PAKAN ATIYE NANODANESH
(PANDA)

IRogel®

With 5 -10 mm thickness IRogel® is suitable for
High Temperature, CUI Defense, Petrochemicals, Cryogenic,
Power Generation, District Energy, LNG, Subsea, Buildings, etc.

HIGH PERFORMANCE FLEXIBLE INDUSTRIAL INSULATION FOR HIGH AND LOW TEMPERATURE APPLICATIONS

Maximum Aerogel Loaded Blanket

IRogel®

IRogel®

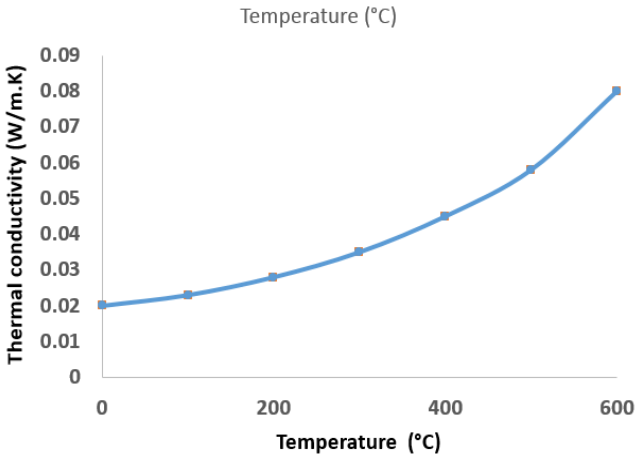
FLEXIBLE INSULATION FOR HIGH TEMPERATURES

IRogel® materials are flexible aerogel nanoporous insulation blankets designed for Different-temperature applications. The unique properties of very low thermal conductivity, high temperature resistance, good flexibility, and ease of use have made IRogel® essential for those seeking the ultimate in thermal protection.

Using nano technology, IRogel® materials combine a silica aerogel with reinforcing fibers to deliver superior thermal performance in an environmentally safe and nontoxic product.

IRogel® is an opacified aerogel blanket for effective blocking of the radiation component of heat transfer. It delivers excellent thermal insulation up to 1200ºF (650ºC) for applications including aerospace, transportation, industrial equipment, power generation, nuclear power plants, high-temperature thermal and fire protection.

5 – 12 mm flexible blanket



Advantages

Superior Thermal Performance
Up to ten times better thermal performance than competing insulation products. The maximum aerogel loaded blanket in the world

Minimum Weight and Thickness
Low thermal conductivity at a fraction of the thickness

Less Time and Labor to Install
Easily cut and conformed to complex shapes, tight curvatures, and spaces with restricted access

Physically Robust
Soft and flexible but with excellent spring back, IRogel® recovers its thermal performance even after compression events as high as 100 psi

Shipping and Warehousing Savings
Reduced material volume, high packing density, and low scrap rates can reduce logistics costs by a factor of six or more compared to rigid, pre-formed insulations

Simplified Inventory
Unlike rigid pre-forms such as pipe cover or board, the same IRogel® blanket can be kitted to fit any shape or design

Excellent Fire Protection
Equal to or better than other insulation materials, including mineral wool and calcium silicate

Hydrophobic Yet Breathable
IRogel® repels liquid water but allows vapor to pass through

Environmentally Safe
Landfill disposable, shot-free, with no respirable fiber content

Super Hydrophobic, IRogel

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Company: Industrial town, Zanjan, Iran
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IRogel®

ASTM C 1728, Type III, Grade 1A	Standard Specification for Flexible aerogel insulation	Compiles
ASTM C 165	Compressive Strength	Stress at 30% strain = 22.6 psi Stress at 50% strain = 82.7 psi Stress at 25% Strain = 26.6 psi
ASTM C 356	Linear Shrinkage Under Soaking Heat	< 1 % @ 650 °C
ASTM C 411	Hot Surface Performance	Passed
ASTM C 447	Estimation of Maximum Use Temperature	(650 °C)
ASTM C 592-04 (Section 11.11, Modified)	Heat and Vibration Aging	Passed
ASTM C 795	Insulation for Use Over Austenitic Stainless Steel	Passed
ASTM C 1101	Classifying the Flexibility of Mineral Fiber Blankets	Class: Resilient Flexible
ASTM C 1104	Water Vapor Sorption	1.8 % (By Weight)
ASTM C 1338	Fungal Resistance of Insulation Materials	Passed
ASTM C 1511	Liquid Water Retention After Submersion	< 2% (By Weight)
ASTM E 84	Surface Burning Characteristics	Flame Spread Index = 0 Smoke Develop Index = 0
ASTM EN 13501-1: 2017	Reaction to Fire Performance	Passed Euro class A2
ISO 1182- 1990	non- combustibility	Meets Criteria Outlined in ISO 1182-1990
BET	Pore diameter	20 – 30 nm
SEM	Nano structure	Nano porous
TEM	Particle size	2- 3 nm
Contact angle	Hydrophobicity	>140 ◦
ASTM C 167	Density	190 – 210 kg/m^3
ASTM	Mechanical Properties	
UL 1709	Rapid Rise Fire Tests of Protection Materials for Structural Steel	75 min → 20mm 180 min → 50mm 120 min → 30mm 210 min → 60mm 150 min → 40mm 240 min → 70mm
ASTM C 177	Thermal conductivity	20 ℃ → 0.021 w/m.K 200 ℃ → 0.04 w/m.K 400 ℃ → 0.054 w/m.K 600 ℃ → 0.079 w/m.K
Acoustic Insulation	Acoustic properties at different frequencies	100 Hz 440 Hz 1000 Hz 10000 Hz Intensity (db) 102.3 115.3 113.7 114.7 Reduction (db) 20.5 13.1 29.1 49.3

Flammability

IRogel® meets the requirements of Transportation, Aviation Regulations for Compartment Interiors, (60 Second Ignition Time with 0.0 seconds after flame).

Handling Characteristics

IRogel® can be cut using conventional textile cutting tools including scissors, electric scissors and razor knives. The material can be dusty and it is recommended gloves and dust mask be worn when handling material. See MSDS for complete health and safety information.

Effects of Moisture and Solvents

IRogel® series products are hydrophobic as produced. Exposures to 750ºF (400ºC) or above can degrade the hydrophobic properties It is not recommended to expose **IRogel®** products directly to most organic solvents.

Encapsulation

Encapsulation is recommended to protect the aerogel from harsh environments. In addition, encapsulation helps to contain the material, prevent contamination and assist in its attachment to a surface. Encapsulation can be done in numerous ways.

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