

# Hardirock®

# FIRE X®



When exposed to fire, all gypsum board products release chemically combined water in the form of steam. This natural reaction retards the transfer of heat by creating a thermal barrier.

Hardirock 5/8" Fire X is manufactured to provide a greater degree of this fire resistant quality than regular gypsum boards. It has a Type X core that is reinforced with noncombustible fibers. This formulation allows the sheets to remain intact longer under high heat conditions. When 5/8" Fire X is used in specific construction assemblies, fire ratings of up to 4 hours can be achieved. These systems are also able to reduce the transmission of sound from one interior area to another.

Hardirock 5/8" Fire X is designed for commercial projects where building codes require a structure to possess fire resistance and sound reduction capabilities. Included are applications such as shaftwalls, stairwells, corridors, floors/ceilings and columns. 5/8" Fire X can also be used for area separation walls in multi-family construction and for added sag resistance in residential ceilings.

Hardirock 5/8" Fire X is manufactured with the long edges tapered to facilitate the application of joint compound. High quality manila face paper provides a smooth surface that can be decorated with paint, texture or wallpaper.



**Hardirock® 5/8" Fire X®  
Gypsum Board For  
Fire Rated Construction**

### PHYSICAL PROPERTIES

Hardirock® 5/8" Fire X gypsum board meets or exceeds the physical property requirements specified in American Society for Testing and Materials (ASTM) C 36.

Fire X Board	
Thickness	5/8" (15.9 mm)
Width	4', 54" (1219 mm, 1371mm)
Standard Lengths	8', 9', 10', 12' (2438, 2743, 3048, 3658 mm)
Edges	Tapered
Approx. Weight	2.1 psf (10.3 kg/m <sup>2</sup> )

For further information consult a James Hardie Gypsum sales representative. All products are not available in all geographic areas. Consult local building codes for regulations in your area.

### SURFACE BURNING CHARACTERISTICS

When tested in accordance with ASTM E 84:

Flame Spread (Class I, Class A) 0 - 25  
Smoke Developed 0

### HANDLING AND STORAGE

Hardirock gypsum boards should be stacked flat on a smooth, level surface, but not stored directly on concrete floors. When spacers are used, position them closely enough together to minimize warpage. Care should be taken to prevent damage to edges and corners. Always keep Hardirock gypsum board dry prior to installation.

### TECHNICAL REFERENCES

For additional information on application and finishing consult:

- BOCA® National Building Code
- Standard Building Code
- Uniform Building Code
- CABO One- and Two-Family Dwelling Code
- Gypsum Association Brochures GA-214, GA-216 and GA-600
- ASTM C 475, C 514, C 645, C 754, C 840, C 1002, C 1047, E 119
- As a member of the Gypsum Association, James Hardie's Fire X Gypsum Board is recognized for use in ICBO Evaluation Service Report #1632

For Additional Product Information  
Contact James Hardie Gypsum  
Technical Services Department  
Phone: 1-800-346-3537  
Web Site: [www.hardirock.com](http://www.hardirock.com)



