

Performance-Based Duct Liner Selection

The performance-based ASTM C 1071 duct liner standard has removed the guesswork from the selection of duct system liner insulations. Historically, insulation thickness and density were the primary selection criteria. If all liners perform equally, as is frequently assumed, it stands to reason that from a baseline thickness and density, increasing one or both of these characteristics will provide an increase in thermal or acoustical performance.

But all liners are not equal. Because of differences in manufacturing processes and airstream surface treatments, density has little relevance to actual duct liner performance. That's why the insulation industry collaborated with ASTM to produce the C 1071 Standard Specification.

Benefits of ASTM C 1071

Because of the differences in duct liner manufacturing processes, density does not equal performance. Density specifications typically increase material cost without addressing the acoustical and thermal performance requirements. ASTM C 1071 gives the engineer or owner the ability to:

- Specify acoustical performance requirements
- Specify thermal performance requirements
- Specify other key duct liner parameters, as indicated below

ASTM C 1071 - Not Just Acoustics

There's much more to ASTM C 1071 than acoustics. It's a comprehensive duct lining performance specification, and covers these important considerations in addition to acoustical performance:

- Thermal conductivity (ASTM C 518)
- Temperature resistance (ASTM C 411)
- Corrosiveness (ASTM C 665)
- Surface burning characteristics (ASTM E 84)
- Fungi resistance (ASTM C 1338)
- Fiber erosion resistance (ASTM C 1071)
- Odor emissions (ASTM C 1304)
- Moisture vapor sorption (ASTM C 1104)

Type I and Type II Liner Classification

ASTM C 1071 references Type I and Type II products. Type I refers to blanket, or flexible duct liner, supplied in roll form. Type II refers to board duct or plenum liner supplied in sheet form. Johns Manville liners fall into these categories as follows:

- Type I Linacoustic® RC; Permacote® Linacoustic® HP
- Type II Permacote® Linacoustic® R-300

Fact Sheet

ASTM C 1071 Update

Linacoustic Products Exceed Minimum ASTM C 1071 Acoustical Standards

As a consensus standard, the performance requirements in ASTM C 1071 were established to include the lowest-performing, commercially available duct liner materials. Acoustical performance of the liners is determined in accordance with ASTM C 423 and ASTM E 795, using a Type "A" mounting. Note that older publications may list liner acoustical performance on obsolete F-25 or alternate mountings, which elevate results. To ensure accurate performance comparisons, confirm that mountings and test methods comply with ASTM C 1071.

As the following table indicates, JM Linacoustic products notably exceed the minimum NRC values:

Type	Thickness	Minimum NRC	Linacoustic RC NRC	Permacote Linacoustic NRC
I	1"	.45	.70	.75 (HP)
II	1"	.55	—	.75 (R-300)
	1.5"	.75	—	.90 (R-300)
	2"	.90	—	1.00 (R-300)

ASTM C 1071 Thermal Performance Standards

Minimum thermal performance requirements were also established within ASTM C 1071. The thermal conductivity is determined in accordance with ASTM C 518 at 75°F mean temperature. R-Value and Conductance are calculated from the thermal conductivity "k" factor.

Again, JM Linacoustic products outperform the requirements by a wide margin:

Type	Thickness	Thermal Conductivity ("k") @ 75°F Mean Temperature		
		Minimum Conductivity	Linacoustic RC	Permacote Linacoustic
I	1"	.31	.24	.24 (HP)
II	1"	.27	—	.23 (R-300)

Type	Thickness	R-Value ("R") @ 75°F Mean Temperature		
		Comparable R-Value	Linacoustic RC	Permacote Linacoustic
I	1"	3.2	4.2	4.3 (HP)
II	1"	3.7	—	4.3 (R-300)

Where to Use Permacote Linacoustic HP

JM's HP liner was designed to maximize performance without the drawbacks of added thickness. With its increased acoustical and thermal performance, HP is readily substituted for 1.5" thick textile liners of varying production density. HP helps control cost by eliminating the need to increase liner thickness and metal duct size.



717 17th St.
Denver, CO 80202
(800) 654-3103
specJM.com

North American Sales Offices, Insulation Systems

Eastern Region
P.O. Box 158
Defiance, OH 43512
(800) 334-2399
Fax: (419) 784-7866

Western Region & Canada
P.O. Box 5108
Denver, CO 80217
(800) 368-4431
Fax: (303) 978-4661

The physical and chemical properties of Linacoustic® Duct Liner Products 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.**