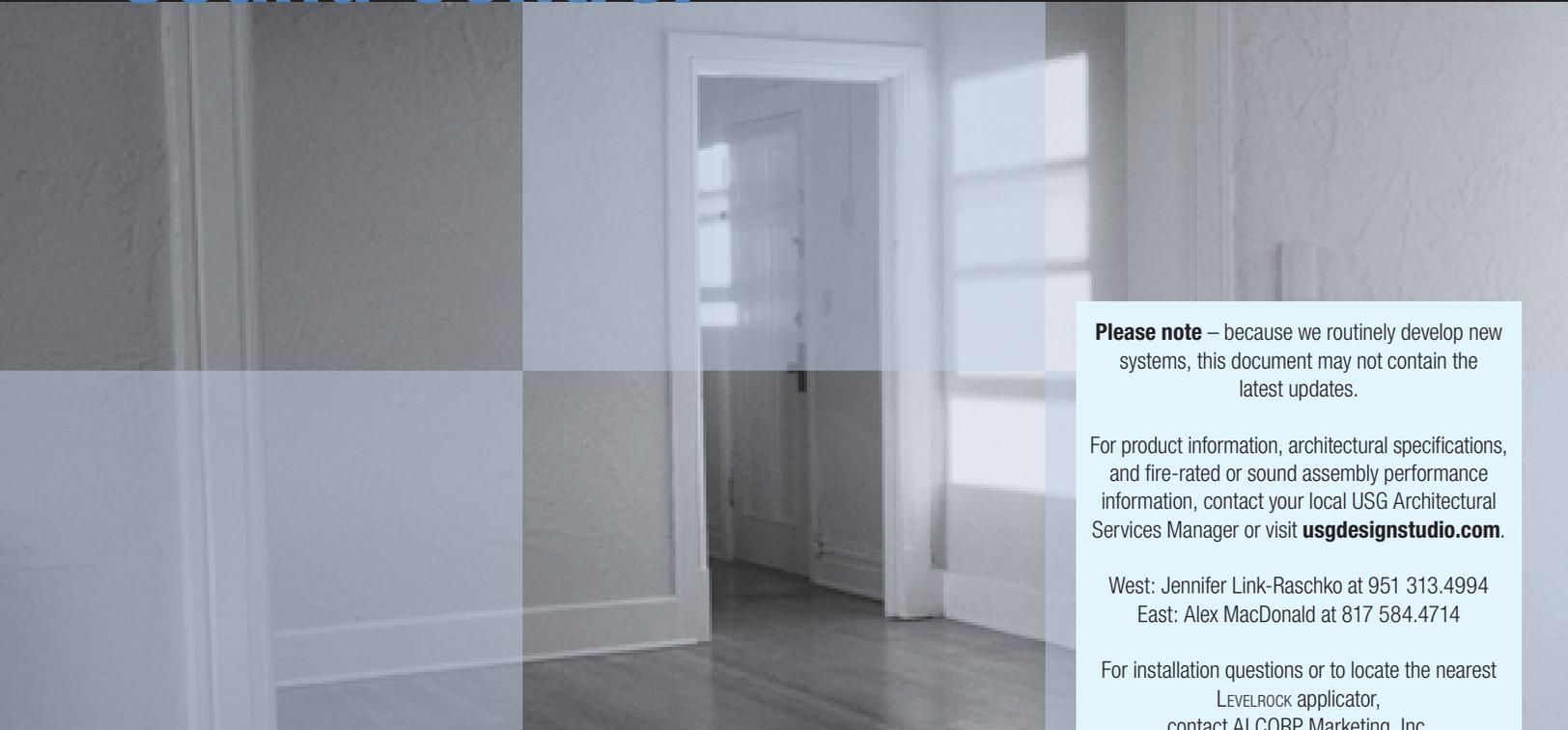


# Levelrock® Floor Underlayment Sound Solutions



How designing floor systems for sound control in multi-unit construction or renovation can improve the comfort of occupants without compromising the fire rating.

## Sound Control



**Please note** – because we routinely develop new systems, this document may not contain the latest updates.

For product information, architectural specifications, and fire-rated or sound assembly performance information, contact your local USG Architectural Services Manager or visit [usgdesignstudio.com](http://usgdesignstudio.com).

