

Hardirock®

Max "C"™



Hardirock Max "C" gypsum wallboard has a specially formulated core that meets all the requirements of ASTM C 36 for Type X gypsum wallboard. Hardirock Max "C" has additional properties that further enhance the fire resistive characteristics of the product for use in numerous fire rated residential, multifamily, and commercial applications. Common applications may include areas such as elevator shafts, stairwells, partitions, columns, and floor/ceiling assemblies. Max "C" wallboard comes in both 1/2" and 5/8" thicknesses and a variety of lengths.

Hardirock Max "C" wallboard 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 texture, paint, or wallpaper.



Hardirock® 1/2" and 5/8" Max "C"™ Improved Type X Gypsum Wallboard

PHYSICAL PROPERTIES

Both Hardirock® 1/2" and 5/8" Max "C" gypsum wallboard meet or exceed all requirements specified in American Society for Testing and Materials (ASTM) C 36.

	1/2" Max "C"	5/8" Max "C"
Thickness	1/2" (12.7 mm)	5/8" (15.9 mm)
Width	4' (1219 mm)	4' (1219 mm)
Standard Lengths	8', 9', 10', 12' (2438, 2743, 3048, 3658 mm)	8', 12' (2438, 3658 mm)
Edges	Tapered	Tapered
Approx. Weight	1.8 psf (8.8 kg/m ²)	2.3 psf (11.2 kg/m ²)

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
- UL Fire Resistance Design Directory
- Gypsum Association Brochures GA-214, GA-216 and GA-600
- ASTM C 754 and C 840
- As a member of the Gypsum Association, James Hardie's Max "C" Gypsum Board is recognized for use in ICBO Evaluation Service Reports #1632 and 1874

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



**James Hardie
Gypsum**



FIRE RATED SYSTEM DESIGNS

FIRE	SOUND	SYSTEM DESCRIPTION
INTERIOR WALLS - METAL FRAMING		
2 Hour	U454 55-59 STC	
		<p>Resilient channels 24" o.c. attached at right angles to ONE SIDE of 3-1/2", 20 gauge steel studs 24" o.c. with one 1/2" Type S-12 drywall screw at each stud. Base layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied at right angles to channels with 1" Type S drywall screws 24" o.c. Face layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied at right angles to channels with 1-5/8" Type S drywall screws 12" o.c. 3" mineral fiber insulation, 2 pcf, friction fit in stud space. OPPOSITE SIDE: Base layer 1/2" Max "C" gypsum wallboard applied parallel to studs with 1" Type S-12 drywall screws 24" o.c. Face layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied parallel to studs with 1-5/8" Type S-12 drywall screws 12" o.c.</p>
INTERIOR WALLS - METAL FRAMING		
3 Hour	U435 50-54 FSTC	
		<p>Base layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied parallel to each side of 1-5/8", 25 gauge steel studs 24" o.c. with 1" Type S drywall screws 48" o.c. Second layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied parallel to each side with 1-5/8" Type S drywall screws 48" o.c. Face layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied parallel or at right angles to each side with 2-1/4" Type S drywall screws 12" o.c. and 1-1/2" Type G drywall screws midway between studs 1" above and below horizontal joints for right angle application. Sound tested with 1-1/2" glass fiber insulation, friction fit.</p>
FLOOR/CEILING - METAL FRAMING		
1 Hour	L524	
		<p>Base layer 1/2" Max "C" gypsum wallboard applied at right angles to channel shaped, minimum 7" deep, 18 gauge galvanized steel joists 24" o.c. with 1" Type S-12 drywall screws 8" o.c. at butt joints and 12" o.c. at intermediate joists. Face layer 1/2" Max "C" gypsum wallboard applied at right angles to joists with 1-1/2" Type G drywall screws at butt joints between joists and 1-5/8" Type S-12 drywall screws 12" o.c. at intermediate joists. Joints offset from base layer joints. Steel joists supporting 5/8" T&G edge plywood floor applied at right angles to joists with 1-15/16" No. 6-20 S-12 point screws 6" o.c. at floor perimeter and end joints and 10" o.c. at intermediate joists. For alternate floor systems, consult manufacturer.</p>
FLOOR/CEILING - METAL FRAMING		
3 Hour	G512 50-54 STC	
		<p>One layer 5/8" Max "C" gypsum wallboard or gypsum veneer base applied at right angles to furring channels 24" o.c. (double channels at end joints) with 1" Type S drywall screws 12" o.c. 5/8" x 2-3/4" Max "C" gypsum wallboard strips over butt joints. Furring channels wire tied to open web steel joist 24" o.c. supporting 3/8" rib metal lath and 2-1/2" concrete slab. (Three hour restrained and unrestrained.)</p>
FLOOR/CEILING - WOOD FRAMING		
1 Hour	L528	
		<p>One layer 5/8" Max "C" gypsum wallboard or gypsum veneer base applied at right angles to rigid furring or resilient channels 24" o.c. with 1" Type S drywall screws 12" o.c. and located a minimum of 1-1/2" from joints. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channel 60" long with screws 12" o.c. Rigid furring channels applied at right angles to 12" deep parallel chord wood trusses 24" o.c. with double strand, 18 gauge galvanized steel wire ties 48" o.c. Wood trusses supporting 3/4" nominal interior plywood with exterior glue, T & G edges, applied at right angles to trusses with construction adhesive and 6d ring shank nails 12" o.c. Adhesive applied to each top chord and grooved edges of plywood. End joints staggered 48".</p>
COLUMN - METAL FRAMING		
4 Hour	X507	
		<p>Base layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied to 1-5/8", 25 gauge steel studs located at each corner of heavy steel W14x228 column with 1" Type S drywall screws 12" o.c. Face layer 1/2" Max "C" gypsum wallboard or gypsum veneer base applied to studs with 1-5/8" Type S drywall screws 12" o.c. 1-1/4" corner bead applied with 4d coated nails, 1-3/8" long, 0.067" shank, 13/64" heads, 12" o.c.</p>



