



Insulation  
&  
Liner

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**Air Handling Systems**

**Linacoustic RC™**

*Fiber Glass Duct Liner With Reinforced Coating System*

**Description**

Linacoustic RC is a flexible duct liner insulation made from strong, glass fibers bonded with a thermosetting resin. The airstream surface is protected with JM's exclusive Reinforced Coating System, which combines our state-of-the-art Permacote® acrylic coating with a flexible glass cloth reinforcement.

**Factory-Applied Edge Coating**

Edge coating is factory applied to the edges of the liner core, assuring coverage of the leading edges per NAIMA/SMACNA requirements. Shop fabrication cuts may be coated with the SuperSeal® Duct Butter and Edge Treatment products (refer to publication AHS-202).

**Uses**

Linacoustic RC is specifically designed for lining sheet metal ducts in air conditioning, heating and ventilating systems, providing superior acoustical and thermal performance.

**Advantages**

**Improves Indoor Building Environment.** Linacoustic RC improves indoor environmental quality by helping to control both temperature and sound.

**Resistant to Dust and Dirt.** The tough, acrylic polymer Permacote coating helps guard against the incursion of dust or dirt into the substrate, minimizing the potential for biological growth.

**Will Not Support Microbial Growth.** Permacote coating is formulated with an immobilized, EPA-registered, protective agent to protect the coating from potential growth of fungus and bacteria.

Linacoustic RC duct liner meets all requirements of ASTM C 1071 for fungi and bacterial resistance. Tests were conducted in accordance with ASTM C 1338 and ASTM G 21 (fungi testing) and ASTM G 22 (bacteria resistance testing). Detailed information is available in Johns Manville fact sheet HSE-103FS.

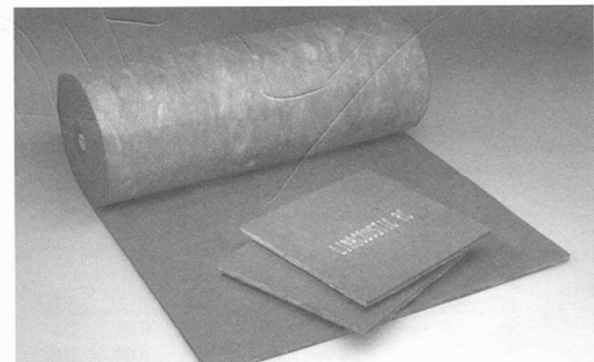
Note: As with any type of surface, microbial growth may occur in accumulated duct system dirt, given certain conditions. This risk is minimized with proper design, filtration, maintenance and operation of the HVAC system.

**GREENGUARD®.** This certification is proof that the product meets the Environmental Institute's indoor air quality standards for VOCs.



**Cleanability.** If HVAC system cleaning is required, the Reinforced Coating airstream surface may be cleaned with industry-recognized dry methods. See the North American Insulation Manufacturers Association (NAIMA) "Cleaning Fibrous Glass Insulated Air Duct Systems."

**Minimizes Pre-Installation Damage.** Linacoustic RC's Reinforced Coating System is highly resistant to damage that can occur during in-shop handling, fabrication, jobsite shipping, and installation.



**Highly Resistant to Water.** The Reinforced Coating surface provides superior resistance to penetration of incidental water into the fiber glass wool core.

**Easy to Fabricate.** Linacoustic RC is light in weight and easy to handle. Clean, even edges can be accurately cut with regular shop tools.

**Available Forms**

Thickness	(in)	(mm)
	1/2	13
	1	25
	1 1/2	38
	2	51
Roll Width*	(in)	(mm)
	34 to 36	864 to 914
	44 to 48	1118 to 1219
	56 to 60	1422 to 1524
	66 to 72	1676 to 1829
Roll Length**	(lineal feet)	(lineal meters)
	50	15
	100	31
	150	46
	200	61

\*Available in 1/4" (6.4 mm) increments. \*\*Check with plant for availability.

**Performance Limits**

**Maximum Air Velocity** 6,000 fpm (30.5 m/sec).

**Maximum Operating Temperature** 250°F (121°C)

**Water Repellency**

Per Cent Mass Gain (JM 436-1006) 6.2% (avg.)

