



Product Selection Guide and Architectural Assemblies



The Georgia-Pacific Gypsum Product Line

Georgia-Pacific Gypsum constantly monitors and controls the manufacturing process to ensure gypsum product reliability and consistency. To support this commitment to customer satisfaction, Georgia-Pacific Gypsum offers limited warranties for its gypsum products. See www.gpgypsum.com for warranty details. Products are certified through testing procedures with established designations for:

ASTM Product Standards
ASTM Application Standards
CSA Standards

Additional testing has been performed on certain products indicated as:

UL Classified **CTC Tested**
ULC Classified **TPI Tested**
WHI Classified **FM Tested and Approved**

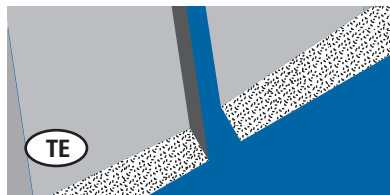
Other classifications, designations and testing, which may have been performed on particular products, have been indicated where applicable in this directory.

The information contained in this directory is intended to be informative and accurate. However, it is to be used as a technical guideline and does not replace the judgments and designs of a qualified architect and/or engineer. Georgia-Pacific Gypsum is not responsible for product damage or defects resulting from incorrect application, storage, handling or abuse.

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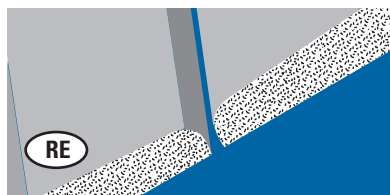
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Gypsum Board Edge Details



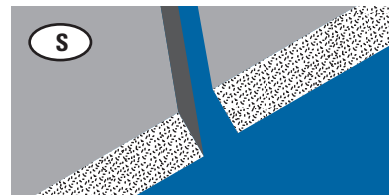
Tapered

The tapered edge was originally called the "recessed edge." This taper allows space for tape and joint treatment to be applied, so the completed job will be flat, smooth and monolithic. Width of taper is about 2" (51mm).



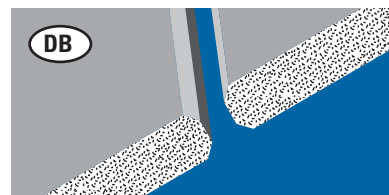
Tapered with Round Edge

Round edge is designed to reduce the beading and ridging problems commonly associated with standard-type gypsum board. This edge formation provides a stronger joint when ToughRock® Setting Compound is used for all joint finishing steps.



Square

Square edge was the original wallboard edge. Initially designed to be a base with a final covering such as wallpaper, paneling or tile. Now used primarily as sheathing and backer board.



Double Beveled

DensGlass® Shaftliner panels are produced with double beveled edges to allow a quick, easy fit into the supporting grooves of metal shaftwall, stairwell and area separation walls.

CAUTION: For important fire, safety and use information, go to page 7.

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ToughRock® Gypsum Board

Product	Dimensions			Edge					Standard*		
	TH	W	L	TE	S	RE	B	DB	ASTM	FEDERAL	CSA
ToughRock® Gypsum Wallboard – For interior walls and ceilings. Accommodates wide range of decorative treatments.	1/4" (6.4 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•	•				C 1396 C 36	SS-L-30d Type III	A82.27 M
		4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•						Grade R	
		4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•	•	•					
ToughRock® Fireguard® Gypsum Board – Noncombustible gypsum core. Interior wall, floor and ceiling applications. Can be used in select fire-rated assemblies. Meets basic Type X requirements.	5/8" (15.9 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)	•	•	•	•		C 1396 C 36	SS-L-30d Type III Grade X	A82.27 M
ToughRock® Fireguard C™ Gypsum Board – Use as described above. Appropriate for select commercial applications requiring extended fire resistance. Exceeds basic Type X requirements.	1/2" (12.7 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)	•	•	•	•		C 1396 C 36	SS-L-30d Type III Grade R	A82.27 M
	5/8" (15.9 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)	•		•	•				
ToughRock® Moisture-Guard® (Greenboard) – Water-resistant gypsum core and paper surfacing.	1/2" (12.7 mm)	4' (1219 mm)	8', 10', 12' (2438, 3048, 3658 mm)	•					C 1396 C 630	SS-L-30d Type VII Grade W	A82.27 M
ToughRock® Fireguard® Moisture-Guard® – Use as described above. Available in 1/2" (12.7 mm) and 5/8" (15.9 mm) with fire-resistant Type X core.	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1396 C 630	SS-L-30d Type VII Grade W, X	A82.27 M
	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•							
ToughRock® Mold-Guard™ (Mold Resistant) – For interior walls and ceiling, enhanced mold and moisture protection for high humidity areas, treated paper and moisture-treated core.	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1396 C 630	SS-L-30d Type VII Grade W	A82.27 M
ToughRock Mold-Guard Gypsum Board – Use as described above. Can be used in select fire-rated assemblies. Meets basic Type X requirements.	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1396 C 630	SS-L-30d Type VII Grade W, X	A82.27 M

ToughRock® Specialty Products

Product	Dimensions			Edge					Standard*		
	TH	W	L	TE	S	RE	B	DB	ASTM	FEDERAL	CSA
ToughRock® 54" Wide Gypsum Board – For interior walls and ceilings. Accommodates wide range of decorative treatments. Eliminates filler strip.	1/2" (12.7 mm)	54" (1371 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1396 C 36	SS-L-30d Type III Grade R	A82.27 M
	5/8" (15.9 mm)	54" (1371 mm)									
ToughRock® CD® Ceiling Board – Specially formulated core and paper ceiling board designed for water-based, textured ceiling applications. Sag resistant.	1/2" (12.7 mm)	4' (1219 mm)	12' (3658 mm)	•					C 1396 C 1395	SS-L-30d Type III Grade R	
ToughRock® Fireguard® Soffit Board – Soffit board with treated paper face bonded to specially formulated core designed to resist sag and moisture. For exterior use such as outdoor building soffits, carports and outdoor applications where there is no direct exposure to weather.	1/2" (12.7 mm)	4' (1219 mm)	8', 9', 10' (2438 mm to 3048 mm)	•					C 1396 C 931		A82.27 M
	5/8" (15.9 mm)	4' (1219 mm)		•							
ToughRock® Sound Deadening Board – Use with 1/2" (12.7 mm) ToughRock Fireguard C or 5/8" (15.9 mm) ToughRock Fireguard to meet requirements for sound and fire resistance.	1/4" (6.4 mm)	4' (1219 mm)	8' (2438 mm)	•					C 1396 C 442	SS-L-30d Type IV Grade R	A82.27 M
ToughRock® FlexRoc® Gypsum Board – High flex gypsum board designed for inside and outside radius curve installations including archways, columns, curved columns, curved partition walls and curved stairways.	1/4" (6.4 mm)	4' (1219 mm)	8' (2438 mm)	•					C 1396 C 36	SS-L-30d Type III Grade R	A82.27 M
ToughRock® Fireguard® Abuse-Guard® Gypsum Board – Abuse-resistant gypsum board for high traffic areas where surface durability and surface indentation are important. Specifically formulated to offer greater abrasion, rubbing, scraping and gouging resistance than regular paper-faced drywall.	5/8" (15.9 mm)	4' (1219 mm)	12' (3658 mm)	•					C 1396 C 36	SS-L-30d Type III Grade X	A82.27 M

*The federal and CSA standards, as well as certain ASTM standards, listed have been withdrawn or replaced and are provided for information only.

Note: Some products are not available at all plants or locations. Call sales office listed on back cover for specific product availability.

CAUTION: For important fire, safety and use information, go to page 7.

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Dens™ Brand Fiberglass Mat Gypsum Panels

Product	Dimensions			Edge					Standard*
	TH	W	L	TE	S	RE	B	DB	ASTM
<p>The DensArmor Plus® family of gypsum panels are GREENGUARD Indoor Air Quality Certified® and GREENGUARD Children & Schools™ certified for low VOCs.</p> <p>DensArmor Plus® High-Performance Interior Panel – Fiberglass mat gypsum interior panel consisting of moisture-resistant noncombustible gypsum core with coated fiberglass mat facings front and back. Offers superior resistance to moisture and mold.</p>	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, Applicable Sections of C 1177, C 1396 and C 630
<p>DensArmor Plus® Fireguard® High-Performance Interior Panel – Type X gypsum panel is UL and ULC classified, has fiberglass mat facings on front and back for superior resistance to moisture and mold.</p>	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, Applicable Sections of C 1177, C 1396 and C 630
<p>DensArmor Plus® Fireguard C™ Interior Panel – Noncombustible gypsum core with fiberglass mat facings on front and back. Use as described above. Appropriate for select applications requiring extended fire resistance ratings and for added protection against mold growth in the wall cavity. UL and ULC Classified. Exceeds basic Type X requirements.</p>	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, Applicable Sections of C 1177, C 1396 and C 630
	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					
<p>DensArmor Plus® Fireguard® Abuse-Resistant Interior Panel – Abuse-resistant fiberglass mat panel for high traffic areas. Fiberglass mat and treated core offer superior resistance to moisture and mold. UL Classified.</p>	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, Applicable Sections of C 1177, C 1396, C 630 Test Standard C 1629
<p>DensArmor Plus® Fireguard® Impact-Resistant Interior Panel – Fiberglass mat interior gypsum panel specifically designed to resist high or continual impact and protect the stud cavity. Specially formulated core provides greater resistance to surface indentation and abuse. UL Classified.</p>	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, Applicable Sections of C 1177, C 1396, C 630 Test Standard C 1629
<p>DensShield® Tile Backer – Tile backer board for installing tile on interior walls, ceilings, floors and countertops. Superior moisture protection for permanent tile installations. Easily installed, light-weight and outperforms cement board.</p>	1/4" (6.4 mm)	4' (1219 mm)	4' (1219 mm)	•					C 1178
	1/2" (12.7 mm)	32" (813 mm)	5' (1524 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	5' (1524 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	8' (2438 mm)	•					
<p>DensShield® Fireguard® Tile Backer – Use as described above. Patented tile backer with noncombustible core. Can be used in select fire-rated assemblies. UL and ULC Classified.</p>	5/8" (15.9 mm)	4' (1219 mm)	8' (2438 mm)	•					C 1178
<p>DensDeck® Roof Board – Superior, nonstructural thermal barrier roof board for commercial roof and re-roof applications. Fiberglass mat facings with water-resistant treated core.</p>	1/4" (6.4 mm)	4' (1219 mm)	8' (2438 mm)	•					C 1177
	1/2" (12.7 mm)	4' (1219 mm)	4' (1219 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	8' (2438 mm)	•					
<p>DensDeck® Prime Roof Board – Premium, non-structural roof board engineered with a proprietary, non asphaltic coating to enhance bonding in commercial roofing systems. Fiberglass mat facings with water-resistant, treated core.</p>	1/4" (6.4 mm)	4' (1219 mm)	4' (1219 mm)	•					C 1177
	1/4" (6.4 mm)	4' (1219 mm)	8' (2438 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	4' (1219 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	8' (2438 mm)	•					
<p>DensDeck® DuraGuard Roof Board – An enhanced roof board incorporating a low perm, integrated coating for self-adhesive and built up roofing systems with all the features of DensDeck roof board.</p>	1/4" (6.4 mm)	4' (1219 mm)	4' (1219 mm)	•					C 1177
	1/4" (6.4 mm)	4' (1219 mm)	8' (2438 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	4' (1219 mm)	•					
	1/2" (12.7 mm)	4' (1219 mm)	8' (2438 mm)	•					