THICKNESS	LIMITING HEIGHT	APPROX. WT.	FIRE TEST	GA FILE #	Max "C" is included in but not limited to the following UL Designs:																																																																																																																																
6-1/2" (165.1 mm)	Refer to GA-600 97 Refer to manufacturer	12 psf (58.8 kg/m ²)	UL Design U454	WP 1470		<table border="0"> <tr> <td>1/2"</td> <td>5/8"</td> </tr> <tr><td>G502</td><td>D301</td></tr> <tr><td>G526</td><td>D501</td></tr> <tr><td>G528</td><td>G512</td></tr> <tr><td>G531</td><td>G515</td></tr> <tr><td>L512</td><td>G521</td></tr> <tr><td>L514</td><td>G523</td></tr> <tr><td>L524</td><td>G525</td></tr> <tr><td>L525</td><td>G526</td></tr> <tr><td>L542</td><td>G528</td></tr> <tr><td>P237</td><td>G531</td></tr> <tr><td>P510</td><td>J501</td></tr> <tr><td>U307</td><td>J502</td></tr> <tr><td>U317</td><td>J503</td></tr> <tr><td>U406</td><td>J504</td></tr> <tr><td>U412</td><td>L501</td></tr> <tr><td>U423</td><td>L508</td></tr> <tr><td>U425</td><td>L511</td></tr> <tr><td>U426</td><td>L512</td></tr> <tr><td>U435</td><td>L513</td></tr> <tr><td>U436</td><td>L514</td></tr> <tr><td>U438</td><td>L516</td></tr> <tr><td>U440</td><td>L525</td></tr> <tr><td>U441</td><td>L527</td></tr> <tr><td>U443</td><td>L528</td></tr> <tr><td>U444</td><td>L529</td></tr> <tr><td>U448</td><td>L538</td></tr> <tr><td>U451</td><td>L545</td></tr> <tr><td>U452</td><td>N501</td></tr> <tr><td>U453</td><td>N502</td></tr> <tr><td>U454</td><td>N505</td></tr> <tr><td>U455</td><td>P509</td></tr> <tr><td>U467</td><td>P510</td></tr> <tr><td>U474</td><td>P513</td></tr> <tr><td>U478</td><td>P514</td></tr> <tr><td>U497</td><td>P519</td></tr> <tr><td>U529</td><td>U023</td></tr> <tr><td>U601</td><td>U301</td></tr> <tr><td>U603</td><td>U302</td></tr> <tr><td>U608</td><td>U305</td></tr> <tr><td>U611</td><td>U333</td></tr> <tr><td>U612</td><td>U334</td></tr> <tr><td>U613</td><td>U342</td></tr> <tr><td>U619</td><td>U355</td></tr> <tr><td>U620</td><td>U411</td></tr> <tr><td>U910</td><td>U423</td></tr> <tr><td>U912</td><td>U424</td></tr> <tr><td>U914</td><td>U467</td></tr> <tr><td>X507</td><td>U469</td></tr> <tr><td>X514</td><td>U602</td></tr> <tr><td>X515</td><td>U603</td></tr> <tr><td>X518</td><td>U605</td></tr> <tr><td>X522</td><td>U618</td></tr> <tr><td>X524</td><td>U623</td></tr> <tr><td>X530</td><td>U626</td></tr> <tr><td>X531</td><td>U627</td></tr> <tr><td></td><td>U634</td></tr> <tr><td></td><td>U635</td></tr> <tr><td></td><td>U639</td></tr> <tr><td></td><td>U640</td></tr> <tr><td></td><td>U642</td></tr> <tr><td></td><td>U643</td></tr> <tr><td></td><td>U645</td></tr> <tr><td></td><td>U805</td></tr> </table>	1/2"	5/8"	G502	D301	G526	D501	G528	G512	G531	G515	L512	G521	L514	G523	L524	G525	L525	G526	L542	G528	P237	G531	P510	J501	U307	J502	U317	J503	U406	J504	U412	L501	U423	L508	U425	L511	U426	L512	U435	L513	U436	L514	U438	L516	U440	L525	U441	L527	U443	L528	U444	L529	U448	L538	U451	L545	U452	N501	U453	N502	U454	N505	U455	P509	U467	P510	U474	P513	U478	P514	U497	P519	U529	U023	U601	U301	U603	U302	U608	U305	U611	U333	U612	U334	U613	U342	U619	U355	U620	U411	U910	U423	U912	U424	U914	U467	X507	U469	X514	U602	X515	U603	X518	U605	X522	U618	X524	U623	X530	U626	X531	U627		U634		U635		U639		U640		U642		U643		U645	
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4-5/8" (117.5 mm)	Refer to GA-600 97 Refer to manufacturer	13 psf (63.7 kg/m ²)	WHI-495-0804 11-19-86 UL Design U435	WP 2922																																																																																																																																	
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N/A	N/A	4 psf (19.6 kg/m ²)	UL Design L524	FC 4502																																																																																																																																	
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N/A	N/A	3 psf (14.7 kg/m ²)	UL R-1319-79, 4-4-77 UL R3501, 88NK21023, 11-27-89 UL R3660-7, -8, 11-12-87 UL R2717-61, 8-18-87 Design G512	FC 3012																																																																																																																																	
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N/A	N/A	3 psf (14.7 kg/m ²)	UL R9500-1, 80NK15492 2-2-81 UL R2717-61 8-18-87 Design L528	FC 5515																																																																																																																																	
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N/A	N/A	N/A	UL R1319-127, 8-20-69 UL R3660-7, -8, 11-12-87 UL R7094, 90NK10635, 12-4-90 Design X507	CM 4322																																																																																																																																	