INDA IST 80.6-92 ≥ 6

**Installation**

Linacoustic RC installation must be performed in accordance with the requirements of the NAIMA Fibrous Glass Duct Liner Standard, or SMACNA HVAC Duct Construction Standard. All transverse edges, or any edges exposed to airflow, must be coated with an approved duct liner coating material, such as Johns Manville SuperSeal® products.

**1. PRODUCT NAME**  
ToughGard™ Duct Liner

**2. MANUFACTURER**  
Certainteed Corporation  
P.O. Box 860  
Valley Forge, PA 19482-0105  
Phone (610) 341-7000  
(800) 233-8990  
Fax: (610) 341-7571  
Fax-On-Demand: (800) 947-0057  
Website: [www.certainteed.com](http://www.certainteed.com)

**3. PRODUCT DESCRIPTION**

**Basic Use:** ToughGard™ Duct Liner is used primarily as acoustical liner in HVAC sheet metal ducts to absorb unwanted crosstalk, equipment and air rush noise. It also helps improve the energy efficiency of the system by reducing heat gain or loss. Plus, duct liner helps minimize moisture problems due to condensation.

**Benefits:** tough and durable product is a cost-effective alternative to “double wall” metal duct systems. In addition, it features a fully protected air stream surface that resists dust, dirt and microbial growth.

**Composition and Materials:** Composed primarily of long, textile-type glass fibers firmly bonded together with a thermosetting resin and overlaid with an extremely tough and durable fire-resistant black composite air stream surface.

**Sizes:** For available sizes, see the table on the next page.

**Limitations:** The product should be kept clean and dry from the time of manufacture through job site installation and system operation.

**4. TECHNICAL DATA**

**Physical Properties:**

**Operating Limits:**

- Temperature: (ASTM C 411) Max. 250°F (121°C)
  - Air Velocity: (ASTM C 1071) Max. 6000 fpm (30.5 m/s)
  - Fire Resistance:**
    - Surface Burning Characteristics: (UL 723 and ASTM E 84)
      - Max. Flame Spread Index; 25
      - Max. Smoke Developed Index; 50
    - Water Vapor Sorption: (ASTM C 1104) <3% by weight
    - Corrosion Resistance: (ASTM C 665) Pass
    - Fungi Resistance: (ASTM G 22) No Growth
    - Limited Combustible: (NFPA 259) <3500 Btu/lb
  - Applicable Standards:**
    - ASTM 1071, Type II insulation
- Thermal Performance:** See table below.



THERMAL PERFORMANCE								
Product			K-Value		C-Value		R-Value	
Type	Thickness		Btu • in/ (h• ft. <sup>2</sup> •°F)	W/ (m• °C)	Btu • in/ (h• ft. <sup>2</sup> •°F)	W/ (m• °C)	(h• ft. <sup>2</sup> •°F)/ Btu	(m <sup>2</sup> •°C) /W
	in	mm						
150	1	25	0.28	0.040	0.28	1.59	3.6	0.63
	1½	38			0.19	1.06	5.4	0.94
	2	51			0.14	0.80	7.1	1.26
200	½	13	0.26	0.037	0.52	2.95	1.9	0.34
	1	25	0.27	0.039	0.27	1.53	3.7	0.65
	1½	38			0.18	1.02	5.6	0.98
	2	51			0.14	0.77	7.4	1.30
½	13	0.24			0.035	0.48	2.73	2.1
1	25		0.24	1.36		4.2	0.73	
1½	38		0.16	0.91		6.2	1.10	
2	51		0.12	0.68		8.3	1.47	

Thermal conductance (C) and resistance (R) values are derived from the material thermal conductivity (k) value  
Tested in accordance with ASTM C 518 and/or ASTM C 177 at 75° F (24° C) mean temperature.

**5. INSTALLATION**

Installation procedures and techniques shall be in accordance with the requirements of the NAIMMA Fibrous Glass Liner Standard or the SMACNA HVAC Duct Construction Standard and the project specifications.

**6. AVAILABILITY AND COST**

Manufactured and sold throughout the United States and Canada. For availability and cost, contact your local distributor or call CertainTeed in Valley Forge, PA at (800) 233-8990.

**7. WARRANTY**

Inasmuch as CertainTeed has no control over installation design, installation workmanship, accessory materials, or conditions of applications, CertainTeed does not warrant the performance or results of any installation containing its products.

**8. MAINTENANCE**

An inspection and preventative maintenance program for the HVAC system is recommended to ensure optimum performance.

