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FENOSOL™

Fireproof rigid foam for impact absorption, filling, insulation and fire protection.



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Rév.	Rédaction	Vérification	Approbation	Date

DESCRIPTION

FENOSOL™ is rigid phenolic foam designed to cushion impacts and falls, to insulate and to protect high safety packing. It has been developed to fulfill the requirements of defense or nuclear industry sensitive equipment transportation casks. Thanks to its outstanding mechanical properties, FENOSOL™ is also used as a static shock absorber on sites to minimize the consequences of the fall of loads.

FENOSOL™ can be:

- injected directly into the final packing to fill all cavities
- Cast into a standard mold and machined into pieces of complex shapes.

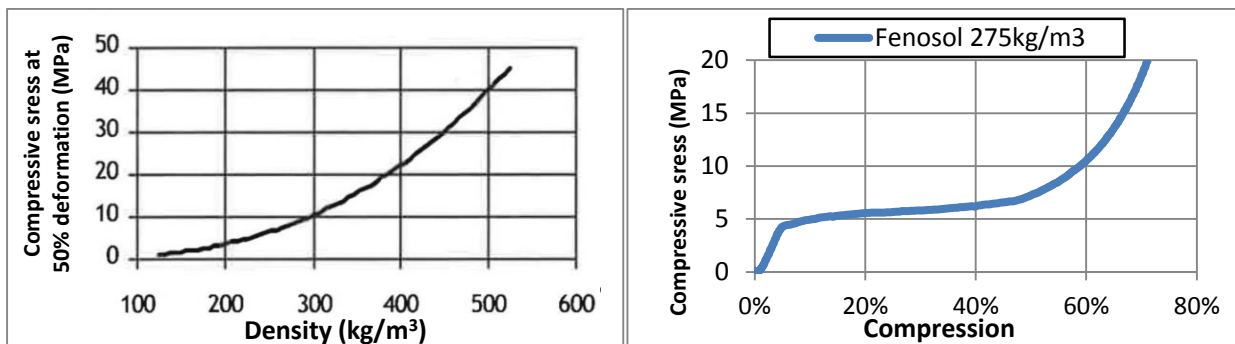
Our research laboratory works hand in hand with our clients to adapt the product and its manufacturing to any specific application.

DENSITY

A large panel of densities is available to fulfill the customer's needs:

- From 30 kg/m³ for applications that favor thermal insulation properties.
- Up to 700 kg/m³ for structural foams designed for application where outstanding mechanical properties are required.

MECHANICAL PROPERTIES



FENOSOL™ has excellent mechanical properties. Its outstanding compressive stress over density ratio makes it one of the best shock absorbers of the market to protect objects and structures when space and weight are limited:

For example, a FENOSOL™ foam shock absorber of density 200 kg/m³ can cushion stresses of 3 MPa while a density of 275 kg/m³ cushions stresses of 6MPa.

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THERMAL PROPERTIES

FENOSOL™ is an excellent thermal insulator. Its high ratio of closed cells provides a low thermal conductivity that can reach very low values for foams under 100 kg/m³. The mechanical properties of FENOSOL™ are extremely robust to temperature changes, and this foam can be used between -180°C and + 120°C.

FIREPROOF PROPERTIES

FENOSOL™ is a thermosetting foam, and is thus unable to melt in case of fire exposure. FENOSOL™ is ranked M1 and F1 according to the French norms, i.e. FENOSOL™ does not propagate heat or flames, and does not produce black or toxic fumes. FENOSOL™ is not subject for post-combustion either. Therefore it is an excellent firebreak material, as a 3 cm thick board of FENOSOL™ can sustain 800°C flame for 30 minutes.



When subjected to thermal stress, FENOSOL™ maintains its structure and remain in position on the support material.

ENVIRONMENTALLY FRIENDLY

FENOSOL™ contains neither CFC nor HCFC, it is fibreless and odorless. Thus, FENOSOL™ contributes to the environment's preservation by bringing safety and reliability.

AVANTAGES

- Rigid and lightweight material
- Outstanding mechanical properties.
- Excellent thermal insulation properties.
- Fireproof. Produce no black or toxic fumes. No flame propagation.
- A large density panel to adapt to every situation.
- Cast or molded. Can fill complex shapes and small volumes.
- Low permeability to vapor. High moisture resistance.
- CFC and HCFC free.
- No halogenated compounds.



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FENOSOL™ TECHNICAL DATA

Properties	Units	FENOSOL Standard	Values [Mini ; Maxi]	Measurement Method
Nominal density	kg/ m ³	200	[30 ; 700]	ISO 845
Compressive stress at 10% deformation	MPa	> 2	[0.1 ; 15]	ISO 604
Compressive stress at 50% deformation	MPa	> 3	[0.1 ; 50]	ISO 604
Thermal conductivity	W.m ⁻¹ .K ⁻¹	0.05	[0.02 ; 0.15]	ISO 8990
Specific heat	J.g ⁻¹ .K ⁻¹	1,3 à 20°C	-	-
Fire class	-	M1	M1	NF P 92-501
Fume class	-	F1	F1	NFX 10-702
Dimensional stability	%	0.1	[-0.5 ; +0.5]	ISO 2796
Temperature range in use	°C	-180 à +120	-	-
Closed cells	%	13	[5 ; 95]	ISO 4590
Carbon content	%	> 65	-	-
Hydrogen content	%	> 7.2	-	-
Chlorine content	ppm	< 20	-	-
Water content	%	>20%	[2 ; 25%]	

The above figures have been obtained through laboratory tests. They may vary according to manufacturing and on-site conditions.