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. James Hardie Gypsum Max "C" is classified in Underwriters Laboratories File R8701.

CUTTING

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

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 1/2" and 5/8" Max "C" gypsum board. For performance and installation information on other tested systems consult the Gypsum Association Fire Resistance Design Manual GA-600.

Attachment

1. Hardirock Max "C" 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 1/2" or 5/8" Max "C" gypsum board firmly against 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 should be finished in accordance with ASTM C 840, the GA-216 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 1/2" or 5/8" Max "C" 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

Hardie expressly warrants title and that the products sold by it hereunder are free from defects in materials at the time of shipment. THIS WARRANTY IS LIMITED TO THE ORIGINAL OWNER, and may not be enlarged by any sales representative, written sales information or drawings. EXCEPT FOR SUCH EXPRESS WARRANTIES, HARDIE MAKES NO WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED AND ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND OTHER WARRANTIES OF ANY KIND ARE HEREBY DISCLAIMED BY HARDIE AND EXCLUDED. PURCHASER AGREES THIS HAS BEEN NEGOTIATED AND CONSENTS HERETO. Hardie shall have the right, at its sole option, to replace or repair any defective products, to refund the purchase price, or grant a reasonable allowance on account of such defects. Any claims or exceptions by Purchaser for defective products must be made in writing within 30 days after Purchaser's receipt of shipment and in all events before installation is commenced, and Purchaser shall give Hardie an opportunity to investigate. HARDIE IS FURNISHING BASIC PRODUCTS AT STANDARD PRICES AND IS NOT INSURING PURCHASER AGAINST POSSIBLE CONSEQUENCES OF ERROR, OMISSION OR NEGLIGENCE IN PRODUCTION OR DELIVERY, EXCEPT FOR BREACH OF THE EXPRESS WARRANTIES SPECIFIED IN THIS SECTION. HARDIE SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE ON ACCOUNT OF ANY IMPERFECTION, DEVIATION FROM SPECIFICATIONS OR OTHER DEFECT IMPAIRING THE QUALITY, VALUE OR SUITABILITY FOR ANY PURPOSE OF ANY PRODUCT SOLD HEREUNDER, WHETHER CAUSED BY HARDIE'S NEGLIGENCE OR OTHERWISE, IN NO EVENT SHALL HARDIE BE LIABLE FOR CONSEQUENTIAL, SPECIAL OR CONTINGENT DAMAGES, OR ANY OTHER CLAIM OR DEMAND WHATSOEVER, EXCEPT TO THE EXTENT OF THE PURCHASE PRICE OF THE PRODUCT, THE REFUND OF WHICH SHALL BE PURCHASER'S SOLE AND EXCLUSIVE REMEDY HEREUNDER. PURCHASER ASSUMES ALL RISK OF LOSS, DAMAGE OR DELAY INCIDENT TO THE FURNISHING OF ANY PRODUCT BY HARDIE HEREUNDER, OR THE UTILIZATION THEREOF, EXCEPT TO THE EXTENT EXPRESSLY ABOVE PROVIDED. PURCHASER AGREES THIS HAS BEEN NEGOTIATED AND CONSENTS HERETO. 9/99