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Dens Brand Fiberglass Mat Gypsum Boards
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Dens™ Brand Fiberglass Mat Gypsum Panels continued from previous page

Product	Dimensions			Edge					Standard*			
	TH	W	L	TE	S	RE	B	DB	ASTM			
DensDeck®, DensDeck® Prime and DensDeck® DuraGuard Fireguard® Roof Board – Use as described above. Can replace 5/8" (15.9 mm) Type X gypsum board under prefix "P" in UL Fire Resistance Directory. Qualifies for numerous 1- and 2-hour fire-rated assemblies.	5/8" (15.9 mm) 5/8" (15.9 mm)	4' (1219 mm) 4' (1219 mm)	4' (1219 mm) 8' (2438 mm)		•					C 1177		
DensGlass® Sheathing – Fiberglass mat exterior substrate panel for walls, ceilings and soffits. Ideal for EIFS, brick and other exterior cladding applications.	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)		•					C 1177		
DensGlass® Fireguard® Sheathing – Use as described above. Can replace 5/8" (15.9 mm) Type X sheathing in fire-rated wall assemblies. Qualifies for numerous 1- and 2-hour fire-rated assemblies. UL/ULC Classified.	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm) 8' to 16' (2438 mm to 4876 mm)		•					C 1177		
DensGlass® Shaftliner Panels – For use with metal stud shaftwall, stairwell or area separation wall systems. Fiberglass mats increase weather resistance and resist the growth of mold. Patented product with moisture-resistant, treated, Type X core. Beveled edges facilitate fit into metal components. UL/ULC Classified.	1" (25.4 mm)	23-7/8" (606 mm)	8' to 12' (2438 mm to 3658 mm)						•	C 1658 Applicable Sections of C 1396 and C 442		

Veneer Board

Product	Dimensions			Edge					Standard*		
	TH	W	L	TE	S	RE	B	DB	ASTM	FEDERAL	CSA
ToughRock® Veneer Plaster Base (Blue Board) – Gypsum wallboard with high-suction face paper. Use in conjunction with PearlCote™ Interior Veneer Plaster.	1/2" (12.7 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)		•				C 1396 C 588	SS-L-30d Type VI Grade R	A82.27 M
ToughRock® Fireguard® Veneer Plaster Base – Use as described above. Same fire rating as ToughRock Fireguard gypsum board. UL/ULC Classified. Type X core.	5/8" (15.9 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)		•				C 1396 C 588	SS-L-30d Type VI Grade X	A82.27 M
ToughRock® Fireguard C™ Veneer Plaster Base – Use as described above. Noncombustible core. Same fire rating as ToughRock Fireguard C gypsum wallboard. UL and ULC Classified. Exceeds basic Type X requirements.	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)		•				C 1396 C 588	SL-L-30d Type III Grade R	A82.27 M

Textures and Plaster

Product	Package Size	Coverage	Standards*
			ASTM
PearlCote™ Interior Veneer Plaster – A one-coat plaster application designed for commercial or residential use on walls or ceilings to resist abrasion or damage while maintaining moisture and mold resistance.	50-lb. bags (22 kg)	150 sq. ft. per bag (14 m ²)	C 587
ToughRock™ Regency Ceiling Textures/Polystyrene – For spray application only. A high-quality aggregate finish with superior ceiling coverage. For use with gypsum board or concrete ceilings. Not recommended for high-moisture areas such as bathrooms.	35-lb. bags (16 kg) 40-lb. bags (18 kg) 50-lb. bags (22 kg)	250 sq. ft. per bag (23 m ²) 285 sq. ft. per bag (26 m ²) 350 sq. ft. per bag (33 m ²)	
ToughRock™ Wall and Ceiling Texture – A decorative spray application for both walls and ceilings. Commonly used for splatter application, knock-down and orange peel type textures.	50-lb. bags (22 kg)	Up to 2,000 sq. ft. per bag (186 m ²) depending on finish	

Note: Some products are not available at all plants or locations. Call sales office listed on back cover for specific product availability.

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Joint Treatment Systems

Product	Package Size	Coverage	Standards*
			ASTM
ToughRock® All-Purpose Dry Compound – Use for bedding tape, finishing joints, filling corner bead, spotting, skim coating and texturing.	25 lb. (11 kg) bags	25 lbs. (11 kg) per 400 sq. ft. (37 m ²) for joints; 15–50 lbs. (7–23 kg) per 1,000 sq. ft. (93 m ²) for texturing	C 475
ToughRock® Setting Compounds – Allows complete taping and finishing in one day. Recommended for cold weather and slow drying conditions. Hardens by setting, not drying. Available 45- and 90-minute. Ideal products for patch and repair jobs.	33 lb. (15 kg) bags	1,800 sq. ft. (167 m ²) per 33 lb. (15 kg) bag	C 475
ToughRock® Sandable Setting Compounds – Same use as ToughRock Setting Compounds. Applies and sands easier than ToughRock Setting Compounds. Available in 20-, 45- and 90-minute.	18 lb. (11 kg) bags 24 lb. bags	1,000 sq. ft. (93 m ²) per 18 lb. (8 kg) bag 1,300 sq. ft. (121 m ²) per 24 lb. (11 kg) bag	C 475
ToughRock® Ready-Mix All-Purpose Joint Compound – Pre-mixed, ready to use for bedding tape, finishing joints, skim coating and texturing.	12 lb. (20 kg) pails 61.7 lb. (28 kg) pails 48 lb. (27 kg) ctn.	61.7 lbs. (28 kg) per 500 sq. ft. (46 m ²)	C 475
ToughRock® Lightweight Joint Compound – Pre-mixed, ready to use for finishing joints and cornerbead. Shrinks less and is easier to sand than All Purpose.	4.5-gallon cartons & pails 1 gal pail 17-liter ctns.	4.5 gallons (17 L) per 500 sq. ft. (46 m ²)	C 475
ToughRock® Semi-Light Joint Compound – Pre-mixed, ready to use for bedding tape, finishing joints, cornerbead and skim coating.	3.5 and 4.5-gallon cartons & pails (23 kg) ctns.	4.5 gallons (17 L) per 500 sq. ft. (46 m ²)	C 475
ToughRock® Ready-Mix Topping Compound – Pre-mixed and ready to use. Finish applications only. Very white in color, easy to sand.	61.7 lb. pail 48 lb. carton	40 lbs. (18 kg) per 500 sq. ft. (46 m ²)	C 475
ToughRock® Fire-Halt® Sealant – A noncombustible fast-setting compound for use as a firestop sealant for penetrations such as pipes, conduit and telephone cables in fire-resistive assemblies; and as filler for the flutes in steel decks. Listed with Warnock Hersey International/Intertek Testing Services.	15 lb. (1.7 kg) pails 33 lb. (15 kg) bags	1 lb. (.119 L) powder mixed will fill 30 cubic inches (.049 m ³)	C 475
ToughRock™ Tape – Special 2-1/16" (52.4 mm) wide paper tape. Reinforces gypsum joints. Pre-creased for ease of application.	75 ft (22.86 m) rolls 250 ft (76.2 m) rolls 500 ft (152.4 m) rolls	400' (122 m) per 1,000 sq. ft. (93 m ²) of gypsum board	C 475

*The federal and CSA standards, as well as certain ASTM standards, listed have been withdrawn or replaced and are provided for information only.

Important Safety and Use Information

The following contains important safety and use information concerning Georgia-Pacific Gypsum products, including information regarding fire, moisture and mold resistance. However, please note that the information contained in this directory may change without notice. **For current product fire, safety and use information, go to www.gp.com/safetyinfo or call 1-800-225-6119.**

Fire and Sound Resistance

Information presented in this directory concerning fire resistance ratings (such as 1-hour or 2-hour ratings) is presented for illustration purposes only and reflects the results of tests conducted on systems composed of specific materials assembled in a specific manner or independent approvals based on further evaluations or inferences from such tests. The use of other materials or construction methods may adversely affect performance. In addition, independent organizations such as Underwriters Laboratories, Inc. may authorize specific products to be labeled as acceptable for use in certain fire rated systems, based on criteria deemed appropriate by such organizations, without a full-scale fire test of the systems including that product. Please consult the appropriate fire resistance directory, such as Underwriters Laboratories, Inc.'s Fire Resistance Directory, for information concerning each fire resistance rating and assembly.

Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.

"Type X" as used in this directory designates gypsum board manufactured and tested in accordance with specific ASTM standards for increased fire resistance beyond regular gypsum board. Please consult the ASTM standard for the specific product (for example, ASTM C 1396 for standard gypsum panels and ASTM C 1658 for glass mat gypsum panels) for further information and significance of use.

"Noncombustible" as used in this directory is based on testing of identified products, as manufactured, in accordance with ASTM E 136. This ASTM standard is used to measure the response of products to heat and flame under controlled laboratory conditions and does not purport to address all of the fire safety concerns, if any, associated with the product. Please consult ASTM E 136 for further information and significance of use.

Information in this directory relating to sound resistance is based on the characteristics, properties and performance of materials and systems obtained under controlled test conditions as set forth in applicable ASTM standards, such as ASTM E 90. Conditions caused by design, installation or other factors may adversely impact sound resistance in any structure, and therefore the sound resistance of any building product when used in actual job site conditions may not produce the same results as were achieved in the controlled, laboratory setting.

Moisture and Mold Resistance

Moisture resistance and mold resistance, as used in this directory, are determined on the basis of applicable ASTM standards. For example, moisture resistance of gypsum panels is generally determined in accordance with Section 7 of ASTM C 1396. While some products are subject to limited warranties for normal weather exposure, products are not intended for immersion in water and should be handled and stored in accordance with Georgia-Pacific Gypsum guidelines and good industry practice.

Unless otherwise specifically indicated, mold resistance is based on testing of products, as manufactured, in accordance with ASTM D 3273. A score of 10, the highest level of performance for mold resistance under the ASTM D 3273 test method, indicates no mold growth in a 4-week controlled laboratory test.

The mold resistance of any building product when used in actual job site conditions may not produce the same results as were achieved in the controlled, laboratory setting. No material can be considered mold proof, as mold can grow on virtually any surface when exposed to the right elements. When properly used with good design, handling and construction practices, Georgia-Pacific Gypsum's Dens™ Brand gypsum products and ToughRock® Mold-Guard™ gypsum products provide increased mold resistance compared to standard paper-faced wallboard.

