



**Johns Manville**

OEM Insulations

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

**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 thermal/acoustical properties, both insulations readily withstand damage from mechanical abrasion during assembly and from air erosion in service.

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.



### **Applications:**

- **Residential and Commercial Furnaces**
- **Air Conditioners**
- **Mixing Boxes**

### **Insulation Properties:**

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

# Tuf-Skin® and Tuf-Skin II

## HVAC Equipment Liners

### Specifications

#### Temperature Limit:

250° F (121° C)

#### Fire Hazard Classification:

25/50 (per ASTM E 84 and UL 723 and CAN/ULC S102 - M88). Labels supplied when requested on order. Meets NFPA 90A and 90B.

#### Maximum Air Velocity:

3,600 fpm (1,097 mpm) for Tuf-Skin and Tuf-Skin II Equipment Liners. Both are tested at two and one-half times (9,000 fpm) (2,743 mpm) the maximum recommended service velocity. They meet the erosion requirements of UL 181.

#### ASTM C 1071:

Both Tuf-Skin and Tuf Skin II have been tested and conform to the physical properties and requirements of ASTM C 1071.

#### 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.

#### For Information

Write Johns Manville Product Information Center, P.O. Box 5108, Denver, Colorado 80217-5108, or call toll-free 1-800-654-3103 (outside Colorado); (303) 978-4900 (inside Colorado).

#### Limited Warranty

All Johns Manville products are sold subject to Johns Manville's Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville Limited Warranty and Limitation of Remedy, write to:

Johns Manville Product Information Center  
P.O. Box 5108  
Denver, CO 80217-5108

or call toll free: 1-800-654-3103 or contact your local Johns Manville sales representative.

### Tuf-Skin - Thermal Conductance (C)\*

Thicknesses		Mean Temp. @ 75° F (23° C)	
inches	mm	Btu/(hr. • ft. <sup>2</sup> • °F)	W/m <sup>2</sup> K
1/2	13	.48	2.7
3/4	19	.31	1.8
1	25	.24	1.4
1 1/2	38	.17	.97
2	51	.13	.74

### Tuf-Skin II - Thermal Conductance (C)\*

Thicknesses		Mean Temp. @ 75° F (23° C)	
inches	mm	Btu/(hr. • ft. <sup>2</sup> • °F)	W/m <sup>2</sup> K
1/2	13	.52	3.0
3/4	19	.36	2.0
1	25	.26	1.5
1 1/2	38	.18	1.0

\* 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 1/2" (13mm) Tuf-Skin II is .26 and 1/2" (13 mm) Tuf-Skin is .24.

### Tuf-Skin - Acoustical Performance

Type "A" Mounting Sound Absorption Coefficients\*

Thicknesses		Frequency (Hz)						
inches	mm	125	250	500	1000	2000	4000	NRC**
1/2	13	.05	.17	.34	.51	.68	.84	.45
3/4	19	.02	.22	.43	.48	.70	.77	.50
1	25	.10	.32	.64	.84	.98	1.01	.70
1 1/2	38	.16	.54	.92	1.05	1.09	1.00	.90
2	51	.19	.71	1.02	1.14	1.07	1.05	1.00

### Tuf-Skin II - Acoustical Performance

Type "A" Mounting Sound Absorption Coefficients\*

Thicknesses		Frequency (Hz)						
inches	mm	125	250	500	1000	2000	4000	NRC**
1/2	13	.07	.17	.33	.52	.70	.87	.45
3/4	19	.06	.22	.47	.68	.85	.97	.55
1	25	.10	.32	.60	.83	.94	1.00	.65
1 1/2	38	.17	.55	.91	1.06	1.09	1.00	.90

\* Tested in accordance with ASTM C 423-84a and ASTM E 795-83

\*\* Noise Reduction Coefficient



### Johns Manville OEM Insulations Division

P.O. Box 5108  
Denver, CO 80217-5108  
Internet: <http://www.jm.com>

The physical and chemical properties of Johns Manville Tuf-Skin and Tuf-Skin II represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. The data is supplied as a technical service and is subject to change without notice. Check with your Johns Manville representative to obtain current information.