

Palusol® Palusol SW

The innovative choice for
intelligent fire protection

Palusol® in the web: www.palusol.com

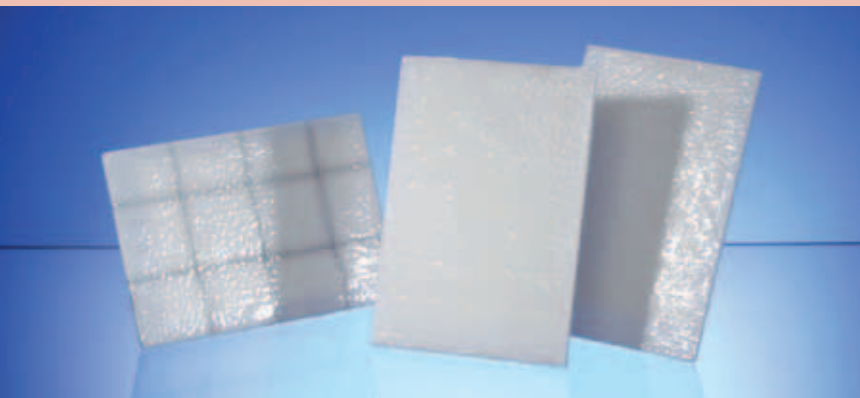
 **BASF**

The Chemical Company

Palusol and Palusol SW

Palusol® fire-protection panels are classified as non-combustible building material. In case of fire, the silicate panel expands under the action of heat with generation of foaming pressure. The non-combustible, heat-insulating and pressure-resistant foam formed prevents fire and smoke from spreading to other rooms for a given period of time by filling joints and gaps.

The new Palusol SW, a ready-made sandwich product composed of Palusol fire-protection panels and high-density fiberboards, can be integrated into fire doors and carries existing certification under ASTM (American Society for Testing and Materials) and BS (British Standard).



Properties

Constructions with built-in panels, strips or other cut-to-size sections made from Palusol offer:

- Reliable resistance to fire and smoke for a defined period of time, even in critical zones
- Classification for Palusol as “non-combustible” in accordance with building materials class DIN 4102-A2 or for Palusol SW as “combustible” in accordance with DIN 4102-B2
- Low response temperature and short response times: Palusol begins to foam at 100 °C and develops a marked foaming pressure at 120 °C
- The combination of fire and smoke protection with insulation against noise and/or heat
- Low component thickness, i.e. low construction and production costs for components
- Absorption of heat by evaporating water produces an additional cooling effect

Quality, proven long-term performance and effectiveness

To be able to guarantee effective fire protection, two things are especially important: consistency and uncompromising quality. Palusol fire-protection panels have proven themselves over more than 40 years. Tests have confirmed the long-term effectiveness of Palusol. Burning tests on twelve year old fire doors have proven that the fire-protection function of the doors is maintained even after they have been used for many years. In addition, test results are available from long-term effectiveness studies on 25 year old Palusol fire-protection panels. To maintain the high quality standards, Palusol fire-protection panels and components equipped with them are subject to continual quality monitoring (internal and external) in many countries.





Service

Apart from the silicate-based Palusol, the BASF portfolio also includes, via its subsidiary Dr. Wolman GmbH, fire-protection products based on ammonium phosphate and also products based on expanded graphite.

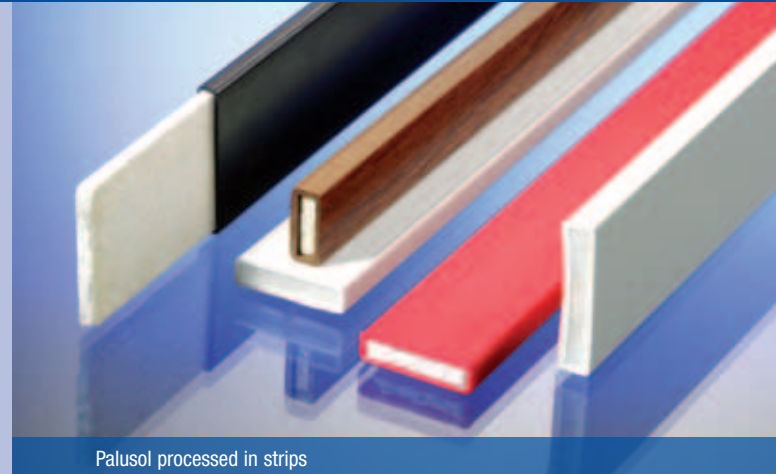
Sales and Production Sites

Palusol and Palusol SW can be procured worldwide. BASF supplies its customers from its headquarters in Ludwigshafen. In addition to BASF, distributors ensure product availability throughout the world.