Handling and Use

Georgia-Pacific Gypsum products should be stored, handled and installed in accordance with Georgia-Pacific Gypsum's storage and installation instructions, standard building practices, and all applicable building codes. Georgia-Pacific Gypsum's storage and installation instructions are available from the selling dealer and at www.gpgypsum.com. **For Material Safety Data Sheets or additional product fire, safety and use information go to www.gp.com/safetyinfo or call 1-800-225-6119.** Please specifically note the following important guidelines:

Gypsum Boards and Panels

CAUTION: This product contains fiberglass and/or fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

Joint Treatment

WARNING! Sanding or abrading this product after drying may generate dust which can irritate eyes, nose, throat, skin and upper respiratory tract. Use wet sanding to minimize dust generation and always maintain proper ventilation in the work area. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Use a dust mask or NIOSH/MSHA approved respiratory protection during mixing dry materials, while sanding and during clean-up as appropriate.

Setting Compounds and Plaster


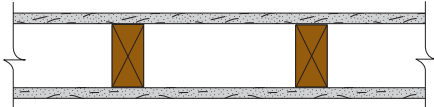


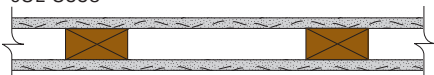
WARNING! Heat develops as the product hardens (rehydrates) and may cause serious burns resulting in possible permanent injury. After mixing with water, do not allow prolonged contact with skin until the product has completely hardened and cooled.

Mixing or sanding this product after drying may generate dust which can irritate eyes, nose, throat, skin and upper respiratory tract. Use wet sanding to minimize dust generation and always maintain proper ventilation in the work area. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Use a dust mask or NIOSH/MSHA approved respiratory protection during mixing dry materials, while sanding and during clean-up as appropriate.

The following information in this catalog for wall partitions/wood studs, wall partitions/metal studs, and floor/ceiling assemblies has been organized for ease of reference and is presented for illustration only. Installation details and technical data are located adjacent to each other. For more detailed information please reference the individual testing agencies' listings. For important fire, safety and use information, go to page 7 and www.gp.com/safetyinfo.

"Est." in the following information means estimated results. Check with local code jurisdictions or design authority before using or including in plans.

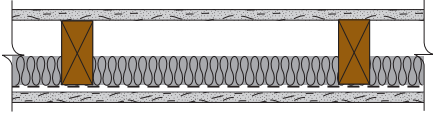
Wood-Framed Wall Assemblies

<p>45-Min. Fire Rating Test Reference: UL U317, cUL U317</p> 	<p>Partition Thickness: 4-5/8" (118 mm), Weight per Sq. Ft.: 6.0 (29 kg/m²) 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied parallel or at right angles to each side of 2 x 4 wood studs 16" (406 mm) o.c. with 1-5/8" (41 mm) cement coated nails spaced 7" (178 mm) o.c. Joints staggered.</p>
<p>1-Hour Fire Rating Test Reference: UL U305, ULC W301, GA WP 3605, cUL U305</p> 	<p>30-34 STC Sound Trans. Test Reference: OR 64-8 Partition Thickness: 4-7/8" (124 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²) 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied parallel or at right angles to each side of 2 x 4 wood studs 16" (406 mm) o.c. with 1-7/8" (48 mm) 6d coated nails spaced 7" (178 mm) o.c. Joints staggered.</p>
<p>1-Hour Fire Rating Test Reference: FM WP 90, GA WP 3520</p> 	<p>35-39 STC Sound Trans. Test Reference: G&H NG-246FT Partition Thickness: 4-7/8" (124 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²) 5/8" (15.9 mm) ToughRock Fireguard gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side of 2 x 4 wood studs 24" (610 mm) o.c. with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. at joints and top and bottom plates and 3/8" (10 mm) beads of adhesive at intermediate studs. Joints staggered.</p>
<p>1-Hour Fire Rating Test Reference: UC, 1-12-66, GA WP 3620, cUL U338</p> 	<p>30-34 STC Sound Trans. Test Reference: G&H IBI-35FT Partition Thickness: 4-7/8" (124 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²) Sound Tested without gypsum veneer plaster 1/2" (12.7 mm) ToughRock veneer base Type X applied at right angles to each side of 2 x 4 wood studs 16" (406 mm) o.c. with 1-3/4" (45 mm) 5d etched nails 8" (203 mm) o.c. 1/16" (1.6 mm) Pearl Cote™ Interior Veneer Plaster applied over each face. Vertical joints staggered 16" (406 mm) and horizontal joints 12" (305 mm) on opposite sides.</p>
<p>1-Hour Fire Rating Test Reference: UL U338, GA WP 3640, cUL U338</p> 	<p>Partition Thickness: 2-7/8" (73 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²) 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to each side of 2 x 3 or 2 x 4 wood studs, turned flatwise 24" (610 mm) o.c. with 1-7/8" (48 mm) 6d cement coated nails 7" (178 mm) o.c. (non load-bearing).</p>

Wood-Framed Wall Assemblies *continued*

1-Hour Fire Rating

Test Reference: OSU T-3127



50-54 STC Sound Trans.

Test Reference: RAL TL77-138

Partition Thickness: 5-1/4" (133 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation

5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied parallel to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws at edges 6" (152 mm) o.c. and center row 12" (305 mm) o.c. at intermediate studs. End joints back-blocked with resilient channels. Resilient channels attached at right angles to 2 x 4 wood studs 16" (406 mm) o.c. with 1-7/8" (48 mm) 6d coated nails. 1/2" x 3" (12.7 mm x 76 mm) gypsum board filler strip attached to plate at floor line with 6d coated nails 16" (406 mm) o.c. 1-1/2" (38 mm) fiberglass 0.8 pcf (12.8 kg/m³) attached to studs in stud space with 1/2" (12.7 mm) long staples. On opposite side, one layer 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to studs with 6d coated nails, 8" (203 mm) o.c. Stagger end joints 48" (1219 mm) o.c. each side.

1-Hour Fire Rating

Test Reference: UL U305, ULC W301, GA WP 5515



40-44 STC Sound Trans.

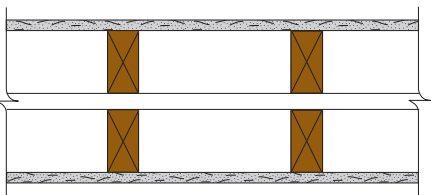
Test Reference: NRCC TL-93-254, IRC-IR-761

Partition Thickness: 7-3/4" (197 mm), Weight per Sq. Ft.: 8.0 (39 kg/m²)

5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to each side of 2 x 4 wood studs 16" (406 mm) o.c. staggered 8" (203 mm) o.c. on 2 x 6 wood plates with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. Wallboard nailed to top and bottom plates 7" (178 mm) o.c. Stagger joints each side. Horizontal bracing required at mid height.

1-Hour Fire Rating

Test Reference: UL U305, ULC W301, GA WP 5512



45-49 STC Sound Trans.

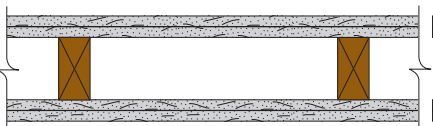
Test Reference: NRCC TL-93-261, IRC-IR-761

Partition Thickness: 9-1/4" (235 mm), Weight per Sq. Ft.: 8.0 (39 kg/m²)

5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to each side of double row of 2 x 4 wood studs 16" (406 mm) o.c. on separate plates 1" (25 mm) apart with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. Wallboard nailed to top and bottom plates 7" (178 mm) o.c. Stagger joints each side. Horizontal bracing required at mid height.

2-Hour Fire Rating

Test Reference: UL U301, cUL U301



40-44 STC Sound Trans.

Test Reference: NGC-2363

Partition Thickness: 6-1/8" (156 mm), Weight per Sq. Ft.: 12.0 (59 kg/m²)

Sound Tested with studs 16" (406 mm) o.c. and with nails for base layer spaced 6" (152 mm) o.c.

Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or at right angles using 1-7/8" (48 mm) 6d coated nails 6" (152 mm) o.c. to each side of 2 x 4 wood studs 16" (406 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or at right angles to studs over base layer with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c. Stagger joints 16" (406 mm) o.c. each layer and side.

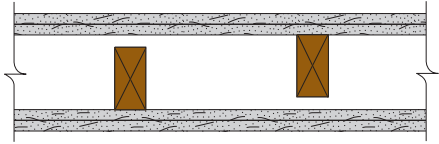
CAUTION: For important fire, safety and use information, go to page 7.

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Wood-Framed Wall Assemblies continued

2-Hour Fire Rating

Test Reference: FM WP 360, GA WP 3910



50-54 STC Sound Trans.

Test Reference: NGC-2377

Partition Thickness: 8" (203 mm), Weight per Sq. Ft.: 13.0 (64 kg/m²)

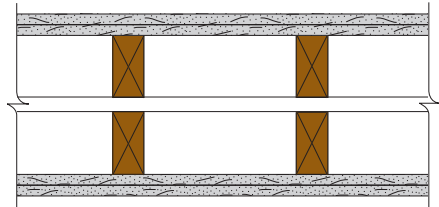
Sound Tested with nails for base layer spaced 6" (152 mm) o.c.

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied at right angles to each side of 2 x 4 wood studs 16" (406 mm) o.c. staggered 8" (203 mm) o.c. on 2 x 6 wood plates with 1-7/8" (48 mm) 6d coated nails 24" (610 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to studs with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c. Stagger vertical joints 16" (406 mm) o.c. each layer and side. Horizontal bracing required at mid height.

2-Hour Fire Rating

Test Reference: FM WP 360, GA WP 3820



55-59 STC Sound Trans.

Test Reference: NGC-3056

Partition Thickness: 10-3/4" (273 mm), Weight per Sq. Ft.: 13.0 (64 kg/m²)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation stapled to studs in stud spaces on one side.

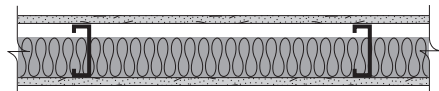
Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to each side of double row of 2 x 4 wood studs 16" (406 mm) o.c. on separate plates 1" (25 mm) apart with 1-7/8" (48 mm) 6d coated nails 24" (610 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board or 5/8" (15.9 mm) DensShield® Fireguard® Tile Backer applied at right angles to each side with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c. Stagger vertical joints 16" (406 mm) o.c. each layer and side. Horizontal bracing required at mid height.

Steel-Framed Wall Assemblies

1-Hour Fire Rating

Test Reference: ULC W412, GA WP 1070



45-49 STC Sound Trans.

Test Reference: RAL TL69-42

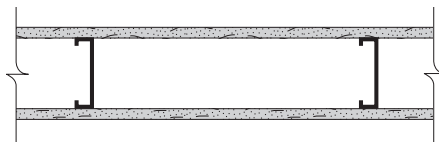
Partition Thickness: 3-1/2" (89 mm), Weight per Sq. Ft.: 5.0 (24 kg/m²)

Sound Tested with 2" (51 mm) mineral fiberglass insulation

1/2" (12.7 mm) ToughRock® Fireguard C™ gypsum board applied parallel to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at vertical joints and 12" (305 mm) o.c. at intermediate studs. 1-1/2" (38 mm) mineral fiber insulation, stapled to board in stud space. Joints staggered.