**James Hardie  
Gypsum**

## FIRE RATED SYSTEM DESIGNS

FIRE	SOUND	SYSTEM DESCRIPTION
<b>INTERIOR WALLS - WOOD FRAMING</b>		
1 Hour	35 to 39 STC	One layer Hardirock 5/8" Fire X gypsum board applied parallel to or at right angles to each side of 2" x 4" wood studs spaced 24" o.c. with 6d coated nails 1-7/8" long, 0.0915" shank, 1/4" heads, 7" o.c. Wallboard nailed to top and bottom plates at 7" o.c. Stagger joints 24" o.c. each side. (LOAD BEARING)
<b>INTERIOR WALLS - WOOD FRAMING</b>		
2 Hour	40 to 44 STC	Base layer Hardirock 5/8" Fire X gypsum board applied at right angles to each side of 2" x 4" wood studs 24" o.c. with 6d coated nails, 1-7/8" long, 0.085" shank, 1/4" heads, 24" o.c. Face layer Hardirock 5/8" Fire X gypsum board applied at right angles to studs over base layer with 8d coated nails, 2-3/8" long, 0.100" shank, 1/4" heads, 8" o.c. Stagger joints 24" o.c. each layer and side. Sound tested with studs 16" o.c. and with nails for base layer spaced 6" o.c. (LOAD BEARING)
<b>INTERIOR WALLS - STEEL FRAMING</b>		
1 Hour	40 to 44 STC	One layer Hardirock 5/8" Fire X gypsum board applied at right angles or parallel to each side of 3-5/8" metal studs 24" o.c. with 1" Type S drywall screws 8" o.c. to vertical edges and 12" o.c. to top and bottom runners and intermediate studs. Stagger all vertical and horizontal joints 24" o.c. each side and opposite sides. (NON-LOAD BEARING)
<b>INTERIOR WALLS - STEEL FRAMING</b>		
2 Hour	40 to 44 STC	Base layer Hardirock 5/8" Fire X gypsum board applied parallel to each side of 3-5/8" metal studs spaced 24" o.c. with 1" Type S drywall screws 8" o.c. to edges and 12" o.c. to intermediate studs. Face layer Hardirock 5/8" Fire X gypsum board applied parallel to studs over base layers with laminating compound combed over entire surface. Metal base and top retainer channels. Stagger joints 24" o.c. each layer and side. (NON LOAD BEARING)
<b>INTERIOR WALLS - STEEL FRAMING</b>		
2 Hour	50 to 54 STC	Base layer Hardirock 5/8" Fire X gypsum board applied parallel or at right angles to each side of 2-1/2" metal studs 24" o.c. with 1" Type S drywall screws 24" o.c. Screws spaced 1/2" from vertical end joints and 3/4" from horizontal edge joints. Face layer Hardirock 5/8" Fire X gypsum board applied parallel or at right angles to each side with 1-5/8" Type S drywall screws 12" o.c. Screws spaced 1/2" from vertical end joints and 1" from horizontal edge joints. Stagger joints 24" o.c. each layer and side. Sound tested with 2-1/2" glass fiber in stud space. (NON LOAD BEARING)
<b>FLOOR/CEILING - WOOD FRAMING</b>		
1 Hour	35 to 39 STC	Base layer Hardirock 5/8" Fire X gypsum board applied at right angles to 2" x 10" wood joists 24" o.c. with 1-1/4" Type S drywall screws 24" o.c. Face layer Hardirock 5/8" Fire X gypsum board applied at right angles to joists through base layer with 1-7/8" Type S drywall screws 12" o.c. at joints and intermediate joists. Face layer joints offset 24" from base layer joints, 1-1/2" Type G drywall screws placed 2" back on either side of face layer end joints, 12" o.c. 1/2" plywood with exterior glue applied at right angles to top of joists with 8d nails. Ceiling provides one hour fire resistance protection for wood framing, including trusses.



THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
4-7/8" (124.8 mm)	7 psf (34.3 kg/m <sup>2</sup> )	UL R3501-47,-48, 9-17-65 Design U309 UL R1319-129 7-22-70 Design U314	NGC 2404 10-14-70	WP 3520
THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
6-1/8" (155.6 mm)	12 psf (58.5 kg/m <sup>2</sup> )	FM WP 360 9-27-74	NGC 2363 4-1-70	WP 4136
THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
4-7/8" (124.8 mm)	6 psf (29.4 kg/m <sup>2</sup> )	FM WP-45, 6-19-68 OSU T-17-70, 8-61 ULC 79T484, 79T500, 79T497, 8-12-81 ULC Design W415	NGC 2385 7-28-70	WP 1200
THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
6-1/8" (155.6 mm)	10 psf (49 kg/m <sup>2</sup> )	UL R1319-31 6-2-60 Design U411	RAL TL 61-213 7-6-61	WP 1711
THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
5" (127 mm)	12 psf (58.5 kg/m <sup>2</sup> )	WHI-495-0236 1-30-80	WHI-218-1 6-11-80	WP 1548
THICKNESS	APPROX. WT.	FIRE TEST	SOUND TEST	GA FILE #
N/A	5 psf (24.5 kg/m <sup>2</sup> )	FM FC 172 2-25-72	Estimated	FC 5406

1. All construction shall comply with local building codes.  
 2. Only those components specified shall be used when constructing any fire or sound rated system. Substitutions may adversely affect performance capabilities.  
 3. In addition to numerous assemblies listed in the GA-600, James Hardie Gypsum 5/8" Fire X is classified in Underwriters Laboratories File R8701 for Design Numbers: G520, L501, N502, N505, L505, L508, U338, U425 and X528.

## CUTTING

The score and snap method is a fast and efficient way to cut Hardirock gypsum boards.

Steps:

1. On the face side, position a straight edge along the line of cut.
2. Score with a knife or other suitable tool.
3. With a quick, firm motion, snap back away from the face.
4. The back paper can either be cut with a knife or separated by snapping the piece in the opposite direction.
5. Smooth all cut ends and edges to ensure tight joints.

Hardirock gypsum board can also be cut with a saw. For information on avoiding dust inhalation, refer to the Material Safety Data Sheet available where James Hardie Gypsum products are sold. Wear safety glasses and hearing protection when using power tools.