Examples of the use of Palusol

Trouble-free handling, simple machining and processing methods make Palusol® fire-protection panels a versatile building material for use in various fire-protection applications.



Palusol processed in strips

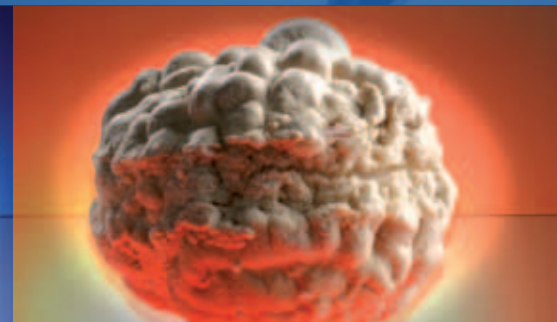


Fire-protected cable bulkhead

Photo: Wichmann Brandschutzsysteme



Palusol before ...



... and after being subjected to heat

Fire Doors

Self-closing devices which are intended to prevent fire and smoke from getting through openings in walls and ceilings for given times can effectively be equipped with cut-to-size sections, mostly strips, of Palusol. They are arranged in doors, gates and flaps made of wood or steel in such a way that in case of fire they seal joints and gaps securely in a very short time.

The time for which fire protection is provided, depending on the construction of the component, can be up to 120 minutes.

Bulkheads

The following components can be provided with fire protection by means of Palusol:

- Pipe bulkheads for pipe post conduits, wastewater pipes, etc.
- Cable bulkheads for cable conduits
- Ventilation bulkheads in fire walls and dividing walls

Here, Palusol effects rapid and lastingly effective closure of the cross sections in case of fire by filling them with the pressure-resistant, non-combustible silicate foam.



In case of fire ventilation bulkheads with Palusol inside seal joints and gaps securely.



Fire protection for valuable documents and articles in safes

Security cabinets

Here too, Palusol offers long-lasting protection against fire and prevents the loss of valuable goods in strongrooms, filing cabinets and other security cabinets. Palusol also protects people against injury and prevents further intensification and spread of a fire due to readily flammable, explosive substances in safety cabinets.

In addition, there are many further possible uses for Palusol fire-protection panels which result from efforts to develop functional constructions to prevent and limit the spread of fire and smoke.