1-Hour Fire Rating

Test Reference: UL U465, ULC W415, GA WP 1081



48 STC Sound Trans.

Test Reference: RAL TL99-103

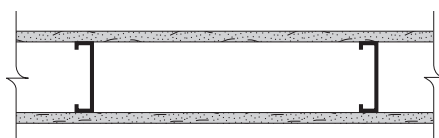
Partition Thickness: 4-7/8" (124 mm), Weight per Sq. Ft.: 5.0 (24 kg/m²)

Sound Tested with 3" (76 mm) mineral fiber, 2.5 pcf (40.1 kg/m³), in stud space.

5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically to each side of 3-5/8" (92 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at edges and 12" (305 mm) o.c. at intermediate studs.

1-Hour Fire Rating

Test Reference: UL V 450, GA WP 1411, cUL V450



Partition Thickness: 4-7/8" (124 mm), Weight per Sq. Ft.: 5.0 (24 kg/m²)

5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically to each side of 3-5/8" (92 mm) UltraSTEEL® studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at edges and 12" (305 mm) o.c. at intermediate studs. Joints staggered.

CAUTION: For important fire, safety and use information, go to page 7.

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Steel-Framed Wall Assemblies continued

1-Hour Fire Rating

Test Reference: UC 12-28-65, GA WP 1090



45-49 STC Sound Trans.

Test Reference: ACI 7-115 2019c

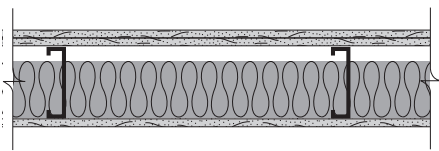
Partition Thickness: 3-1/8" (79 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²)

Base Layer: 1/4" (6.4 mm) ToughRock® gypsum board applied parallel to each side of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c. at vertical joints and 36" (914 mm) o.c. at intermediate studs.

Face Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Stagger joints.

1-Hour Fire Rating

Test Reference: WHI 495-0614, GA WP 1023



50-54 STC Sound Trans.

Test Reference: RAL TL88-54

Partition Thickness: 5-5/8" (143 mm), Weight per Sq. Ft.: 7.0 (34 kg/m²)

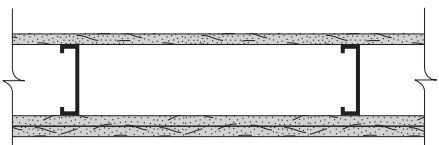
1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to one side of 3-5/8" (92 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. to vertical joints and 12" (305 mm) o.c. to intermediate studs. Studs attached to top and bottom runner with Type S pan head screws.

Opposite Side Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to studs with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to framing with 1-5/8" (41 mm) Type S drywall screws 8" (203 mm) o.c. at end joints and 12" (305 mm) o.c. at perimeter and intermediate studs. Stagger vertical joints 24" (610 mm) o.c. Stagger horizontal joints 24" (610 mm) o.c. each layer and side. Fiberglass insulation, 2-3/4" (70 mm) thick, 0.30 pcf (4.8 kg/m³), friction fit in stud space.

1-Hour Fire Rating

Test Reference: OSU T-1770, GA WP 1052



50-54 STC Sound Trans.

Test Reference: NRCC 817-NV

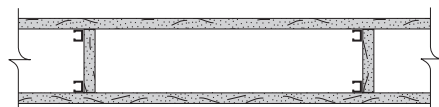
Partition Thickness: 5-1/2" (140 mm), Weight per Sq. Ft.: 8.0 (39 kg/m²)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation friction fit in stud space 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied parallel or at right angles to each side of 3-5/8" (92 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at vertical joints and 12" (305 mm) o.c. at wall perimeter and intermediate studs. Studs attached to top and bottom runner with Type S pan head screws.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to one side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c.

1-Hour Fire Rating

Test Reference: UL U420, GA WP 5015, cUL U420



50-54 STC Sound Trans.

Test Reference: RAL TL76-155

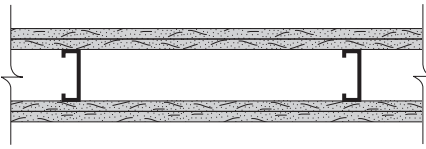
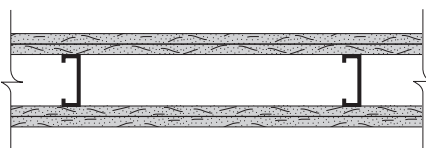
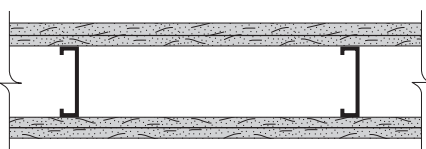
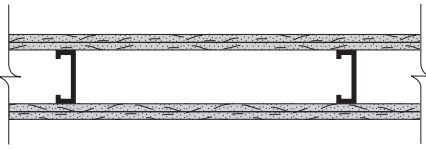
Partition Thickness: 10-3/4" (273 mm), Weight per Sq. Ft.: 5.5 (27 kg/m²)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation, stapled to one side in cavity 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to a double row of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. and not less than 1" (25 mm) apart with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at edges and top and bottom runners, 12" (305 mm) o.c. in field. Stagger joints 24" (610 mm) each side. 5/8" (15.9 mm) gypsum board pieces 12" (305 mm) long x 4-1/2" (114 mm) wide located at 1/3 points used as cross braces fastened to stud pairs with three 1" (25 mm) Type S drywall screws at each end of brace. Optional 25-gauge (18 mils), stud or runner pieces not less than 4-1/2" (114 mm) long may be used as cross braces and attached with two No. 8, 1/2" (13 mm) self-drilling steel screws at each end.

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Steel-Framed Wall Assemblies *continued*

<p>2-Hour Fire Rating Test Reference: UL V487, cUL V487</p> 	<p>Partition Thickness: 4-1/8" (105 mm), Weight per Sq. Ft: 10 (49 kg/m²) Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied horizontally or vertically to each side of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S screws 12" (305 mm) o.c. Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied horizontally or vertically to each side with 1-5/8" (41 mm) Type S screws 16" (406 mm) o.c. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers staggered a min of 12 in. (305 mm)</p>
<p>2-Hour Fire Rating Test Reference: UL U411, cUL U411</p> 	<p>50-54 STC Sound Trans. Test Reference: WHI 218-1 Partition Thickness: 5-1/8" (130 mm), Weight per Sq. Ft.: 10.0 (49 kg/m²) Sound Tested with 2-1/2" (64 mm) fiberglass insulation Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S screws 16" (406 mm) o.c. Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side with drywall adhesive or secured with 1-5/8" (41 mm) Type S screws 12" (305 mm) o.c. at top and bottom track, 16" (406 mm) o.c. at edge joints and intermediate framing. Stagger joints 24" (610 mm) each layer and side.</p>
<p>2-Hour Fire Rating Test Reference: UL U411, cUL U411, GA WP 1522</p> 	<p>55-59 STC Sound Trans. Test Reference: NRCC 818-NV Partition Thickness: 6-1/8" (156 mm), Weight per Sq. Ft.: 10.0 (49 kg/m²) Sound Tested with 3-1/2" (89 mm) fiberglass insulation, friction fit in 3-5/8" (92 mm) stud space Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S screws 16" (406 mm) o.c. Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side with drywall adhesive or secured with 1-5/8" (41 mm) Type S screws 12" (305 mm) o.c. at top and bottom track, 16" (406 mm) o.c. at edge joints and intermediate framing. Stagger joints 24" (610 mm) each layer and side.</p>
<p>2-Hour Fire Rating Test Reference: UL V450, GA WP 1944</p> 	<p>Partition Thickness: 4-1/8" (105 mm), Weight per Sq. Ft.: 10.0 (49 kg/m²) Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to each side of 1-5/8" (41 mm) UltraSTEEL® studs 24" (610 mm) o.c. with 1-1/4" (32 mm) Type S screws 24" (610 mm) o.c. Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to each side with 1-5/8" (41 mm) Type S screws 8" (203 mm) o.c. at end joints and 12" (305 mm) o.c. at perimeter. Stagger joints 12" (305 mm) each layer.</p>

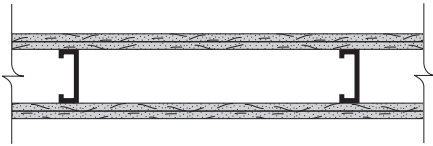
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Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

Test Reference: UL U412, cUL U412



45-49 STC Sound Trans.

Test Reference: NGC 2250

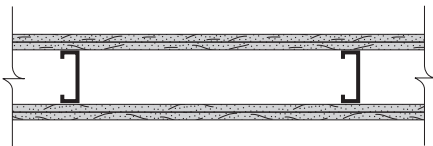
Partition Thickness: 4-1/2" (114 mm), Weight per Sq. Ft.: 9.0 (44 kg/m²)

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied parallel to each side of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Joints staggered 24" (610 mm) each layer and side.

2-Hour Fire Rating

Test Reference: ULC W414, GA WP 1546



50-54 STC Sound Trans.

Test Reference: NRCC 798-NV

Partition Thickness: 4-1/2" (114 mm), Weight per Sq. Ft.: 9.0 (44 kg/m²)

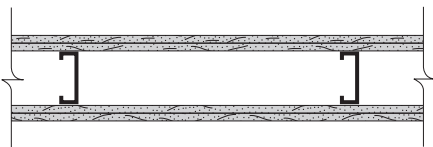
Sound Tested with 2-1/2" (64 mm) fiberglass insulation stapled in stud space

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Joints staggered 24" (610 mm) each layer and side.

2-Hour Fire Rating

Test Reference: ULC W414, GA WP 1546



55-59 STC Sound Trans.

Test Reference: NRCC 815-NV

Partition Thickness: 4-1/2" (114 mm), Weight per Sq. Ft.: 9.0 (44 kg/m²)

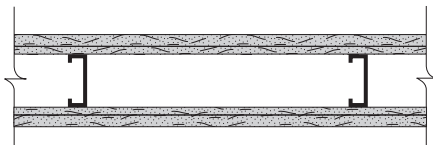
Sound Tested with 3-1/2" (89 mm) fiberglass insulation, friction fit in 3-5/8" (92 mm) stud cavity

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Joints staggered 24" (610 mm) each layer and side.

2-Hour Fire Rating

Test Reference: ULC W404, GA WP 1505



55-59 STC Sound Trans.

Test Reference: DRC 70-18-2

Partition Thickness: 4-3/4" (121 mm), Weight per Sq. Ft.: 10.0 (49 kg/m²)

Sound Tested with adhesive attachment and 2-1/2" (64 mm) fiberglass insulation, friction fit in stud space

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied at right angles to each side of 2-1/2" (64 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c.

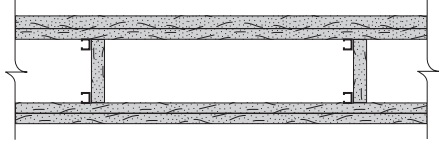
Face Layer: 5/8" (15.9 mm) ToughRock Fireguard gypsum board applied parallel to each side. Vertical joints midway between studs. Face layer attached to base layer only with 1-1/2" (38 mm) Type G drywall screws 12" (305 mm) o.c. at vertical joints and center line of face layer gypsum board. 3/8" (10 mm) to 1/2" (13 mm) diameter adhesive beads around the perimeter of face board, 2" (51 mm) from each edge and end, and in the form of an X joining the corners of the perimeter beads are optional. Joints staggered 24" (610 mm) each layer and side.

