

HUNTSMAN

Enriching lives through innovation

About Huntsman

Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated chemicals with 2016 revenues of approximately \$10 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 100 manufacturing and R&D facilities in approximately 30 countries and employ approximately 15,000 associates within our 5 distinct business divisions including the Pigments and Additives division that we intend to IPO or spin-off as Venator Materials Corporation. For more information about Huntsman, please visit the company's website at www.huntsman.com.

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Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Polyurethanes and Huntsman Performance Products containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards. Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.

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DaltoPUR[®] FR

Fire-rated PUR-based foam technology

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AN EASY-TO-PROCESS, FIRE-RATED PUR-BASED FOAM TECHNOLOGY
Demonstrating progress in panel production and performance

Insulation experts and foam technologists at Huntsman have developed DaltoPUR®FR – a fire-rated polyurethane (PUR) insulation technology designed to improve the manufacture and performance of composite sandwich panels.

Offering a consistent Class E foam at all panel thicknesses, and achieving Cs3d0 or better in Single Burning Item (SBI) tests, across a variety of panel joint designs and thicknesses, DaltoPUR®FR-based insulating foam is lightweight, and has low thermal conductivity and moisture resistance properties. With a reaction profile optimized to allow easy foam processing, our DaltoPUR®FR foam technology can give panel producers the flexibility to quickly and efficiently manufacture different panel types, of varying thicknesses.

Foams based on DaltoPUR®FR technology have low friability. The required minimum conveyor temperature is 40°C. DaltoPUR®FR foam technology can deliver the required bottom adhesion and long-term durability required, without the use of a primer. Lambda values can be further improved through the choice of specific blowing agents. Furthermore, it is easy to shift from Class F to Class E production since the processing conditions (40°C conveyor temperature, no primer) are identical.

Using our DaltoPUR®FR insulation technology, panel producers can achieve:

- Improved foam processing through foam wave stability and flat panel surfaces
- Similar laminator conditions as for class F (easy to switch)
- A minimum result of Cs3d0 in SBI tests
- All required physical properties and low lambda values at very competitive densities

We also offer panel producers a family of fire-rated PIR-based foam technologies (DaltoPIR®), a range of fire-rated PIR core panel primers (DaltoPIR PRIM®) and adhesives (DaltoSTICK®) for all types of solid insulating cores.



THERMAL INSULATION



FIRE PROPERTIES



PROCESSABILITY



PANEL DURABILITY

Fire-rated and non fire-rated product range

	DaltoPUR® STD	DaltoPUR® FR	DaltoPIR® FR	DaltoPIR® HFR	DaltoPIR® XHFR
Reaction to fire	F	min. Cs3d0	Bs2d0	Bs2d0	Bs1d0
Fire resistance (100 mm)			EI 15	EI 30	EI 30
Conveyor temperature (°C)	40	40	50	60	60
Iso / Polyol ratio	155 – 165	165 – 180	185 – 210	250 – 265	250 – 280
DaltoPIR® PRIM	Not required	Not required	Recommended	Required	Required
Overall density (kg/m³)	38 – 39	39 – 41	38 – 42	38 – 42	38 – 42
Initial lambda (mW/mK at 10°C)	18 – 21	18 – 22	18 – 21	18 – 21	18 – 21

A trusted polyurethane partner for panel producers



With deep knowledge and expertise in sustainable construction, lifecycle analysis and building fire safety, we are a recognized leader in the polyurethane-based insulation market.

A long-established supplier and a trusted partner to the composite panel industry, our research experts, foam technologists and adhesive specialists have a strong commitment to driving progress in panel production and performance.

Working from a technical center in Ternate, Italy, dedicated to insulation innovation, our team ensures that our foam and adhesive products are optimized to meet the ever-evolving needs and legislative requirements of the fast-paced composite panel sector, and the global construction industry that it serves.