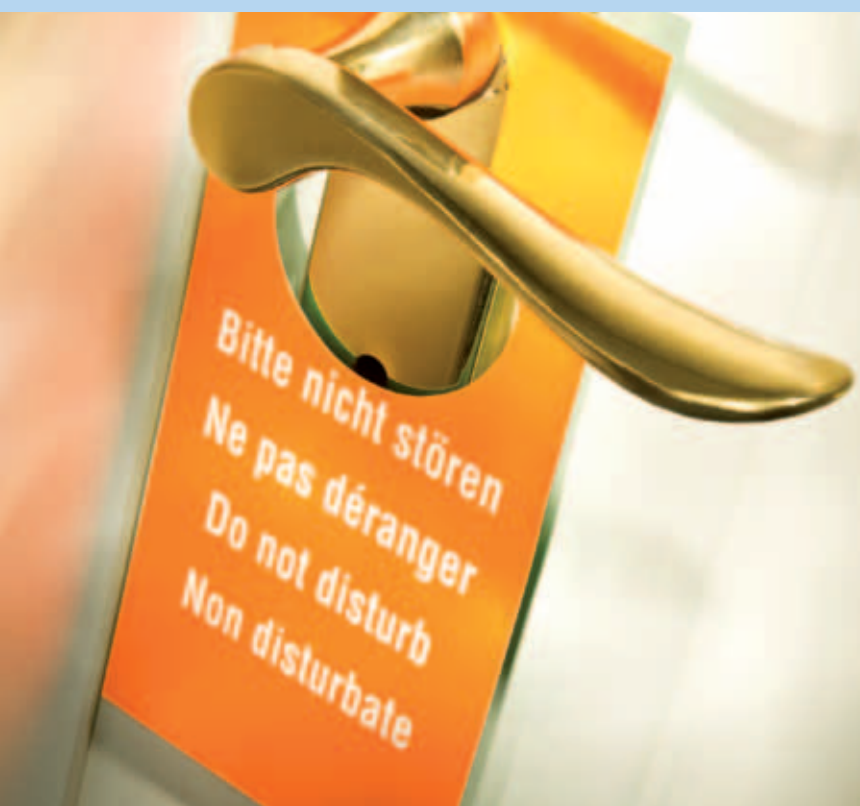
Fire-protected cable bulkheads

Photo: Wichmann Brandschutzsysteme

Palusol SW

Palusol® SW products consist of Palusol fire-protection panels and high-density fiberboards (HDF). This combination conforms to the building materials classification in accordance with DIN 4102-B2.

The new Palusol SW can be obtained in different structural versions: simple as a combination of a Palusol fire-protection panel with two HDFs, or as diverse as multilayer sandwich structures.



Sleep peacefully thanks to Palusol SW



Photo: Schörghuber Spezialtüren KG, Ampfing

Palusol fire door in the Ritz Carlton Hotel, Berlin

Applications

Palusol SW sandwich panels have been specially developed for the manufacture of fire doors and for use in fire walls.

The production process is stream-lined with the elimination of the step of gluing individual sheets of Palusol to high-density fiberboards (HDF).

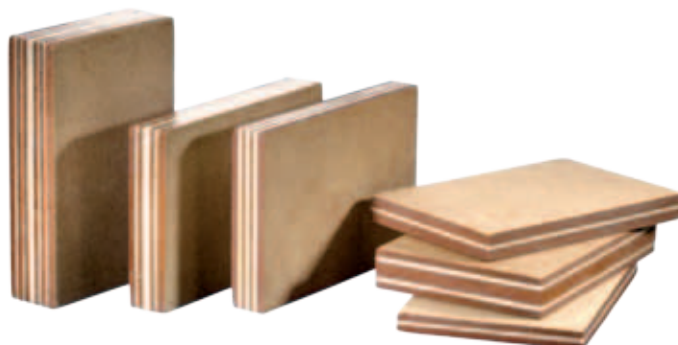




Photo: Stephen Cridland

Palusol SW fire walls in the yachts of Christensen Yacht

Certification

In addition to the actual Palusol SW products, BASF also has certifications in its portfolio. Burning tests have been carried out at various institutes on fire doors based on wood, especially “paneled doors”. Certificates of fire resistances in the range from 20 to 90 minutes have been obtained.

For special applications, for example in shipbuilding, users have carried out their own tests, such as the IMO (International Maritime Organization), and have gained product certificates.

Product advantages of Palusol SW



Palusol SW door core

Advantages of the use of Palusol SW:

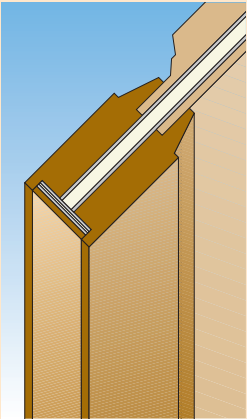
- Simple adhesive bonding using commercial wood adhesives (white glues) is possible
- Saving of costly and laborious process steps
- Product certifications for resistance to fire are available from Intertek Testing Services for ASTM and from Chiltern International Fire for British Standard.
- The HDFs used are classified E0/E1 and are additionally FSC certified.
- Licensing by BASF SE
- Cost-efficient use of our product range is ensured by our wide variety of products.
- Relatively thin-walled door cores ensure reliable resistance to fire for up to 90 minutes.
- Use of one Palusol® SW product as door core and edge seal is possible (Palusol SW 20-1).
- Our thin-walled door cores offer a high degree of freedom in configuring the doors individually (fire protection, acoustic insulation, protection against burglary, insulation against climatic influences, etc.).
- Manufacture of customized sandwich elements possible