CAUTION: For important fire, safety and use information, go to page 7.

Steel-Framed Wall Assemblies *continued*

2-Hour Fire Rating

Test Reference: UL U420, GA WP 5105, cUL U420



55-59 STC Sound Trans.

Test Reference: RAL TL76-156

Partition Thickness: 12" (305 mm), Weight per Sq. Ft.: 10.0 (49 kg/m²)

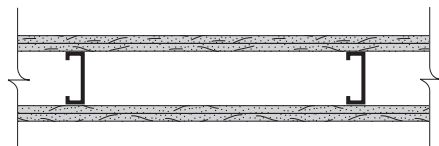
Sound Tested with 3-1/2" (89 mm) fiberglass insulation stapled in stud space

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® applied parallel to a double row of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. and not less than 1" (25 mm) apart with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. at edges and 12" (305 mm) o.c. at intermediate studs. 5/8" (15.9 mm) gypsum board pieces 12" (305 mm) long x not less than 4-1/2" (114 mm) wide located at 1/3 points used as cross braces fastened to stud pairs with three 1" (25 mm) Type S drywall screws at each end of brace. Optionally 25-gauge (18 mils) stud or runner pieces, not less than 4-1/2" (114 mm) long, may be used as cross braces and attached with two No. 8 x 1/2" (13 mm) self-drilling steel screws at each end. Where total cavity depth exceeds 9-1/2" (241 mm), cross braces shall be fabricated with 25-gauge (18 mils) stud or runner pieces.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 8" (203 mm) o.c. at joints and floor and ceiling runners and 12" (305 mm) o.c. at intermediate studs.

2-Hour Fire Rating

Test Reference UL U425, GA WP 1716, cUL U425



40-44 STC Sound Trans

Test Reference: NGC 2250

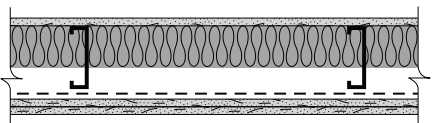
Partition Thickness: 6" (152 mm), Weight per Sq. Ft: 10 (49 kg/m²)

Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side of 3-1/2" (89 mm) 20-gauge (30 mils) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S-12 drywall screws 12" (305 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S-12 drywall screws 12" (305 mm) o.c. Studs attached to each side of the floor and ceiling runners by welding or with 1/2" (12.7 mm) Type S-12 panhead screws. Joints staggered 24" (610 mm) each layer and side. Limited load bearing (80% load bearing).

2-Hour Fire Rating

Test Reference: UL U453, GA WP 1520, cUL 453



55-59 STC Sound Trans.

Test Reference: RAL TL83-215

Partition Thickness: 5-7/8" (149 mm), Weight per Sq. Ft.: 9.0 (44 kg/m²)

25-gauge (18 mils) resilient channels 24" (610 mm) o.c. attached at right angles to one side of 3-1/2" (89 mm) 20-gauge (30 mils) steel studs 24" (610 mm) o.c. with one 1/2" (13 mm) Type S-12 drywall screw at each stud.

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied at right angles to channels with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to channels with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. 3" (76 mm) mineral fiber insulation, friction fit in stud space.

Opposite Side: One layer 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to studs with 1" (25 mm) Type S-12 drywall screws 12" (305 mm) o.c. Joints staggered 24" (610 mm) each layer and side.

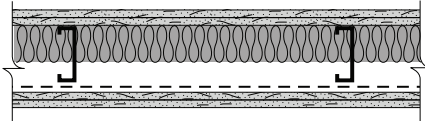
CAUTION: For important fire, safety and use information, go to page 7.

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Steel-Framed Wall Assemblies *continued*

2-Hour Fire Rating

Test Reference: UL U454, GA WP 1470



55-59 STC Sound Trans.

Test Reference: RAL TL83-214

Partition Thickness: 6-1/2" (165 mm), Weight per Sq. Ft.: 12.0 (59 kg/m²)

Resilient channels 24" (610 mm) o.c. attached at right angles to one side of 2-1/2" (64 mm) 20-gauge (30 mils) steel studs 24" (610 mm) o.c. with one 1/2" (12.7 mm) Type S drywall screw at each stud.

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied at right angles to channels with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

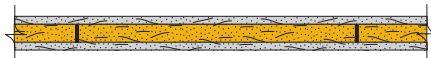
Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to channels with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. 3" (76 mm) mineral fiber insulation, 2 pcf (32 kg/m³), friction fit in stud space.

Opposite Side Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied parallel to studs with 1-5/8" (41 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Joints staggered.

2-Hour Fire Rating

Test Reference: OSU T-1339



35-39 STC Sound Trans.

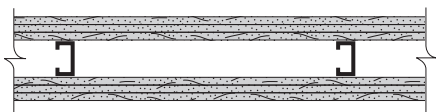
Test Reference: NGC 2359

Partition Thickness: 2" (51 mm), Weight per Sq. Ft.: 9.0 (44 kg/m²)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied parallel to each side of 1" (25.4 mm) DensGlass® Shaftliner Fireguard® with laminating compound combed over entire surface. Floor and ceiling track of wood or steel runners. Joints staggered.

3-Hour Fire Rating

Test Reference: WHI-495-0785 & 0789



50-54 STC Sound Trans.

Test Reference: WEAL 87-118

Partition Thickness: 4-5/8" (118 mm), Weight per Sq. Ft.: 13.0 (64 kg/m²)

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side of 1-5/8" (41 mm) metal studs 24" (610 mm) o.c. with joints staggered 24" (610 mm) each side using 1" (25 mm) Type S drywall screws 12" (305 mm) o.c.

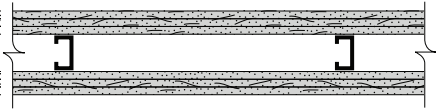
Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with joints 8" (203 mm) from studs staggered 24" (610 mm) each side attached to studs with 1-5/8" (41 mm) Type S drywall screws 24" (610 mm) o.c. and to base layer with 1-1/2" (38 mm) Type G drywall screws 12" (305 mm) o.c. spaced 1-1/2" (38 mm) from vertical edges.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied at right angles to each side joints offset 24" (610 mm) and attached to studs with 2" (51 mm) Type S drywall screws 12" (305 mm) o.c. and with 1-1/2" (38 mm) Type G drywall screws 24" (610 mm) o.c. and 1-1/2" (38 mm) from horizontal joints at midpoint between studs. Sound tested with 1-1/2" (38 mm) fiberglass insulation.

Steel-Framed Wall Assemblies continued

3-Hour Fire Rating

Test Reference: UL U435, GA WP 2922



50-54 STC Sound Trans.

Test Reference: WEAL 87-118

Partition Thickness: 4-5/8" (118 mm), Weight per Sq. Ft.: 13.0 (64 kg/m²)

Sound Tested with 1-1/2" (38 mm) glass fiber insulation, friction fit in stud space

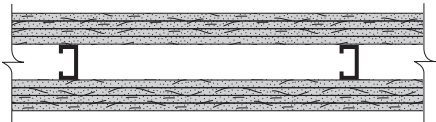
Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ gypsum board applied parallel to each side of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 36" (914 mm) o.c.

Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel or at right angles to each side with 2-1/4" (57 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/2" (38 mm) Type G drywall screws midway between studs 1-1/2" (38 mm) above and below horizontal joints. Joints staggered.

4-Hour Fire Rating

Test Reference: WHI-495-0786 & 0787



55-59 STC Sound Trans.

Test Reference: WEAL 87-119

Partition Thickness: 5-5/8" (143 mm), Weight per Sq. Ft.: 18.0 (88 kg/m²)

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side of 1-5/8" (41 mm) metal studs 24" (610 mm) o.c. with joints staggered 24" (610 mm) each side using 1" (25 mm) Type S drywall screws 12" (305 mm) o.c.

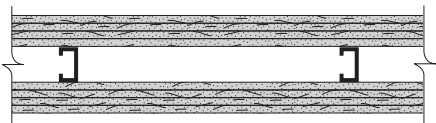
Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with joints staggered 24" (610 mm) each side attached to studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c.

Third Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with joints offset 8" (203 mm) from studs and staggered 24" (610 mm) each side, attached to studs with 2" (51 mm) Type S drywall screws 24" (610 mm) o.c. and with 1-1/2" (38 mm) Type G drywall screws 12" (305 mm) o.c. between studs 1-1/2" (38 mm) from joints.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board installed at right angles on each side with joints staggered 24" (610 mm) o.c. Install 2-1/2" (64 mm) Type S drywall screws 12" (305 mm) o.c. to studs and track and 1-1/2" (38 mm) Type G drywall screws 24" (610 mm) o.c. and 1-1/2" (38 mm) from horizontal joints at midpoint between framing. Sound tested with 1-1/2" (38 mm) fiberglass insulation.

4-Hour Fire Rating

Test Reference: UL U435, GA WP 2961



55-59 STC Sound Trans.

Test Reference: WEAL 87-119

Partition Thickness: 5-5/8" (143 mm), Weight per Sq. Ft.: 18.0 (88 kg/m²)

Sound Tested with 1-1/2" (38 mm) glass fiber insulation, friction fit in stud space

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C™ gypsum board applied parallel to each side of 1-5/8" (41 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 48" (1220 mm) o.c.

Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with 1-5/8" (41 mm) Type S drywall screws 36" (914 mm) o.c.

Third Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied parallel to each side with 2-1/4" (57 mm) Type S drywall screws 24" (610 mm) o.c. and 1-1/2" (38 mm) Type G drywall screws midway between studs 36" (914 mm) o.c. vertically.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied at right angles to each side with 2-5/8" (67 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/2" (38 mm) Type G drywall screws midway between studs 1-1/2" (38 mm) above and below horizontal joints. Joints staggered 24" (610 mm) each layer and side.

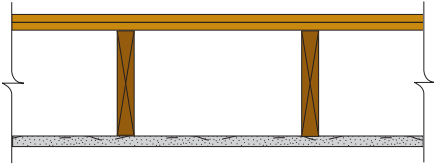
CAUTION: For important fire, safety and use information, go to page 7.

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Floor/Ceiling Wood-Framed Assemblies

1-Hour Fire Rating

Test Reference: UL L501, ULC M500,
GA FC 5420



35-39 STC Sound Trans. Test Reference: NGC 4024

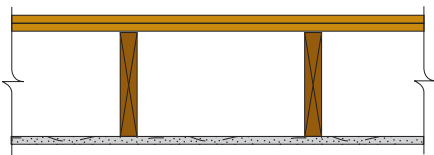
IIC 32 Test Reference: NGC 5032

Weight per Sq. Ft.: 2.5 (12 kg/m²)

5/8" (15.9 mm) ToughRock® Fireguard® gypsum board applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 1-7/8" (48 mm) 6d nails 6" (152 mm) o.c. Wood joists supporting 1" (25.4 mm) nominal wood sub and 1" (25.4 mm) nominal finish floor, or 19/32" (15.1 mm) plywood finished floor with long edges T&G and 15/32" (11.9 mm) interior plywood with exterior glue subfloor perpendicular to joists with joints staggered.

