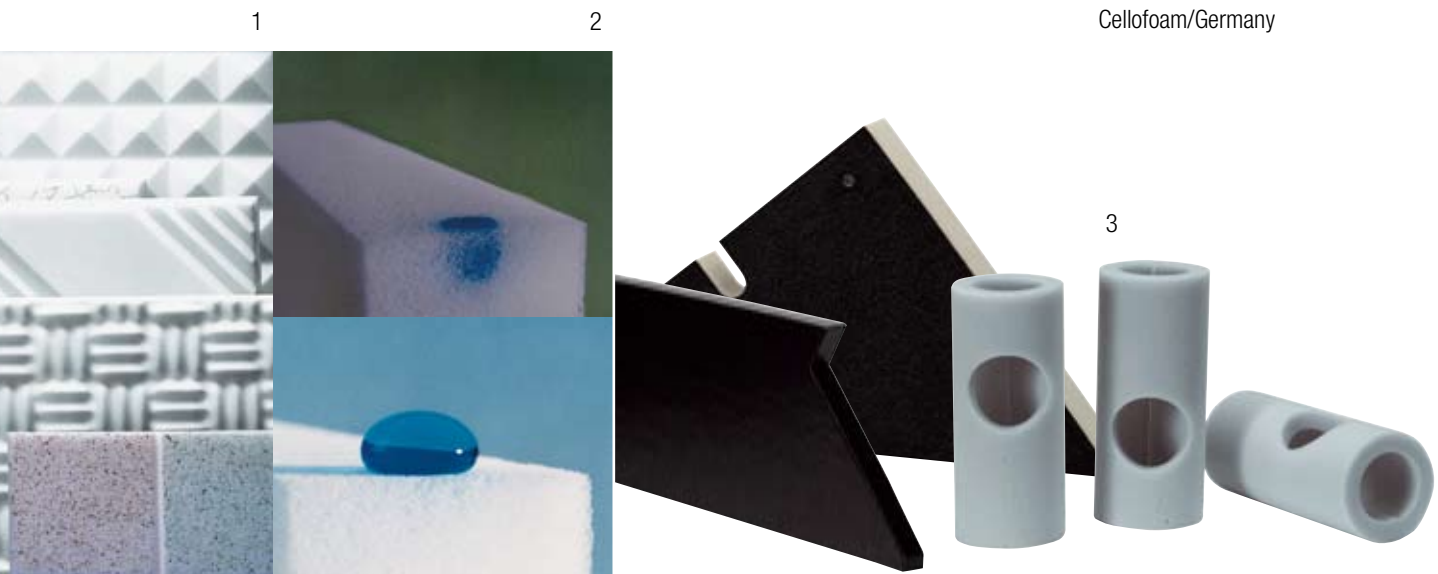
### Processing notes

Any dust that might be produced during certain processing steps should be removed by suction directly at the cutting site. The wearing of a dust mask during these tasks is recommended.

Due to the absorption behavior of melamine resins and the open cell structure of the foam, the moisture content of the material changes as a function of ambient conditions. This is associated with changes in the dimensions (Fig. 4) that occurs similarly in the case of wood, concrete or clay tiles. This behavior must be taken into consideration during processing. The foam blocks sealed in PE film as delivered must be unpacked and stored for at least three days prior to processing under atmospheric conditions corresponding to their later use.



- 1 Photograph: BASF Ceiling panels
- 2 Basotect®, subsequently rendered water-repellant by means of impregnation
- 3 Basotect® shaped parts Cellofoam/Germany





## Basotect® - the global foam with customers in almost all corners of the world



### Basotect® – a PlasticsPlus™ foam

Basotect® is a specialty foam from the PlasticsPlus™ product line of the Styrenics Operating Division. With PlasticsPlus™, BASF remains true to its motto, "We help our customers to be more successful". Since we are well aware that we have to do more for your success than just supply granules, we offer PlasticsPlus™, a portfolio of specialty foams that have "that something extra". Be it in construction, automotive or consumer applications, PlasticsPlus™ stands for four pillars that support the success of our customers: innovation, reliability, partnership and diversity.