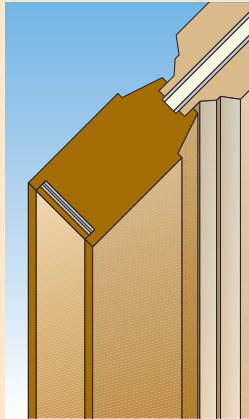


Efficient fire protection with a wide variety of design freedom

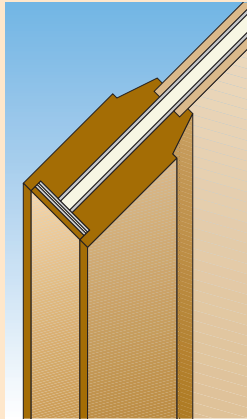
Door construction examples using Palusol SW



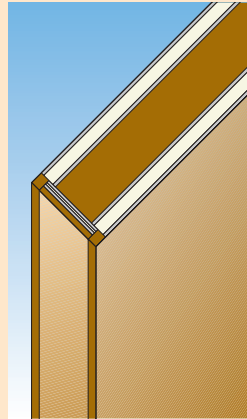
Panel door applications (full panel or multi panel) for raised or flat configurations



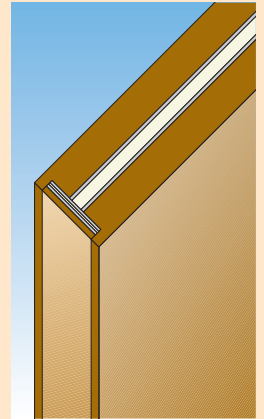
Stile and rail panel door applications



Flat panel applications



Improving existing door designs for fire requirements



Flush door applications (multi function doors)

Technical Data for Palusol ...

The use of Palusol® fire-protection panels as “building materials that intumesce in the case of fire” for fire-resistant components has been approved for the general purposes of building in Germany under the approval number Z-19.11-14 of the Building Institute in Berlin (first approval 1977).

Palusol fire-protection panels are also monitored by “Underwriters Laboratories Inc.” and by “Intertek Testing Services”, USA.

Processing

Cutting, working and adhesive bonding

Palusol is supplied from the factory with an epoxy resin coating on each side. Cut edges which arise during processing must be coated and adequately protected.

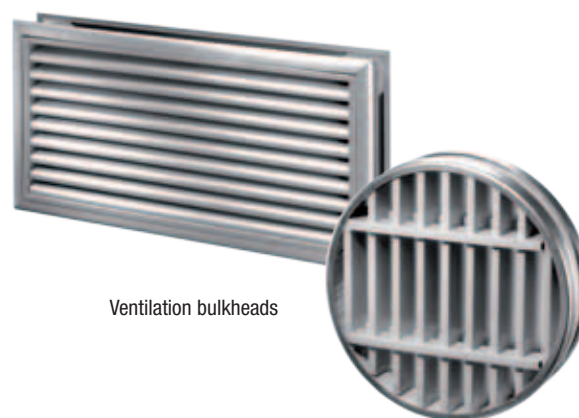
Palusol fire-protection panels can be cut by means of conventional shears used for sheet metal. Small parts can be produced using stamping tools. In addition, Palusol fire-protection panels can be nailed, sawn and drilled and can be bonded using adhesives or glues which adhere well to epoxy resin. When heated to above 60 °C, the panels can be readily shaped and can be converted into the desired form by folding, rolling, etc.

Safety precautions during processing

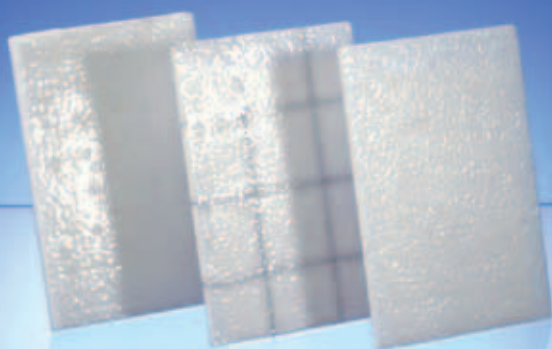
Except for the sodium silicate dust which may be created as a result of shaping (cutting, sawing), Palusol is free of harmful components which constitute a hazard to human health. Gases evolved in the case of fire or smoldering are officially classified as non-hazardous. Further information regarding the processing of Palusol may be found in the technical information leaflet and the safety data sheet for Palusol fire-protection panels.