1-Hour Fire Rating

Test Reference: UL L503, ULC M502,
GA FC 5410, cUL L503



35-39 STC Sound Trans. Test Reference: NGC 4024

IIC 32 Test Reference: NGC 5032

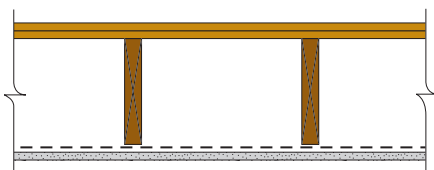
IIC 66 with carpet and pad Test Reference: NGC 5032

Weight per Sq. Ft.: 2.0 (10 kg/m²)

1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 5d nails 1-5/8" (41 mm) long, 0.099" (2.5 mm) shank, 1/4" (6 mm) heads, 6" (152 mm) o.c. Wood joists supporting 1" (25 mm) nominal T&G wood sub and 1" (25 mm) nominal finish floor, or 19/32" (15.1 mm) plywood finished floor with long edges T&G and 15/32" (11.9 mm) interior plywood with exterior glue subfloor perpendicular to joists with joints staggered. Nails placed 3/4" (19 mm) from board end joints and 1/2" (12.7 mm) from board end joints.

1-Hour Fire Rating

Test Reference: UL L502, ULC M501,
GA FC 5250, cUL L502



45-49 STC Sound Trans.

Test Reference: RAL TL64-155

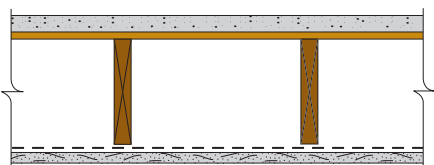
IIC 67 with carpet and pad Test Reference: CK 6512-6

Weight per Sq. Ft.: 2.0 (10 kg/m²)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 60" (1524 mm) long with screws 12" (305 mm) o.c. Resilient channels applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 2" (51 mm) 6d coated nails. Wood joists supporting 1" (25.4 mm) nominal wood subfloor and 1" (25.4 mm) nominal wood finish floor, or 19/32" (15.1 mm) plywood finished floor with long edges T&G and 15/32" (11.9 mm) interior plywood with exterior glue subfloor perpendicular to joist with joints staggered.

1-Hour Fire Rating

Test Reference: UL L502, GA FC 5105,
cUL L502



55-59 STC Sound Trans.

Test Reference: G&H BW-10 MT

IIC 73 with carpet and pad Test Reference: G&H BW-10 MT

Weight per Sq. Ft.: 2.0 (10 kg/m²)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation in joist spaces and with carpet and pad (2nd layer of drywall needed with insulation)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to resilient channels 24 o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 60" (1524 mm) long with screws 12" (305 mm) o.c. Resilient channels applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 6d common nails. Wood joists supporting 19/32" (15.1 mm) plywood and 1" (25 mm) proprietary sanded gypsum underlayment.

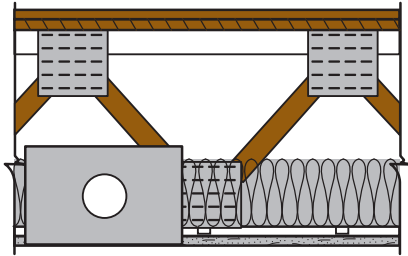
CAUTION: For important fire, safety and use information, go to page 7.

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Floor/Ceiling Wood-Framed Assemblies *continued*

1-Hour Fire Rating

Test Reference: UL M503, cUL M503

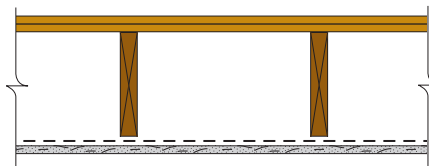


Weight per Sq. Ft.: 3.0 (15 kg/m²)

5/8" (15.9 mm) ToughRock® Fireguard C™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard C™ gypsum board applied perpendicular to resilient channels 24" (610 mm) o.c. Gypsum board secured with 1" (25 mm) long Type S bugle head steel screws. Screws spaced 1/2" (12.7 mm) and 6" (152 mm) from side joints and 12" (305 mm) o.c. in the rest of the field. Screws spaced 3" (76 mm) from the stud joints. End joints secured to both resilient channels. When batt insulation is draped over the resilient channel/gypsum board ceiling membrane, screws spaced 1/2" (12.7 mm) and 4" (102 mm) from side joints and 8" (203 mm) oc. to the rest of the field.

1-Hour Fire Rating

Test Reference: GA FC 5240, ULC M501, UL L514, cUL L514



45-49 STC Sound Trans.

IIC 39

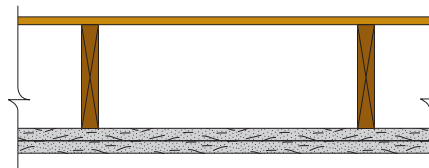
IIC 67 with carpet and pad Test Reference: CK 6512-6, 7

Weight per Sq. Ft.: 3.0 (15 kg/m²)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to resilient channels 24" o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 54" (1372 mm) long with screws 12" (305 mm) o.c. Resilient channels applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 1-1/4" (32 mm) Type W drywall screws. Wood joists supporting 1" (25 mm) nominal T&G wood subfloor and 1" (25.4 mm) nominal wood finish floor, or 19/32" (15.1 mm) plywood finished floor with long edges T&G and 15/32" (11.9 mm) interior plywood with exterior glue subfloor perpendicular to joists with joints staggered.

1-Hour Fire Rating

Test Reference: FM FC 172, GA FC 5406



35-39 STC Sound Trans.

Test Reference: Est.

Weight per Sq. Ft.: 5.0 (24 kg/m²)

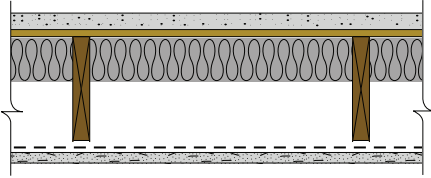
Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied at right angles to 2 x 10 wood joists 24" (610 mm) o.c. with 1-1/4" (32 mm) drywall screws 24" (610 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to joists through base layer with 1-7/8" (48 mm) Type W or S screws 12" (305 mm) o.c. at joints and intermediate joists. Face layer joints offset 24" (610 mm) from base layer joints, 1-1/2" (38 mm) Type G drywall screws placed 2" (51 mm) back on either side of face layer end joints 12" (305 mm) o.c. Wood joist supporting 1/2" (12.7 mm) plywood with exterior glue applied at right angles to top of joists with 8d nails. **Ceiling provides one-hour fire resistance protection for framing, including trusses.**

Floor/Ceiling Wood-Framed Assemblies *continued*

1-Hour Fire Rating

Test Reference: UL L516, cUL L516



50-54 STC Sound Trans.

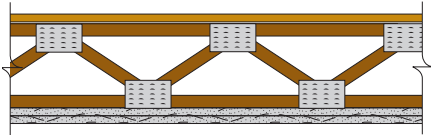
IIC 74 Test Reference: KAL L224 27-65

Weight per Sq. Ft.: 2.5 (12 kg/m²)

5/8" (15.9 mm) ToughRock® Fireguard C™ gypsum board applied at right angles to resilient channels 24" o.c. (610 mm) with 1" (25.4 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 54" (1372 mm) long with screws 12" (305 mm) o.c. Resilient channels applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 1-1/4" (32 mm) drywall screws. Wood joists supporting 5/8" (15.9 mm) interior plywood with exterior glue subfloor and 1-5/8" (41.3 mm) perlite-sand concrete reinforced with No. 19 SWG galvanized hexagonal wire mesh. 3" (76 mm) glass fiber insulation 0.90 pcf (14.4 kg/m³) in joist space stapled to subfloor.

1-Hour Fire Rating

Test Reference: FM FC 214, GA FC 5512



Weight per Sq. Ft.: 4.0 (20 kg/m²)

Ceiling Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied perpendicular to wood trusses 24" (610 mm) o.c. with 1-1/4" (32 mm) Type S drywall screws 24" (610 mm) o.c.

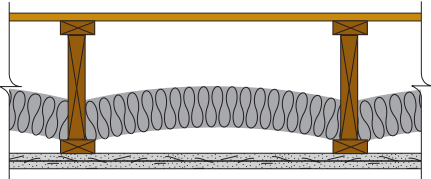
Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular to trusses with 1-7/8" (48 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/2" (38 mm) Type G drywall screws 12" (305 mm) o.c. placed 3" (76 mm) back from either side of end joints. Joints offset 24" (610 mm) from base layer joints.

Trusses: Chord and web members fabricated from 2 x 4 lumber with 20-gauge (30 mils) steel connector plates having a minimum tooth length of 5/16" (7.9 mm). Plate design values based upon safety factor of 4. Trusses have a minimum depth of 12" (305 mm).

Flooring: 19/32" (15.1 mm) T&G plywood with exterior glue applied at right angles to top of trusses with 6d common nails 6" (152 mm) o.c. Plywood end joints staggered 48" (1219 mm).

1-Hour Fire Rating

Test Reference: WHI 694 0090



Weight per Sq. Ft.: 4.0 (20 kg/m²)

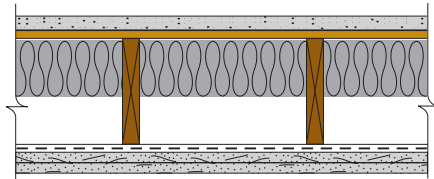
Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied perpendicular to 11-3/8" (290 mm) deep, W143, wood I joists 24" (610 mm) o.c. with 1-1/4" (32 mm) Type S screws 16" (406 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied perpendicular to joists with 1-7/8" (48 mm) Type S screws 12" (305 mm) o.c. at all joists. Stagger joints 24" (610 mm) o.c. At end joints place additional 1-1/2" (38 mm) Type G screws 12" (305 mm) o.c. and 2" (51 mm) in from each side of end joints. Wood I joists support 3/4" (19 mm) T&G plywood perpendicular to joists with 1/4" (6 mm) bead construction adhesive and 2-1/2" (64 mm) 8d nails 8" (203 mm) o.c. Cavity at lower chord filled with 3-1/2" (89 mm) fiberglass insulation supported by wire insulation supports.