**9. TECHNICAL SERVICES**

Technical assistance can be obtained either from the local CertainTeed sales representative, or by calling Technical Services in Valley Forge, PA, (800) 233-8990.



When Installed as suggested in the Energy Star insulation Guide, this product can save energy.  
Ask for the insulation Guide or call 1-888-STAR-YES.

ACOUSTICAL PERFORMANCE									
Product		Absorption Coefficients @ Octave Band Frequencies (Hz)							
Type	Thickness		125	250	500	1000	2000	4000	NRC
	in.	mm							
150	1	25	0.10	0.28	0.50	0.70	0.82	0.83	0.60
	1½	38	0.20	0.40	0.71	0.86	0.91	0.85	0.70
	2	51	0.22	0.49	0.83	0.89	0.89	0.91	0.80
200	½	13	0.04	0.10	0.24	0.41	0.56	0.73	0.35
	1	25	0.10	0.29	0.53	0.72	0.83	0.84	0.60
	1½	38	0.20	0.42	0.80	0.93	0.93	0.88	0.75
300	2	51	0.24	0.57	0.90	0.95	0.95	0.96	0.85
	½	13	0.05	0.12	0.29	0.51	0.68	0.80	0.40
	1	25	0.05	0.25	0.57	0.78	0.87	0.89	0.60
	1½	38	0.20	0.46	0.82	0.94	0.95	0.91	0.80
	2	51	0.27	0.72	1.04	1.02	0.96	0.92	0.95

Sound absorption tested in accordance with ASTM C 423 using Type A mounting per ASTM E 795.

AVAILABLE SIZES							
PRODUCT TYPES		THICKNESS		LENGTH		WIDTH	
ToughGard	ASTM C 1071	In.	mm	ft.	m	in.	mm
150 Density 1.5lb/ft³ (2kg/m³)	Type I Roll Form	1	25	100	30.5	34-36 46-48 56-60 Available in ¼" increments	864-914 1168-1219 1422-1829 Available in ½" increments
		1½	38				
		2	51				
½		13					
1		25					
1½		38					
300 Density 3.0 pcf (48 kg/m³)		½	13	50	15.2		
		1	25				

## RA Series Appliance Insulation

### 1. PRODUCT DESCRIPTION

Fiberglas® Type RA Series Appliance Insulation products are lightweight yellow blankets of glass fibers bonded with a thermosetting resin with good handling characteristics and dimensional stability, offering superior cost performance. RA Insulation is easily installed.

### 2. FEATURES AND BENEFITS

**Design Flexibility:** The RA product line offers a range of densities with thermal conductivity's to meet a variety of requirements.

**Dimensionally Stable:** The product resists thickness loss under operating conditions.

**Excellent Acoustical Properties:** The RA Series features excellent sound absorption performance.

**Non-corrosive:** Because the product is inorganic, it will not accelerate corrosion on copper, steel, or aluminum.

**Bacteria:** RA Series Insulation will not sustain nor promote bacteria or fungus.

### 3. USES

- Domestic refrigerators and freezers
- Commercial refrigerators and freezers
- Refrigerated appliance acoustical treatment
- Insulated panels
- Insulated shipping containers
- Vending machines
- Walk-in coolers
- Reach-in coolers
- Display cases
- Low temperature specialty equipment
- Water heaters

### 4. PROPERTIES

**Thermal Conductivity:** Fiberglass insulation materials are identified by a thermal conductivity rating. (RA-26, for example, has a conductivity of .260 BTU-in./(hr.)(sq.ft.)(F)at75°F temperature. This value is referred to as "k").



When Installed as suggested in the Energy Star® insulation Guide, this product can save energy. Ask for the insulation Guide or call 1-888-STAR-YES.

Batts Type	Nominal "k" (at 75 degrees mean)	Nominal Density
RA-26	.260	.95

**Compressive Strength:** - Batts ( 25 percent deformation at nominal thickness)

Type	Compressive Strength-pounds
RA-26	11

Rolls Type	Nominal "k" ( at 75 degree mean)	Nominal Density*
RA-26	.26	.95

\* Density value is nominal. Product control is on thermal conductivity.



## Product Data Sheet

### Availability and Thermal Performance

QuietR<sup>®</sup> Rotary Duct Liner is available in the following combinations of thicknesses and types.

