ThermoDyne

Excelflex ® Microporous Insulation

Excelflex® Insulation Systems

Excelflex® Insulation Systems are the flexible version of Thermo Dyne's microporous insulation product line. The superior thermal performance of Excelflex® insulation allows the maximum amount of thermal protection to be provided within minimum space and weight requirements. Excelflex® microporous insulation is a blend of ceramic powders and fibers combined to produce a high temperature material that provides excellent thermal stability, low thermal diffusivity and the lowest thermal conductivity. Excelflex® is specially formulated to block all three forms of heat transfer. Conduction is minimized through the use of a ceramic powder which intrinsically has low thermal conductivity. In addition, the powder is formed to create a porous structure, minimizing the energy conducted through the solid material. Convection is minimized by using a powder with an extremely fine particle size which forms void spaces too small for convection currents to exist. Radiation increasingly becomes the dominant mode of heat transfer as application temperature increases. The infrared heat transmission through the insulation is reduced to the lowest levels possible with the addition of special opacifiers in the Excelflex ® formulation.

Materials of Construction

Excelflex ® Insulation Systems are composed of a high temperature core material which is encapsulated between two layers of high temperature cloth. This assembly is then compressed into a uniform thickness and density and then sewn to form the finished composite. The stitching provides structure, strength, and consistent distribution of the core material, while allowing the insulation to be flexible enough to be wrapped around irregular shapes. The Excelflex ® core material is an 1800ºF continuous use material. Excelflex® Insulation Systems are supplied with a standard 1400ºF S-Glass textile cloth covering, which provides the thermal stability necessary for most applications. Other textiles are available upon request which provide protection from 500ºF to 2300ºF. Thread material selection is based upon the application's temperature requirements. Excelflex ® is available in standard (16pcf) and lightweight (10pcf) densities and thicknesses from 1/8" to 1/2".

Excelflex ® Insulation Systems Advantages

With a microporous core and versatile composite options, Excelflex® offers several major advantages over other insulation materials in high performance applications.

Lowest Thermal Conductivity

Microporous ceramic powders and fibers work together to form a material with the lowest possible thermal conductivity, thermal diffusivity and heat storage. This enables Excelflex® to provide the maximum thermal protection utilizing the least amount of weight and space.

Lightweight and Saves Space

Low core densities result in mass savings for weight sensitive applications commonly encountered in the Aerospace industry. In applications where space is a problem, low thermal conductivity means less material thickness is required to achieve the desired insulation value saving space.

High Temperature Capability

Excelflex ® can be manufactured to meet high temperature requirements including intermittent exposure up to 2300ºF.

Flexible

The quilted stitch pattern provides strength, yet allows the composite to remain flexible enough to insulate irregular shapes.

Easy Fabrication

Complex shapes can be easily made by cutting. Excelflex ® with a sharp knife, razor, die or laser. Edges can be sealed by sewing on an edge strip of similar textile used on the composite.

Typical Characteristics

Core Density 8lbs/cuft, 10 lbs/cuft, 12lbs/cuft, 14lbs/cuft,16 lbs/cuft

Thickness and Densities
8pcf: 3/16”, 1/4”, 3/8”, 1/2”
10pcf: 3/16”, 1/4", 3/8", 1/2"
16pcf: 1/8", 3/16", 1/4", 3/8", 1/2"

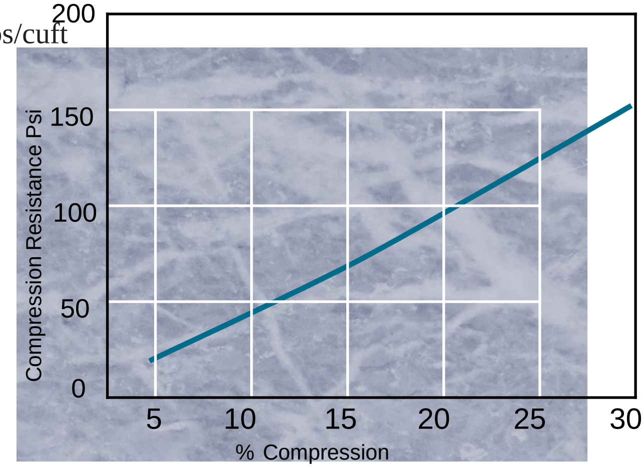
Textile Covering

Standard: S-Glass	(1400ºF)
Available: E-Glass	(1200ºF)
Silica	(1800ºF)
Quartz	(2000ºF)