#### Additional information

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# Product Overview

Autofroth®*	Polyurethane system	PU
Basotect®	Foam from melamine resin	MF
Capron®	Polyamide	PA
Cellasto®*	Components made from microcellular PU elastomers	PU
CeoDS®*	Multifunctional composites made from Cellasto components	PU
Colorflex®	Service for the self-coloring of polystyrene and ABS	
CosyPUR®*	PU soft foam system	PU
Ecoflex®	Biodegradable plastic/polyester	
Ecovio®	Biodegradable plastic/polyester on the basis of renewable raw materials	
Elastan®**	Systems for sports field surfaces	PU
Elastoclear®*	PU system	PU
Elastocoat®*	PU systems as coating and casting compounds	PU
Elastocoast®*	PU systems as coating and casting compounds	PU
Elastocore®*	PU cast system	PU
Elastoflex®**	Soft polyurethane foam systems	PU
Elastofoam®*	Soft integral polyurethane foam systems	PU
Elastollan®**	Thermoplastic polyurethane elastomers	PU
Elastolit®*	Rigid integral polyurethane foam systems and RIM systems	PU
Elastonat®*	Flexible integral polyurethane systems	PU
Elastopan®**	Polyurethane shoe foam systems	PU
Elastopir®*	Rigid polyurethane foam systems	PU
Elastopor®**	Rigid polyurethane foam systems	PU
Elastoskin®**	Flexible integral polyurethane systems	PU
Elastospray®**	PU spray foam system	PU
Elasturan®**	Systems as cold curing cast elastomers	PU
Lupranat®*	Diisocyanates	PU
Lupranol®*	Polyether polyols	PU
Lupranol®* Balance	Polyether polyols	PU
Lupraphen®*	Polyether polyols	PU
Luran®	Styrene/acrylonitrile copolymer	SAN
Luran® S	Acrylonitrile/styrene/acrylate polymer	ASA
Luran® SC	Acrylonitrile/styrene/acrylate polymer and polycarbonate	ASA+PC
Miramid®	Polyamide	PA 6, PA 66
Neopolen® E	Polyethylene foam	EPE
Neopolen® P	Polypropylene foam	EPP
Neopor®	Expandable polystyrene	PS-E
Palusol®	Alkali silicate	
PERMASKIN®	System for coating components	
Peripor®	Expandable polystyrene	PS-E
PlasticsPortal™	Web-based e-Commerce platform for solutions and information	
Pluracol®**	Polyether polyols	PU
Polystyrol, impact-modified	Polystyrene HIPS	PS-I
Polystyrol, standard	Polystyrene GPPS	PS
SPS™**	Steel-polyurethane systems	PU
Styrodur® C	Extruded rigid polystyrene foam	XPS
Styroflex®	Styrene/butadiene block copolymer	SB
Styrolux®	Styrene/butadiene block copolymer	SB
Styropor®	Expandable polystyrene	PS-E
Terblend® N	Acrylonitrile/butadiene/styrene polymer and polyamide	ABS+PA
Terluran®	Acrylonitrile/butadiene/styrene polymer	ABS
Terluran® HH	Acrylonitrile/butadiene/styrene polymer	ABS
Terlux®	Methyl methacrylate/acrylonitrile/butadiene/styrene polymer	MABS
Ultradur®	Polybutylene terephthalate	PBT, (PBT+ASA)
Ultraform®	Polyoxymethylene	POM
Ultramid®	Polyamide	PA 6, 66, 6/66, 6/6T
Ultrason® E	Polyethersulfone	PESU
Ultrason® S	Polysulfone	PSU

® = reg. trademark of BASF Aktiengesellschaft  
 ®\* = reg. trademark of Elastogran GmbH  
 ®\*\* = reg. trademark of BASF Corporation

TM = trademark of BASF Aktiengesellschaft  
 TM\* = trademark of Elastogran GmbH

## Please visit our websites:

### BASF Plastics:

[www.plasticsportal.com](http://www.plasticsportal.com) (World)

[www.plasticsportal.eu](http://www.plasticsportal.eu) (Europe)

### Additional information on

#### specific products:

[www.plasticsportal.eu/name of product](http://www.plasticsportal.eu/name_of_product)

E. g. [www.plasticsportal.eu/ultramid](http://www.plasticsportal.eu/ultramid)

### Polyurethanes:

[www.basf.com/polyurethanes](http://www.basf.com/polyurethanes)

[www.elastogran.de](http://www.elastogran.de)

### PVC and PVCd:

[www.solvinpvc.com](http://www.solvinpvc.com)

## Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processor from carrying out own investigations and tests neither do these data imply any guarantee for certain properties nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and does not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. (September 2007)



### **Our Plus provides your Plus**

*BASF's PlasticsPlus™ covers a range of specialty plastics with the performance that you need. High-performance plastics, biodegradable materials, and foams: PlasticsPlus™ provides ideal solutions wherever plastics have to meet special requirements. We rate diversity and reliability, innovative solutions and partnership as key factors in providing value to our customers.*