Floor/Ceiling Wood-Framed Assemblies *continued*

1-1/2-Hour Fire Rating

Test Reference: UL L532, GA FC 5600, cUL L532



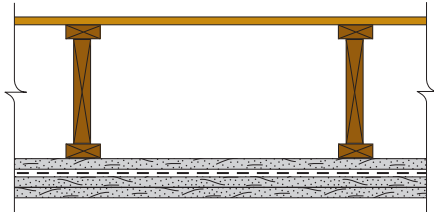
Weight per Sq. Ft.: 5.0 (24 kg/m²)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied at right angles to 25-gauge (18 mils) drywall rigid furring channels 16" (406 mm) o.c. with 1" (25 mm) Type S screws 12" (305 mm) o.c. Drywall end joints located midway between continuous channels and attached to additional pieces of channel 60" (1524 mm) long with 1" (25 mm) Type S screws 8" (203 mm) o.c. Rigid furring channels 16" (406 mm) o.c. at right angles to 2 x 10 wood joists 16" (406 mm) o.c. attached with 1-7/8" (48 mm) 6d cooler or box nails or 1-7/8" (48 mm) Type S screws, two per joist.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied at right angles to resilient channels through base layer with 1-7/8" (48 mm) Type S screws 12" (305 mm) o.c. Face layer wallboard end joints attached to continuous channels through base layer with 1-7/8" (48 mm) Type S screws 8" (203 mm) o.c. Face layer wallboard edge joints staggered 18" (457 mm) minimum from base layer edge joints; end joints staggered 8" (203 mm) min. from base layer joints. Wood joists supporting 5/8" (15.9 mm) interior plywood with exterior glue subfloor and 1-1/2" (38 mm) lightweight concrete reinforced with galvanized hexagonal wire mesh over film or felt or 1" (25 mm) sanded gypsum floor underlayment. 3-1/2" (89 mm) unfaced fiberglass insulation, nom. 0.6 pcf (9.6 kg/m³), R-11 supported against subfloor by wire rods 12" (305 mm) o.c. Alternately, insulation may be 3-1/2" (89 mm) faced fiberglass insulation stapled in place against subfloor.

2-Hour Fire Rating

Test Reference: UL L538, cUL L538



Weight per Sq. Ft.: 8.0 (39 kg/m²)

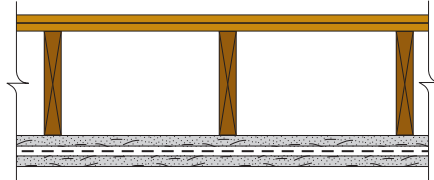
Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard C™ gypsum board applied at right angles to I-shaped wood joists or wood and steel trusses, spaced 19.2" (488 mm) o.c. maximum, with 1-5/8" (41 mm) Type S drywall screws, 8" (203 mm) o.c. Resilient channels attached 16" (406 mm) o.c. through base layer at right angles to joists or trusses with 1-7/8" (48 mm) Type S drywall screws.

Middle Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied at right angles to resilient channels with 1" (25.4 mm) Type S drywall screws 8" (203.2 mm) o.c. Screws located 1-1/2" (38 mm) to 2" (51 mm) and 5/8" (15.9 mm) to 3/4" (19 mm) from side and end joints respectively.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied at right angles to channels with 1-5/8" (41 mm) Type S drywall screws, 8" (203 mm) o.c. Joints in the face layer are offset 16" (406 mm) from those in the middle layer. 5/8" (15.9 mm) T&G plywood floor at right angles to joists with adhesives and 8d cement coated nails 12" (305 mm) o.c.

2-Hour Fire Rating

Test Reference: UL L505, ULC M503, GA FC 5724



Weight per Sq. Ft.: 6.0 (29 kg/m²)

Base Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied at right angles to 2 x 10 wood joists 16" (406 mm) o.c. with 2-1/2" (64 mm) 8d cement coated nails 7" (178 mm) o.c. Resilient channel 24" (610 mm) o.c. applied at right angles to wood framing through base layer with 2-1/2" (64 mm) long screws. Double channel installed at face layer end joints.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied at right angles to resilient channels with 1" (25 mm) Type S screws 12" (305 mm) o.c. Wood joists supporting 1" (25.4 mm) nominal T&G wood subfloor and 1" (25 mm) nominal wood finish floor or 15/32" (11.9 mm) plywood subfloor and 19/32" (15.1 mm) plywood finish floor applied at right angles to joists with joints staggered.

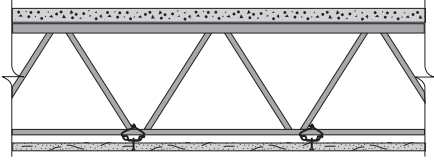
CAUTION: For important fire, safety and use information, go to page 7.

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Floor/Ceiling Steel-Framed Assemblies

1-1/2-Hour Fire Rating

Test Reference: UL G502, ULC I510,
GA FC 1110

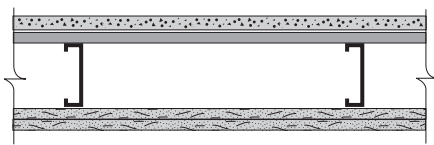


Weight per Sq. Ft.: 2.0 (10 kg/m²)

1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied at right angles to rigid resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S screws 12" (305 mm) o.c. in field. Drywall end joints located midway between continuous channels and attached to additional pieces of channel 52" (1321 mm) long with screws 8" (203 mm) o.c. Furring channels wire tied to open web steel joists 24" (610 mm) o.c. supporting 3/8" (10 mm) rib steel lath or 9/16" (14 mm) deep 28-gauge (15 mils) corrugated steel and 2" (51 mm) concrete slab measured from top of flute. (Passed 90-minute fire test restrained and unrestrained.)

2-Hour Fire Rating

Test Reference: FM FC 224-2, GA FC 2116



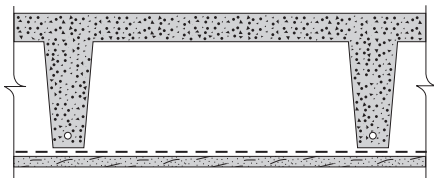
Weight per Sq. Ft.: 5.0 (24 kg/m²)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard® gypsum board applied at right angles to channel, minimum 7-1/4" (184 mm) deep, 18-gauge (43 mils) galvanized steel joists 24" (610 mm) o.c. with 1" (25 mm) Type S-12 drywall screws 12" (305 mm) o.c. End joints located midway between joists and staggered between rows.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard gypsum board applied at right angles to joists with 1-7/8" (48 mm) Type S-12 drywall screws 12" (305 mm) o.c. placed 2" (51 mm) from edges and 1-1/2" (38 mm) Type G drywall screws 12" (305 mm) o.c. placed 2" (51 mm) back on either side of end joints. End joints located midway between joists and all joints offset 24" (610 mm) from base layer joints. Joists supporting 28-gauge (15 mils) corrugated steel deck and 2-1/2" (64 mm) concrete slab measured from the bottom of the flutes. Joists braced at midspan with continuous 2" (51 mm) wide, 18-gauge (43 mils), galvanized steel straps attached to the bottom flange of each joist with one 3/8" (10 mm) Type S-12 panhead screw.

2-Hour Fire Rating

Test Reference: PCA 1281-1, GA FC 2120

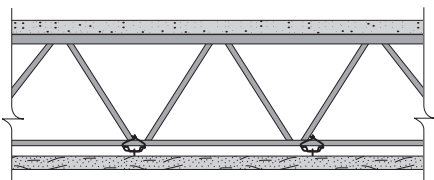


Weight per Sq. Ft.: 3.0 (15 kg/m²)

5/8" (15.9 mm) ToughRock Fireguard gypsum board applied at right angles to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. Gypsum board end joints located over continuous channels and attached to additional pieces of channel 54" (1372 mm) long located midway between continuous channels at end joints. Resilient channels 24" (610 mm) o.c. suspended from 2-1/2" (64 mm) precast reinforced concrete joists 35" (89 mm) o.c. with 21-gauge (37 mils) galvanized steel hanger straps fastened to sides of joists. Joist leg depth, 10" (254 mm).

2-Hour Fire Rating

Test Reference: UL G505, ULC I512,
GA FC 2130



Weight per Sq. Ft.: 2.5 (12 kg/m²)

5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied at right angles to rigid furring channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Drywall end joints located midway between continuous channels and attached to additional pieces of channel 62" (1575 mm) long with screws 12" (305 mm) o.c. Furring channels attached with 18-gauge (43 mils) wire ties to open web steel joists 24" (610 mm) o.c. supporting 3/8" (10 mm) rib steel lath and 2" (51 mm) concrete slab. (Two hours restrained and unrestrained.)

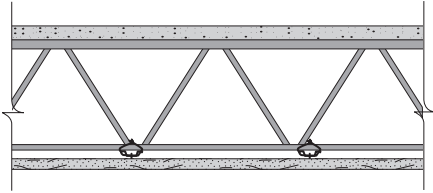
CAUTION: For important fire, safety and use information, go to page 7.

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Floor/Ceiling Steel-Framed Assemblies *continued*

2-Hour Fire Rating

Test Reference: UL G504, ULC I507

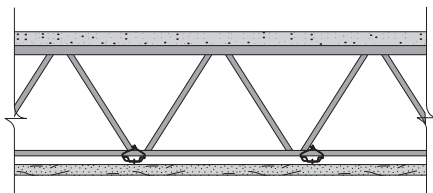


Weight per Sq. Ft.: 2.0 (10 kg/m²)

1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board applied at right angles to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. in field. Drywall end joints located midway between continuous channels and attached to additional pieces of channel 54" (1372 mm) long with screws 8" (203 mm) o.c. Resilient channels wire tied 24" (610 mm) o.c. to open web steel joists supporting 3/8" (10 mm) rib steel lath or 9/16" (14 mm) deep 28-gauge (15 mils) corrugated steel and 2-1/2" (64 mm) concrete slab measured from top of flute.

2-Hour Fire Rating

Test Reference: ULC I511, GA FC 2030



50-54 STC Sound Trans.

Test Reference: NGC 4075

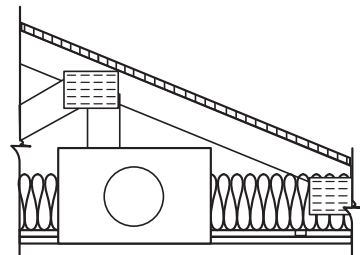
Weight per Sq. Ft.: 2.0 (10 kg/m²)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied at right angles to rigid furring channel 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channel 54" (1372 mm) long with screws at 12" (305 mm) o.c. Furring channels 24" (610 mm) o.c. attached with 18-gauge (43 mils) wire tied 48" (1219 mm) o.c. to open web steel joists 24" (610 mm) o.c. supporting 9/16" (14 mm) deep 28-gauge (15 mils) corrugated steel and 2-1/2" (64 mm) concrete slab. Furring channels may be attached to 1-1/2" (38 mm) cold rolled channels 48" (1219 mm) o.c. suspended from joists by 8-gauge wire hangers not more than 48" (1219 mm) o.c. (Two hour restrained and unrestrained.)