To make cut outs, score around the perimeter on the face and break and tap out waste piece from the face side. For rectangular openings, it may be helpful to score diagonally from corner to corner. Cut outs can also be made with a drywall saw.

## INSTALLATION

A fire resistance rating expresses the amount of time that a given assembly will provide fire protection when tested in accordance with ASTM E 119. Illustrated (pages 2&3) are system designs that can achieve 1 and 2 hour ratings using 5/8" Fire X gypsum board. For performance and installation information on other tested systems including those for beams, girders, trusses, columns and exterior walls, consult the Gypsum Association Fire Resistance Design Manual GA-600.

### Attachment

1. Hardirock Fire X gypsum board shall be installed on the ceilings first. Apply at right angles to framing.
2. Unless specified in fire or sound rated assemblies, horizontal wall application is recommended to give added strength and reduce the number of joints.
3. Starting in the upper corner of the wall, work across and down. Ends and edges of sheets shall be in moderate contact.
4. Holding Hardirock 5/8" Fire X gypsum board firmly against the framing, begin fastening in the center of the sheet and move outward toward ends and edges. Use the fastener types and spacing specified in the system design. Nails or screws must not be less than

3/8" or further than 1/2" from the ends and edges of the sheets (except where floating angles are used).

5. Set fastener heads slightly indented from the surface without breaking the face paper or damaging gypsum core.
6. Install sheets in a brick pattern with the ends staggered and supported by the framing members. Joints shall not fall on the same studs as those directly on the opposite side of the wall.
7. Cut openings out of full sheets or lay out joints to fall on the studs nearest the center of doors and windows. Where possible, position full sheets to extend completely above and below openings and avoid piecing.

### Expansion Joints

Expansion joints, as specified and detailed by the architect, shall be installed in the following situations:

- In ceilings exceeding 2500 sq. ft. in area and where the framing or furring changes direction. The distance between expansion joints shall not be greater than 50' in either direction.
- In partition, wall and wall furring runs exceeding 30' in length. Distances between expansion joints shall not be greater than 30'. Wall or partition height door frames may be utilized as expansion joints.
- Opposite of where an expansion joint occurs in the exterior base wall construction.
- To coincide whenever possible with control joints of the building.

When partitions are erected to span the full height of slabs between floors as required for fire or STC rated assemblies, a relief joint shall be used at the top to accommodate normal structural slab or beam movement without loading the partition.

### Joint, Corner and Surface Preparation

These areas must be finished in accordance with ASTM C 840, the GA-216, the Fire Resistance Design Manual GA-600 and the joint compound manufacturer's instructions. Materials shall comply with ASTM C 475 and ASTM C 1047.

1. No treatment of joints shall be done until the interior temperature has been maintained at a minimum of 50° F for at least 48 hours prior to application of compounds and until all materials have completely dried. Adequate continuous ventilation must also be provided.

2. Fill and level joints with joint compound.
3. Embed tape into the wet compound and allow to dry. For inside corners, crease the tape and work it into joint.
4. Apply a second coat of compound across the joint and feather to approximately 4" on each side.
5. Apply a third coat and feather to approximately 6" on each side.
6. Allow each coat to dry before proceeding.
7. Attach corner bead to outside corners and apply three coats of joint compound. Feather out each coat as described in steps 4-6.
8. Spot cover all fastener heads with three coats of joint compound applied in different directions.
9. Lightly sand the last coat of all treated areas, taking care not to rough the surrounding gypsum board paper. Smoothing can also be accomplished with a damp sponge.

### Finishing

Hardirock 5/8" Fire X gypsum board can be finished with paint, texture or wallpaper. A high quality primer/sealer must be used prior to any type of final decoration. For high gloss paint and severe lighting conditions, a thin skim coat of joint compound should be applied across the entire surface. This will help minimize the irregularities and porosity differences between materials. Refer to GA-214 for additional finishing instructions.

## LIMITATIONS

- Gypsum board shall not be used in areas that are continuously or repeatedly exposed to excessive moisture or steam such as saunas, gang shower rooms or swimming pool enclosures.
- Gypsum board shall not be exposed to sustained temperatures exceeding 125° F.
- The weight of ceiling insulation shall not exceed 2 pounds per square foot.
- Sheets should not come in direct contact with concrete, masonry or other surfaces that have a high moisture content.
- Not recommended for use with radiant heat ceilings. For specific systems contact the James Hardie Gypsum Technical Services Department.

**Consider local climatic conditions and consult local building codes.**

## WARRANTY

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