Thickness		R-Value		Roll Length	
in	mm	(hr•ft <sup>2</sup> •°F)/Btu	(m <sup>2</sup> •°C)/W	ft	m
½	13	2.2	0.38	100	31
1	25	4.2	0.74	100	31
1½	38	6.3	1.11	50	15
2	51	8.0	1.41	50	15



### Description

QuietR<sup>®</sup> Rotary Duct Liner enhances indoor quality by absorbing noise within sheet metal ducts, and contributes to indoor comfort by lowering heat loss or gain through duct walls.

### Key Features

- Absorbs fan and air turbulence noise and reduces popping noises within sheet metal ducts.
- Outstanding thermal and acoustical performance.
- Bacterial and fungal growth resistant with an EPA registered biocide that protects the airstream surface from microbial growth.

### Product Applications/ Installation

All portions of duct designated to receive QuietR<sup>®</sup> Rotary Duct Liner shall be completely covered with duct liner, adhered to the sheet metal with 90% coverage of adhesive complying with ASTM C 916. Transverse joints shall be neatly butted and there shall be no interruptions or gaps. All transverse joints shall be edge-coated. Metal nosing on leading edges must be used where duct liner is preceded by unlined metal, and on all upstream edges when

### Typical Physical Properties

Property	Test Method	Value	
Operating Temperature	ASTM C411	250°F (121°C)	
Maximum Air Velocity	UL 181 Erosion Test ASTM C1071	6,000 fpm (30.5 m/sec)	
Water Vapor Sorption (by weight)	ASTM C1104	<3% at 120°F (49°C), 95% R.H.	
Fungi Resistance	ASTM C1338	Meets requirements	
Fungi Resistance	ASTM G21	Meets requirements	
Bacteria Resistance	ASTM G22	Meets requirements	
Corrosiveness <sup>1</sup>	ASTM C665 (Corrosiveness Test)	Will not cause corrosion greater than caused by sterile cotton on aluminum or steel*	
Thermal Conductivity k at 75°F (λ at 24°C mean)	ASTM C518	Btu•in/hr•ft <sup>2</sup> •°F	W/m•°C
R-2.2		0.23	0.034
R-4.2		0.24	0.035
R-6.3		0.24	0.035
R-8		0.24	0.035
Surface Burning Characteristics <sup>2</sup> Flame Spread Smoke Developed	ASTM E84, UL 723, CAN/ULC S102	25 50	

1. When wet, coated surfaces of QuietR<sup>®</sup> Rotary Duct Liner in contact with galvanized steel may cause discoloration of the sheet metal.
2. The surface burning characteristics of these products have been determined in accordance with UL 723 or CAN/ULC-S102. This standard should be used to measure and describe the properties of materials, products or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use. Values are reported to the nearest 5 rating. UL 723 and ASTM E84 are the same test methods.

velocity exceeds 4,000 fpm (20.3 m/s). The black mat faced surface of the duct liner shall face the airstream.

QuietR<sup>®</sup> Rotary Duct Liner shall also be secured with mechanical fasteners, either impact-driven or weld-secured, which shall compress the duct liner sufficiently to hold it firmly in place. For fastener spacing, see Figure 1.

Duct Liner shall be cut to assure overlapped and compressed

longitudinal corner joints. For details, refer to NAIMA Publication AH124, Fibrous Glass Duct Liner Standard.

Minor damage and small tears may be repaired by coating with adhesive.

After installation, and prior to occupancy, blow out duct system to remove any cutting scraps or foreign material remaining in the duct.

Installing two layers of material to meet a specific liner thickness is





## Product Data Sheet

not recommended. If the specification forces the use of multiple layers, the following steps must be taken:

1. Adhere bottom layer of duct liner to duct in normal manner.
2. Adhere top layer to bottom layer of liner using a minimum of 90% adhesive coverage.
3. Treat all leading edges with metal nosings to prevent separation of the two layers.
4. Use mechanical fasteners of the proper length for double layer.

### Application Limitations

Use of QuietR® Rotary Duct Liner is not recommended for the following applications:

- With wood or coal fired equipment, or equipment of any type which does not include automatic maximum temperature controls and where operating temperatures of 250°F (121°C) may be exceeded.
- In kitchen or fume exhaust ducts, or ducts conveying solids or corrosive gases
- In any application where the duct liner may come in direct contact with liquid water (such as cooling coils, humidifiers, and evaporative coolers) unless protected from the water source.
- Inside fire damper sleeves.