West: Jennifer Link-Raschko at 951 313.4994  
East: Alex MacDonald at 817 584.4714

For installation questions or to locate the nearest LEVELROCK applicator, contact ALCORP Marketing, Inc. at 817 329.1808.

As the use of hard floor surfaces such as tile, stone, marble, wood and engineered laminates becomes more popular in multi-unit buildings, floor-to-ceiling sound control becomes more important. Efficient and economical floor-to-ceiling sound control can make a significant impact on the comfort and desirability of a building.



# Protect

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## Privacy

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The character and code requirements of multi-unit construction are changing. Occupants in multifamily buildings want privacy within their own space and protection from noise in other units, especially in upscale dwellings. Institutional and commercial tenants expect privacy from occupants on other floors to enhance the productivity of employees.

### What's Important

Noise from neighboring apartments means unhappy tenants. Children, music and parties can all contribute to the problem. In offices, employees cannot function efficiently if they are constantly interrupted by noise from above or below. The bottom line for owners is that uncontrolled sound may make it difficult to sell or rent units in a building.

Protection from the intrusion of airborne, footfall and other impact sounds starts with floors that reduce the passage of sound. LEVELROCK® brand floor underlayment systems are tested for their ability to isolate sound from different sources, providing an affordable acoustical solution that can significantly improve the privacy and comfort in any space.

# Understand

## Sound

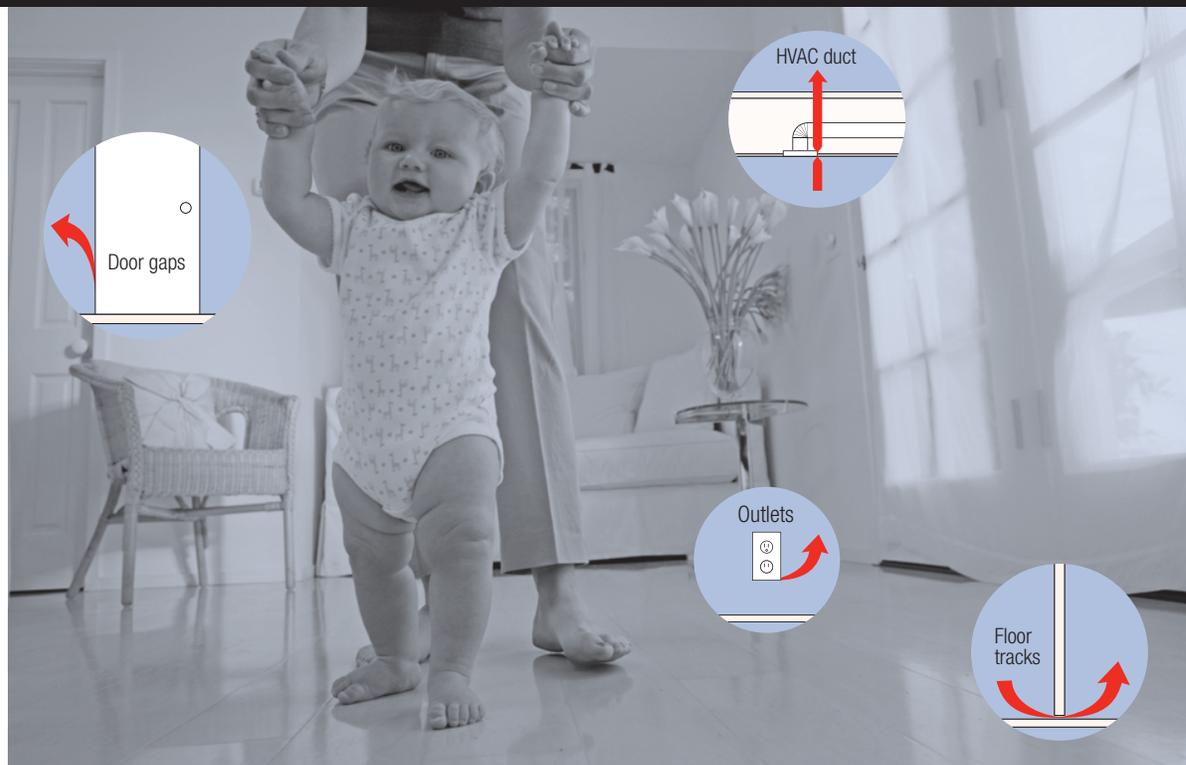
Designing or renovating buildings to minimize sound intrusion can be complicated. Sound waves are transmitted through the air and through structural elements such as walls and floors. Most building materials can absorb, reflect and dampen sound vibrations to some extent, but unless sound is completely controlled, the result will be less than ideal.