Storage and Transport

Palusol should be protected from water, high atmospheric humidity and sustained temperatures above 40 °C. Palusol is frost-resistant. The panels should always be stored lying horizontally and supported over their entire area. The wearing of protective gloves is required.



Ventilation bulkheads



Form supplied

Sheet dimension 2100 x 1100 mm	Sheets per pallet	Weight [kg/m ²]	Thickness [mm]	Density [kg/dm ³]
Palusol 100	100	3	1.9 ± 0.4	1.6
Palusol 210	100	3	1.9 ± 0.4	1.6
Palusol 104	50	6	3.6 ± 0.6	1.6

... and Palusol SW

Processing

Cutting/Working

Palusol® SW can be worked using standard woodworking machinery (sawing, milling, drilling, etc.). Carbide tipped cutting tools are advantageous in order to obtain longer usage. Cut edges which arise during processing must be coated and adequately protected.

Adhesive bonding

The outer layers of Palusol SW products consist of HDFs and can therefore be adhesively bonded by means of commercial wood glues (white glues). Choice of adhesive and bonding conditions have to be optimized experimentally in each individual case. In the case of hot glue processes, it must be ensured that the Palusol layers between the HDFs are not heated to temperatures above 80 °C.

Safety precautions during processing

Sodium silicate dust is created during sawing or milling of Palusol SW. It must not get into the eyes or respiratory passages and the use of appropriate extraction facilities and the wearing of safety glasses and a dust mask are therefore advisable. Central facilities as are used, for example, in the woodworking industry are satisfactory for Palusol SW. However, in the case of Palusol SWR (wire mesh insert), separate extraction systems should be used since there is a risk of sparks being produced. Further information about the processing of Palusol SW may be found in the technical information leaflet and the safety data sheet for Palusol fire-protection panels.

Approvals and Component Testing

In Germany, Palusol SW products are approved under the existing building material approval for Palusol Z-19.11-14.

ASTM Standard

Component tests have been carried out in the NAFTA region. The corresponding product/component certifications are available from Intertek Testing Services.

British Standard (476, Part 22)

Component tests have been carried out in Great Britain. The corresponding product/component certifications are available from Chiltern International Fire Ltd.

Storage and Transport

Palusol SW should be protected from water, high atmospheric humidity and sustained temperatures above 40 °C. Palusol SW is frost-resistant. The panels should always be stored lying horizontally and supported over their entire area. The wearing of protective gloves is required.

Form supplied

ASTM Sheet dimension 85 x 43.7 [inch]	Sheets per pallet	Weight per sheet* [lbs]	Thickness* [inch]
Palusol SW-2	70	33	3/16
Palusol SW-3	50	48	9/32
Palusol SW 20-1	45	46	5/16
Palusol SW 45-1	23	92	5/8
Palusol SW 60-1	23	93	5/8
Palusol SWR 90-1	20	108	5/8
Palusol SWR 90-2	14	154	7/8

ASTM Sheet dimension 97 x 43.7 [inch]	Sheets per pallet	Weight per sheet* [lbs]	Thickness* [inch]
Palusol SW 20-1 XL	30	53	5/16
Palusol SW 45-1 XL	15	106	5/8
Palusol SW 60-1 XL	16	108	5/8
Palusol SWR 90-1 XL	14	126	5/8
Palusol SWR 90-2 XL	10	181	7/8

British Standard Sheet dimension 85 x 43.7 [inch]	Sheets per pallet	Weight per sheet* [lbs]	Thickness* [inch]
Palusol SW 4	25	60	13/32

SWR = Sandwich **R**einforced (sandwich with stainless steel mesh insert)

SWR 90-1 = for single door applications

SWR 90-2 = for double door applications

* nominal dimensions



The mark of
responsible forestry

All Palusol SW products are FSC-certified and denoted by this logo.



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 processors from carrying out own investigations and tests; neither do these data imply any guarantee of 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 do 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. (March 2012)

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