

Tuf-Skin® and Tuf-Skin® II
HVAC Equipment Liners

Description

Tuf-Skin® dual-density fiber glass blankets are the most widely used insulation for HVAC equipment applications. The combination of a high-density skin and low-density core provides high acoustical values in the high and low frequency ranges normally encountered in appliances and HVAC equipment.

Tuf-Skin® II is the cost-effective alternative to original Tuf-Skin for acoustical and thermal applications in HVAC equipment and appliances. With the same proven characteristics as Tuf-Skin, its dual-density construction enhances sound absorption at high and low frequencies.

Applications

Both insulations provide effective thermal and acoustical control in air conditioning and heating equipment and in other appliances and equipment required. These products are recommended for operating temperatures up to 250°F (121°C).

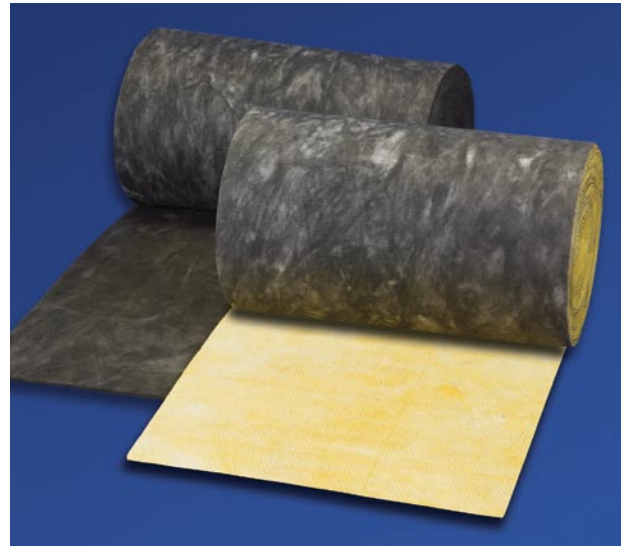
Advantages

Tuf-Skin and Tuf-Skin II have high-density skins and light-density cores which provide high acoustical values in the intensity and frequency ranges normally encountered in appliances and HVAC equipment. The porosity and inherent structure of the flame-attenuated glass fiber blankets are highly effective in reducing thermal transfer. The inherent rigidity of these products eases installation. In addition to the thermal and acoustical properties, both insulations readily withstand damage from mechanical abrasion during assembly and from in-service air erosion.

These products are easily cut to size or shape with a knife, steel rule die, or shears. They can be firmly bonded to metals, plastic, or other materials with commercial adhesives or mechanical fastening devices.

Available Forms

Both insulations are furnished with black skin. Tuf-Skin has an amber or black fiber glass core, and Tuf-Skin II has an amber core.



Custom Fabrication

In addition to standard rolls, a Johns Manville Approved Fabricator can provide specially cut shapes and pieces to particular customer specifications.

Fabricated Products

Tuf-Skin and Tuf-Skin II Equipment Insulations are manufactured to specific customer width requirements. Contact your Johns Manville sales representative for limitations. Die-cut or fabricated pieces are generally supplied by one of the strategically located Johns Manville fabricators which is specially equipped to provide prompt service to manufacturers in their area.

Applications

- Residential and Commercial Furnaces
- Air Conditioners
- Mixing Boxes

Properties

- Excellent High and Low Frequency Acoustical Performance
- Good Thermal Performance
- Easy to Handle
- Easy to Install

Specifications

Temperature Limit	250°F (121°C)
Fire Hazard Classification	25/50 (per ASTM E 84 and UL 723 and CAN/ULC S102 - M88). Meets NFPA 90A and 90B.
Maximum Air Velocity	3,600 fpm (18.3 m/sec). Tested at two and one-half times (9,000 fpm [45.7 m/sec]) the maximum recommended service velocity. They meet the erosion requirements of UL 181.
ASTM C 1071	Conforms to the physical properties and requirements.

Standard Thicknesses and Roll Lengths

Description	Available Thicknesses		Available Roll Lengths	
	in.	mm	ft	m
Tuf-Skin	½	13	150	45.7
Skin: Black	¾	19	135	41.2
Core: Black or Amber	1	25	100	30.5
	2	51	35	10.7
Tuf-Skin II	½	13	150	45.7
Skin: Black	¾	19	135	41.2
Core: Amber	1	25	100	30.5

Tuf-Skin® and Tuf-Skin II

HVAC Equipment Liners

Tuf-Skin - Thermal Conductance (C)*

Thickness		75°F (24°C) Mean Temperature	
in.	mm	Btu/(hr•ft ² •°F)	W/m ² •°C
½	13	0.48	2.72
¾	19	0.31	1.76
1	25	0.24	1.36
1½	38	0.17	0.96
2	51	0.13	0.74

Tuf-Skin II - Thermal Conductance (C)*

Thickness		75°F (24°C) Mean Temperature	
in.	mm	Btu/(hr•ft ² •°F)	W/m ² •°C
½	13	0.52	2.95
¾	19	0.36	2.04
1	25	0.26	1.47
1½	38	0.18	1.02

* Since Tuf-Skin and Tuf-Skin II Insulations are dual-density materials, thermal conductivity (k) cannot be used. It applies only to homogeneous materials. The effective thermal conductivity of ½" (13 mm) Tuf-Skin II is 0.26 and ½" (13 mm) Tuf-Skin is 0.24.

Tuf-Skin – Acoustical Performance

Type "A" Mounting, Sound Absorption Coefficients*

Thicknesses		Frequency (Hz)						
in.	mm	125	250	500	1000	2000	4000	NRC**
½	13	0.05	0.17	0.34	0.51	0.68	0.84	0.45
¾	19	0.02	0.22	0.43	0.48	0.70	0.77	0.50
1	25	0.10	0.32	0.64	0.84	0.98	1.01	0.70
1½	38	0.16	0.54	0.92	1.05	1.09	1.00	0.90
2	51	0.19	0.71	1.02	1.14	1.07	1.05	1.00

* Tested in accordance with ASTM C 423, Type "A" mounting per ASTM E 795
** Noise Reduction Coefficient

Tuf-Skin II – Acoustical Performance

Type "A" Mounting, Sound Absorption Coefficients*

Thicknesses		Frequency (Hz)						
in.	mm	125	250	500	1000	2000	4000	NRC**
½	13	0.06	0.15	0.32	0.51	0.67	0.88	0.45
¾	19	0.06	0.22	0.47	0.68	0.85	0.97	0.55
1	25	0.10	0.32	0.60	0.83	0.94	1.00	0.65
1½	38	0.17	0.55	0.91	1.06	1.09	1.00	0.90

* Tested in accordance with ASTM C 423, Type "A" mounting per ASTM E 795
** Noise Reduction Coefficient



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Technical Information

(800) 458-7198

The physical and chemical properties of Tuf-Skin® and Tuf-Skin® II HVAC Equipment Liner Insulations listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you to assure current information. **All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions including Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions, Limited Warranty and Limitation of Remedy, and information on other Johns Manville thermal insulations and systems, call (800) 654-3103.**