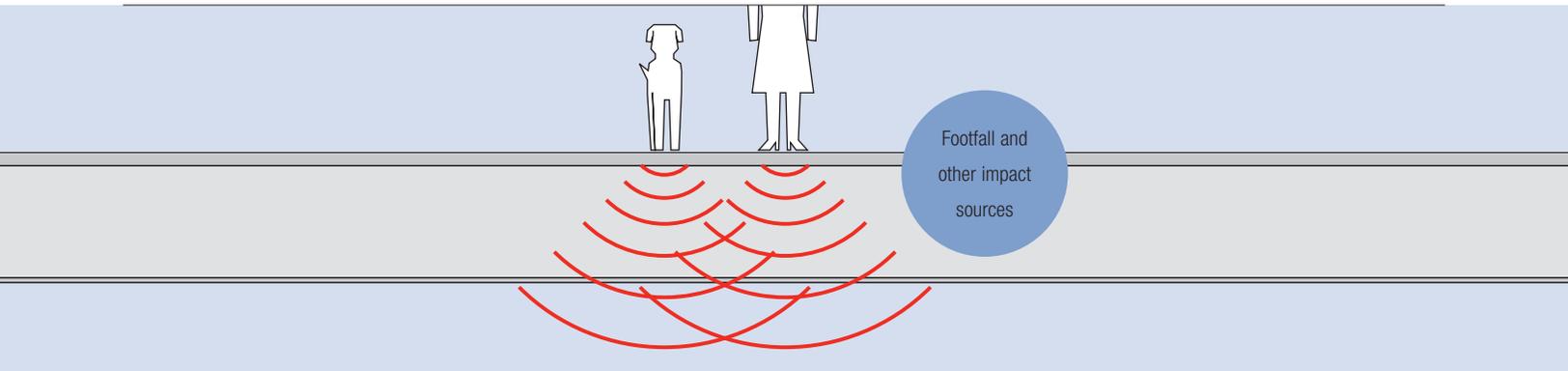
### What's Important

For critical surfaces such as floor/ceiling assemblies, it is essential to design systems that prevent the leakage of sound through the floor or ceiling. It is also important to prevent sound from traveling through small gaps and openings in floors and ceilings. To understand how sound control works, it is helpful to see how sound can be transmitted within a space.

### Flanking Paths

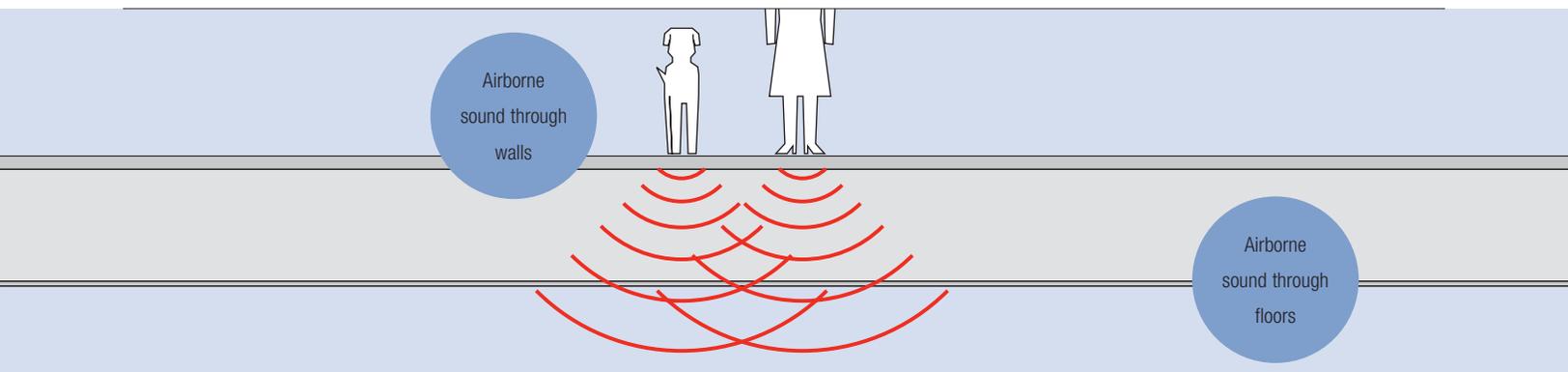
Small gaps and openings around doors, floor tracks, electrical boxes, and conduit and HVAC ducting allow sound to pass through if acoustical sealant is not used. Flanking paths are also referred to as "leaking paths."