### Acoustic Performance

#### Tested Values—QuietR® Duct Liner

Sound absorption coefficients at octave band center frequencies (Hz)							
Thickness in (mm)	125	250	500	1000	2000	4000	NRC
½ (13)	0.04	0.12	0.39	0.64	0.78	0.74	0.50
1 (25)	0.05	0.30	0.60	0.87	0.98	1.05	0.70
1½ (38)	0.05	0.47	0.85	1.01	1.01	1.01	0.85
2 (51)	0.12	0.66	1.04	1.08	1.04	1.07	0.95

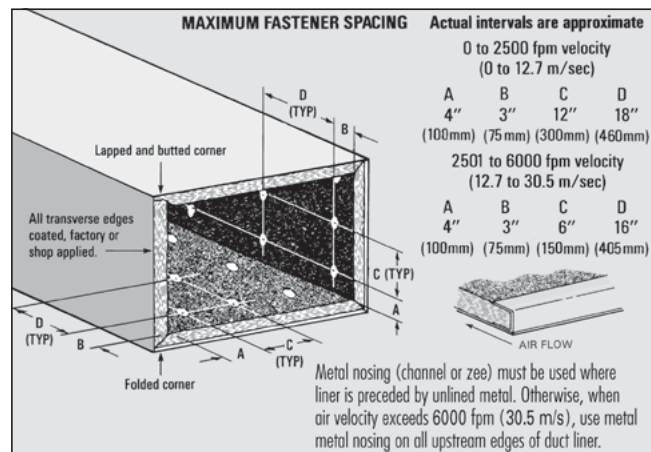
These data were collected using a limited sample size and are not absolute values. Reasonable tolerances must therefore be applied. All tests were conducted in accordance with ASTM C423, Mounting A (material placed against a solid backing such as a block wall). For more information, call your Owens Corning Representative.

#### Insertion Loss, dB per ft of Lined Duct

P/A, ft/ft²	1" Liner						2" Liner					
	Octave band center frequencies, Hz						Octave band center frequencies, Hz					
	125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
8	0.6	1.5	2.7	5.8	7.4	4.3	0.8	2.9	4.9	7.2	7.4	4.3
6	0.5	1.2	2.3	5.0	5.8	3.6	0.6	2.3	4.2	6.2	5.8	3.6
4	0.4	0.8	1.9	4.0	4.1	2.8	0.5	1.6	3.5	5.0	4.1	2.8
2	0.2	0.5	1.4	2.8	2.2	1.8	0.3	0.8	2.3	3.3	2.0	1.7
1	0.1	0.1	1.0	2.0	1.2	1.2	0.2	0.5	1.8	2.3	1.1	1.1

Duct Liner Insertion Loss—Data extracted from ASHRAE Handbook, HVAC Applications, Chapter 43, 1999  
P/A = duct perimeter, ft/duct cross sectional area (ft²). Example: 12" x 12", P/A = 4 (1/ft). For more information, call your Owens Corning Representative.

Figure 1





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- Immediately adjacent to high temperature heating coils without radiation protection.

### Standards, Code Compliance

- ASTM C1071, Type I, Flexible (replaces obsolete Federal Specification HH-I-545B.)
- NFPA 90A/90B
- ICC Compliant
- California Title 24
- SMACNA Application Standard for Duct Liners
- NAIMA Fibrous Glass Duct Liner Installation Standard
- Conforms to ASHRAE 62-2001

### Certifications and Sustainable Features of QuietR® Rotary Duct Liner

- Certified by SCS Global Services to contain a minimum of 53% recycled glass content, 31% pre-consumer and 22% post-consumer.
- Certified to meet indoor air quality standards under the stringent GREENGUARD Certification Program and the GREENGUARD Gold Certification\*.

\* Duct Liner up to and including 1" is GREENGUARD Gold Certified.

- Recognized by the GREENGUARD Environmental Institute as resistant or highly resistant to mold growth based on independent testing using GREENGUARD Test Method GGTM.P040 for microbial resistance.

### Environmental and Sustainability

Owens Corning is a worldwide leader in building material systems, insulation and composite solutions, delivering a broad range of high-quality products and services. Owens Corning is committed to driving sustainability by delivering solutions, transforming markets and enhancing lives. More information can be found at <http://sustainability.owenscorning.com>.