Stitching Standard 1" Square; lock stitched
Available: Parallel stitched

Size Standard 36“ x 36“ square lock stitched
36“ x 48" square lock stitched
36“ x 72" parallel lock stitched

Compression Data For 16 pcf



Thermal Conductivity Data (Btu - in/hr - ft 2 - ºF)*

Density = 8 lbs/ft 3

Mean Temp.	1/4"	3/8"	1/2"
400ºF	0.27	0.27	0.25
600ºF	0.33	0.33	0.32
800ºF	0.38	0.38	0.38
1000ºF	0.48	0.46	0.44
1200ºF	0.58	0.57	0.55

Density = 10 lbs/ft 3

Mean Temp.	1/4"	3/8"	1/2"
400ºF	0.24	0.23	0.22
600ºF	0.29	0.28	0.27
800ºF	0.36	0.35	0.33
1000ºF	0.44	0.42	0.40
1200ºF	0.55	0.52	0.50

Density = 16 lbs/ft 3

Mean Temp.	1/8"	3/16"	1/4"	3/8"	1/2"
400ºF	0.25	0.24	0.24	0.22	0.22
600ºF	0.27	0.27	0.26	0.25	0.25
800ºF	0.33	0.31	0.31	0.29	0.28
1000ºF	0.39	0.37	0.37	0.35	0.33
1200ºF	0.46	0.45	0.45	0.43	0.41

Standard Part Numbers for S glass both sides Square Stitched 16 pcf

10383-125, 10383-187
10383-250 NSN 1660-01-618-8180
10383-375, 10383-500

Standard Part Numbers for S glass both sides Square Stitched 10 pcf

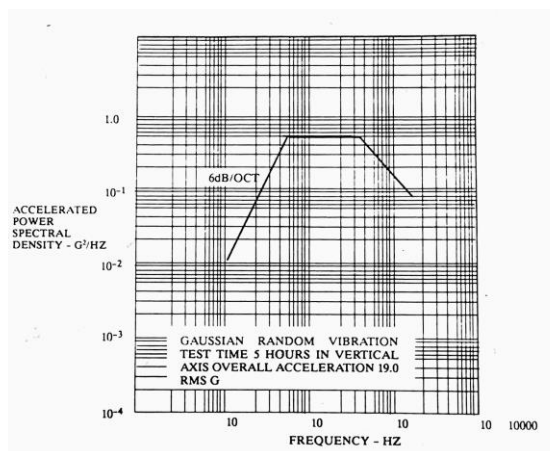
10386-187, 10386-250
10386-375, 10386-500

Standard Part Numbers for S glass both sides Square Stitched 8 pcf

12166-187, 12166-250
12166-375, 12166-500

**NOTE: All thermal conductivity values have been measured in accordance with ASTM Test Procedure C-177. Curve fitting and calculations have been used to fill in gaps to keep the data clean. When comparing similar data, it is advisable to check the validity of all thermal conductivity values and ensure the resulting heat flow calculations are based on the same condition factors. Variations in any of these factors will result in significant differences in the calculated data.*

**NOTE: The materials listed here have been subject to and survived successfully the vibration curve below. The materials are very vibration resistant. The materials listed here can withstand other vibration scenarios.*





Aerospace/Defense

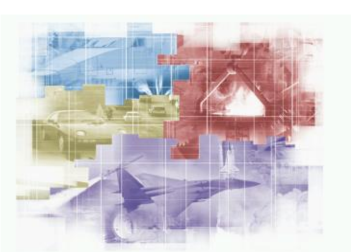
Engine nacelles
Auxiliary power units
Fire walls
Struts and cowlings

Industrial

Power Plants
Incinerators
Molten metal ladle backup
Glass feeder bowls

Commercial

Exhaust systems
Furnaces
Ovens
Night storage heaters



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