**Impact Insulation Class (IIC)**

IIC measures the ability of a floor/ceiling assembly to isolate sound transmitted from footfall and other impact sources through the building structure. This reduces the intrusion of noise into rooms directly below. The minimum IBC (International Building Code) requirement is 50 IIC, per ASTM E492.



**Sound Transmission Class (STC)**

STC measures the ability of a wall or floor assembly to isolate airborne sound and prevent it from passing from one side to the other. The minimum IBC requirement is 50 STC, per ASTM E90.

# Minimize

## Sound

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Designing assemblies requires a fine balance between acoustic separation and fire protection—both elements are important to prevent owner and builder liability. Insulation thickness, placement in the cavity, and resilient channel spacing must all conform to the limits specified in the UL design.

### What's Important

It is critical not to sacrifice fire ratings for sound ratings. The best way to improve sound performance for various floor coverings and still achieve a fire rating is to use a sound reduction mat or board beneath the floor underlayment.

**USG offers a number of laboratory-tested systems that reliably reduce sound between floors while ensuring that occupants are protected by fire-rated assemblies.**

- Low-profile leveling gypsum concrete system featuring an unmatched range of compressive strengths from 2,500 to 8,000 psi
- Improves sound control in nominal wood-joist, engineered I-joist, open-web truss, steel joist and concrete floor systems
- Provides 1- and 2-hour fire-resistance ratings for wood-framed floor/ceiling assemblies, and a 4-hour rating for precast concrete assemblies
- Systems are tested by industry standards for durability

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### **LEVELROCK™ SRM-25™ Sound Reduction Mat**

- Low-profile 1/4" sound reduction mat covered by 1" LEVELROCK underlayment allows use of a full range of flooring finish materials including hardwood, engineered laminate, ceramic tile and marble with smooth transitions between surfaces
- Elevated on small nodes so less than 5% of surface area makes direct contact with the subfloor
- Refer to submittal sheet IG1619 for more information

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### LEVELROCK™ SRB™ Sound Reduction Board

- Economical sound reduction board used under LEVELROCK underlayment to meet or exceed new minimum IBC code criteria of 50 IIC and 50 STC
- Smooth, coated finish resists abrasion and maintains tight tolerance
- Low-profile 3/8" thickness (1-1/8" when covered by 3/4" LEVELROCK underlayment) allows flexibility in choosing flooring materials
- Refer to submittal sheet IG1523 for more information

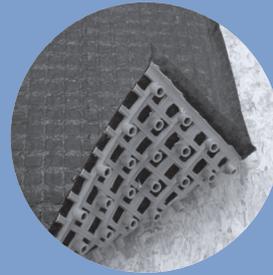
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### LEVELROCK™ Perimeter Isolation Strip

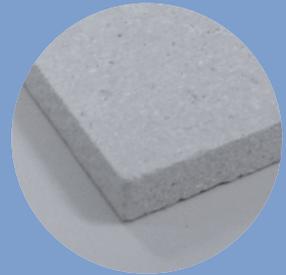
- Isolates floor from walls to create an acoustical break that minimizes flanking paths of sound
- Light, flexible isolation material

#### Using the Best Components

#### SRM-25 Sound Reduction Mat



#### SRB Sound Reduction Board



<b>Material composition</b>	Polyethylene core and polypropylene mat	Mineral fiber board
<b>Thickness, nominal</b>	1/4"	3/8"
<b>Size</b>	3' x 110' roll	4' x 4' sheet
<b>Weight</b>	75 lbs./roll, <0.25 lbs./sq. ft.	8 lbs./sheet
<b>Roll diameter</b>	21"	N/A
<b>Density</b>	2.4 cu. ft.	24 ± 2 lbs./cu.ft.
<b>Color</b>	Black core and black fabric	Tannish brown
<b>UL Classified</b>	Yes <sup>a</sup>	Yes <sup>a</sup>

(a) Refer to [www.ul.com](http://www.ul.com) for the most current list of fire-rated designs available.

# Test

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## Reliability

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Many floor underlayment manufacturers rely on field tests to promote products. However, since all buildings are constructed differently, consistent test methods and conditions are essential to ensure that products meet the requirements of the 2003 International Building Code (IBC).

### What's Important

All LEVELROCK floor underlayments are tested under laboratory conditions at NVLAP-accredited facilities in accordance with ASTM E492 and Section 1207 of the 2003 IBC. It may be more expensive to test in a laboratory, but the reliability of the results is more important than the cost.

Section 1207 of the 2003 IBC mandates a minimum STC of 50 (45 if field-tested) for airborne sound and a minimum IIC of 50 (45 if field-tested) for structure-borne sound.

Unlike field tests, laboratory sound tests can be used from one project to the next because they are designed to test assemblies with calibrated equipment at laboratories accredited by NVLAP (National Voluntary Laboratory Accreditation Program). The test chambers are designed to ensure that only the assembly itself influences the result, so that a valid comparison can be made between different assemblies and between tests of the same assemblies in different labs.

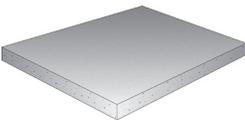
Look for the labels IIC and STC instead of FIIC and FSTC, which indicate field tests.

Because field tests accept all the limitations present under field conditions, they provide a measure of the acoustical environment only for the specific space tested, instead of a laboratory-controlled, standard environment. It is difficult to predict from a field test the acoustical performance in a room with a different layout or different construction than the one tested. Field tests, which are much cheaper, use a less restrictive test environment and a wider variety of measurement techniques than laboratory tests.

# Design

## for Fire and Sound

### 1 Hour rated

Floor System	UL Number	Sound Mat	LEVELROCK Floor Underlayment <sup>a</sup>	Insulation	Truss Depth	RC-1 Channel	SHEETROCK FIRECODE C CORE Ceiling Assembly	Floor Covering	Sound Rating		Test Number	
									STC	IIC	STC	IIC
<b>Open Web Wood Joist</b> 	L521	none	3/4"	3 1/2" batt	18"	16" o.c.	1 layer 5/8"	vinyl	58	48	RAL-TL-97-340	RAL-IN-97-47
								carpet & pad		76		
	L528	none	3/4"	none	12"	16" o.c.	1 layer 5/8"	carpet & pad	53	60	RAL-TL-04-321	RAL-IN-04-019
	L521	SRM-25	1"	3 1/2" batt	12"	16" o.c.	1 layer 5/8"	vinyl	62	53	RAL-OT-04-01	RAL-OT-04-02
								cushioned vinyl	62	55	RAL-OT-04-03	RAL-OT-04-04
								carpet & pad	62	81	RAL-OT-04-05	RAL-OT-04-06
								wood laminate	61	55	RAL-OT-04-07	RAL-OT-04-08
							ceramic tile <sup>e</sup>	62	54	RAL-OT-04-11	RAL-OT-04-12	
<b>Engineered Wood I-Joist</b> 	L570	SRB	3/4"	3 1/2" batt	9 1/2"	16" o.c.	2 layer 1/2"	wood laminate	65	61	RAL-OT-02-03	RAL-OT-02-04
								vinyl	65	54	RAL-OT-03-01	RAL-OT-03-02
								ceramic tile <sup>e</sup>	66	51	RAL-OT-03-03	RAL-OT-03-04
	L570	SRM-25	1"	3 1/2" batt	9 1/2"	16" o.c.	2 layer 1/2"	none	65	52	USG-00302 <sup>c</sup>	USG-00302 <sup>c</sup>
								vinyl	64	58	RAL-OT-03-05	RAL-OT-03-06
								wood laminate	64	62	RAL-OT-03-07	RAL-OT-03-08
							ceramic tile	66	54	RAL-OT-03-09	RAL-OT-03-10	
<b>2" x 10" Wood Joist</b> 	L569	none	none	3 1/2" batt	10"	16" o.c.	1 layer 5/8"	none	51	41	RAL-TL-99-047	RAL-IN-99-005
	L569	SRM-25	1"	3 1/2" batt	10"	16" o.c.	1 layer 5/8"	vinyl	58	51	RAL-TL-04-031	RAL-IN-04-004
								cushioned vinyl	59	54	RAL-TL-04-033	RAL-IN-04-006
								carpet & pad	59	77	RAL-TL-04-032	RAL-IN-04-005
								wood laminate	58	55	RAL-TL-04-034	RAL-IN-04-007
								ceramic tile <sup>e</sup>	59	52	RAL-TL-04-067	RAL-IN-04-009
	L569	SRB	3/4"	3 1/2" batt	10"	16" o.c.	1 layer 5/8"	cushioned vinyl	58	50	RAL-TL-04-100	RAL-IN-04-013
							carpet & pad	58	73	RAL-TL-04-097	RAL-IN-04-010	
							wood laminate	58	51	RAL-TL-04-099	RAL-IN-04-012	
<b>Steel Joist<sup>d</sup></b> 	G551	SRM-25	1"	3 1/2" batt	9 1/4"	none	1 layer 5/8"	vinyl	64	55	RAL-OT-05-007	RAL-OT-05-008
								carpet & pad	63	81	RAL-OT-05-009	RAL-OT-05-010
								wood laminate	63	58	RAL-OT-05-011	RAL-OT-05-012
								ceramic tile	65	51	RAL-OT-05-015	RAL-OT-05-016
<b>6" Concrete</b> 	D900 <sup>b</sup>	SRM-25	1"	none	6"	none	none	vinyl	56	49	RAL-TL-03-176	RAL-IN-03-006
								wood laminate	54	50	RAL-TL-03-177	RAL-IN-03-007
								ceramic tile <sup>e</sup>	56	51	RAL-TL-03-210	RAL-IN-03-010
	D900 <sup>b</sup>	SRM-25	1"	none	6"	none	none	carpet & pad		77		RAL-IN-03-009
								none		50		RAL-IN-03-008
	D900 <sup>b</sup>	none	none	none	6"	none	none	none		26		RAL-IN-00-RD22

#### Note

- LEVELROCK floor underlayment has been tested with other sound mats. Contact USG for details.
- D900 refers to a series of concrete fire-rated systems. 6" concrete at 135 lbs./cu. ft. can provide a 2-hour rating. Please refer to the UL Directory for additional information.
- Test completed for baseline reference only.
- Tested with TRADEREADY steel joist.
- Requires crack isolation membrane.

# Resources

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## USG Literature

**Poured Cementitious Floor Systems** (SA305)  
**LEVELROCK Floor Underlayment Product Selector** (IG1503)

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## Technical Assistance

**800 USG.4YOU**  
Expert advice for any project-related inquiries.

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**USG Gypsum Construction Handbook**  
The industry's best resource for good construction practices.

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## Government Web Sites

**National Voluntary Laboratory Accreditation Program (NVLAP)**  
<http://ts.nist.gov/ts/htdocs/210/214/214.htm>

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## Industry Web Sites

**International Building Code (IBC)**  
[www.iccsafe.org](http://www.iccsafe.org)

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**National Association of Home Builders**  
<http://www.nahb.org/>

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**American National Standards Institute (ANSI)**  
<http://www.ansi.org/>

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**Radiant Panel Association**  
<http://www.radiantpanelassociation.org>

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**American Institute of Architects**  
<http://www.aia.org>





**Technical Service**

800 USG.4YOU

**Web Site**

levelrock.com

**Literature**

888 874.2450

**Samples**

817 329.1808

**Customer Service**

800 950.3839

**Product Information**

See levelrock.com for the most up-to-date product information.

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We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss cause by application of these

goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

**Safety First!**

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.