Roof/Ceiling Wood-Framed Assemblies

1-Hour Fire Rating

Test Reference: UL P552, cUL P552

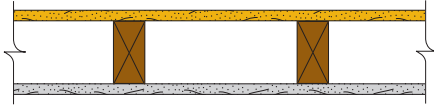


5/8" (15.9 mm) ToughRock Fireguard C or 5/8" (15.9 mm) DensArmor Plus Fireguard C applied perpendicular to the resilient channels spaced 16" (406 mm) o.c. with 1" (25 mm) Type S screws 12" (305 mm) o.c. Space channels 12" (305 mm) o.c. when insulation is draped over channels. End joints attached with screws 8" (203 mm) o.c. attached to pieces of channel 60" (1524 mm) long located 3" (76 mm) back from either side of the end joint. Resilient channel applied perpendicularly to the bottom of the wood trusses 24" (610 mm) o.c. with 1-1/4" (32 mm) Type S screws. Glass fiber insulation attached to wood panels or draped over channels. Trusses supporting 15/32" (405 mm) wood structural panels applied perpendicular to trusses with adhesive and 6d ring shank nails 12" (305 mm) o.c. Optional ceiling damper (refer to damper manufacturer for damper type).

Exterior Wood-Framed Wall Assemblies

1-Hour Fire Rating

Test Reference: UL U305, cUL U305, ULC W301



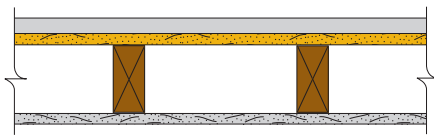
Partition Thickness: 4-3/4 (121 mm), Weight per Sq. Ft.: 7.5 (37 kg/m²)

Exterior Side: 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing applied parallel or at right angles to 2 x 4 wood studs 16" (406 mm) o.c. with 1-3/4" (45 mm) galvanized roofing nails 7" (178 mm) o.c. Exterior surface covered with weather exposed cladding or finish system.

Interior Side: One layer 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied parallel or at right angles to studs with 1-7/8" (48 mm) 6d coated 7" (178 mm) o.c. Stagger joints each side.

1-Hour Fire Rating

Test Reference: UL U309, GA WP 8109, cUL U309



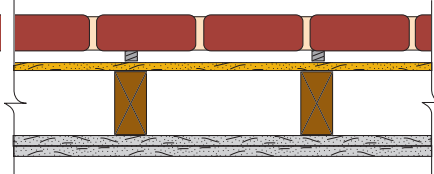
Partition Thickness: Varies, Weight per Sq. Ft.: 9.0 (44 kg/m²)

Exterior Side: 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied parallel or at right angles to 2 x 4 wood studs 24" (610 mm) o.c. with 1-7/8" (48 mm) galvanized roofing nails 7" (178 mm) o.c. Joints of gypsum sheathing may be left untreated. Exterior cladding to be attached through sheathing to studs.

Interior Side: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to studs with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c.

2-Hour Fire Rating

Test Reference: UL U302, ULC U302, GA WP 8410



Wall Thickness: 10-1/8" (3051 mm)

Interior Base Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to 2 x 4 wood studs 16" (406 mm) o.c. with 1-7/8" (48 mm) 6d coated nails 8" (203 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel or at right angles to studs with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c.

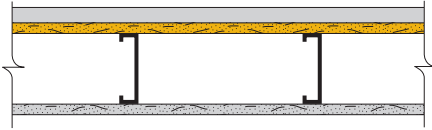
Exterior Base Layer: 1/2" (12.7 mm) DensGlass® Sheathing applied parallel or at right angles to studs with 1-3/4" (45 mm) galvanized roofing nails 6" (152 mm) o.c.

Face Layer: 2" x 4" x 8" (51 x 102 x 203 mm) clay brick with 1" (25.4 mm) air space between brick and exterior sheathing. 20-gauge (30 mils) galvanized wire ties attached to each stud with 2-3/8" (60 mm) 8d coated nails, located at every sixth course of bricks.

Exterior Steel-Framed Wall Assemblies

1-Hour Fire Rating

Test Reference: SWRI 01-4409-003,
GA WP 8122



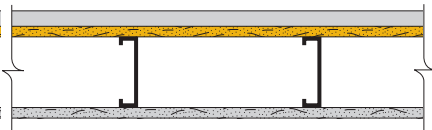
Partition Thickness: 6"–7" (152 mm – 178 mm), varies based on insulation thickness
Weight per Sq. Ft.: 7.0 (34 kg/m²)

Exterior Side: 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing applied parallel to 3-5/8" (92 mm) 18-gauge (43 mils) steel studs 16" (406 mm) o.c. with #6 x 1-1/4" (32 mm) self-drilling, corrosion-resistant, bugle head, drywall screws 8" (203 mm) o.c. at edges and ends and 8" (203 mm) o.c. at intermediate studs. Proprietary polymer modified exterior insulation and finish system applied over sheathing. 2" (51 mm) maximum foam-on-plastic thickness.

Interior Side: 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied parallel to studs with #6 x 1-1/4" (32 mm) self-drilling, bugle head drywall screws 8" (203 mm) o.c. at edges and ends and 12" (305 mm) o.c. at intermediate studs.

1-Hour Fire Rating

Test Reference: SWRI 01-4409-001,
GA WP 8123



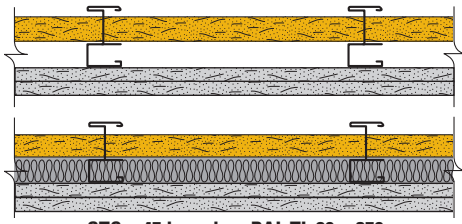
Partition Thickness: 6"–9" (152 mm – 229 mm), varies based on insulation thickness
Weight per Sq. Ft.: 7.0 (34 kg/m²)

Exterior Side: 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied parallel to 3-5/8" (92 mm) 18-gauge (43 mils) steel studs 24" (610 mm) o.c. with #6 x 1-1/4" (32 mm) self-drilling, corrosion-resistant, bugle head drywall screws 8" (203 mm) o.c. at edges and ends and 8" (203 mm) o.c. at intermediate studs. Polymer-based exterior insulation and finish system applied over sheathing. 4" (102 mm) maximum foam-on-plastic thickness.

Interior Side: One layer 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied parallel to studs with #6 x 1-1/4" (32 mm) self-drilling, bugle head drywall screws 8" (203 mm) o.c. at edges and ends and 12" (305 mm) o.c. at intermediate studs.

Design Summary Vertical – Shaftwall Assemblies

2-Hour Fire Rating



STC = 47 based on RAL TL 89 – 379

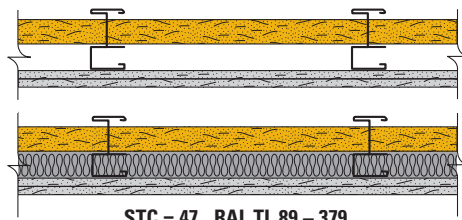
Test Reference: UL V473, cUL V473

Approx. Weight: 10 psf (49 kg/m²)

Fiberglass sound insulation thickness is 1" (25.4 mm), 2-1/2" (64 mm) and 3-1/2" (89 mm) for C-T or C-H studs of 2-1/2" (64 mm), 4" (102 mm) and 6" (152 mm) respectively. Finished one side. Components: 1" (25.4 mm) DensGlass® Shaftliner panel, C-T or C-H studs and two layers of 5/8" (15.9 mm) DensArmor Plus® Fireguard® or 5/8" (15.9 mm) ToughRock® Fireguard® gypsum board installed horizontally for base layer and vertically for face layer. Edges and ends offset 24" (610 mm) o.c.

C-T or C-H Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	3-3/4" (95 mm)	5-1/4" (133 mm)	7-1/4" (184 mm)

Series 620 2-Hour Fire Rating



STC = 47 RAL TL 89 – 379

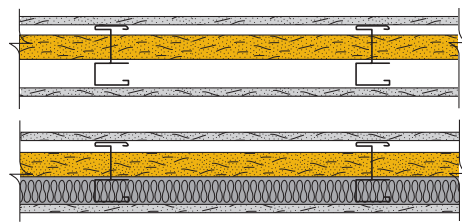
Test Reference: GA WP 7074, WHI Design GP/WA 120-01

Approx. Weight: 9 psf (44 kg/m²)

Fiberglass sound insulation thickness is 1" (25 mm), 2-1/2" (64 mm) and 3-1/2" (89 mm) for C-T, C-H or I studs of 2-1/2" (64 mm), 4" (102 mm) and 6" (152 mm) respectively. Finished one side. Components: 1" (25.4 mm) DensGlass Shaftliner panel, C-T studs and two layers of 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ or 1/2" (12.7 mm) ToughRock® Fireguard C™ gypsum board installed horizontally for base layer and vertically for face layer. Edges and ends offset 24" (610 mm) o.c.

C-T, C-H or I Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	3-1/2" (89 mm)	5" (127 mm)	7" (178 mm)

Series 621 2-Hour Fire Rating



STC = 45 RAL TL 89 – 380

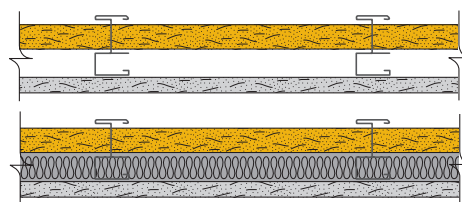
Test Reference: GA WP 7073, WHI Design GP/WA 120-02

Approx. Weight: 9 psf (44 kg/m²)

Fiberglass sound insulation thickness is 1" (25 mm), 2-1/2" (64 mm) and 3-1/2" (89 mm) for C-T, C-H or I studs of 2-1/2" (64 mm), 4" (102 mm) and 6" (152 mm) respectively. Finished both sides with 1/2" (12.7 mm) DensArmor Plus Fireguard C or 1/2" (12.7 mm) ToughRock Fireguard C gypsum board installed horizontally or vertically. Edges and ends offset 24" (610 mm) o.c.

C-T, C-H or I Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	3-1/2" (89 mm)	5" (127 mm)	7" (178 mm)

Series 622 1-Hour Fire Rating



STC = 39, est.

Test Reference: GA WP 7001, WHI Design GP/WA 60-01

Approx. Weight: 7 psf (34 kg/m²)

Fiberglass sound insulation thickness is 1" (25 mm), 2-1/2" (64 mm) and 3-1/2" (89 mm) for C-T, C-H or I studs of 2-1/2" (64 mm), 4" (102 mm) and 6" (152 mm) respectively. Finished one side. Components: 1" (25.4 mm) DensGlass Shaftliner panel, studs and one layer of 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard® gypsum board installed vertically.

C-T, C-H or I Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	3-1/8" (80 mm)	4-5/8" (118 mm)	6-5/8" (168 mm)

Design Summary Horizontal – Shaftwall Assemblies

<p>Series 623 2-Hour Fire Rating</p>	<p>Test Reference: WHI-495-PSH-0128 Approx. Weight: 11 psf (54 kg/m²) Designed for ceiling or duct shaft and composed of 1" (25.4 mm) DensGlass® Shaftliner panel supported by 2-1/2" (64 mm), 4" (102 mm) or 6" (152 mm) C-T studs and three layers of 1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board.</p>
<p>Series 624 2-Hour Fire Rating</p>	<p>Test Reference: WHI-495-PSH-0153 & WHI-495-PSH-0197 Approx. Weight: 11 psf (54 kg/m²) Designed to separate a room from structure or space above and composed of 1" (25.4 mm) DensGlass Shaftliner panel supported by 2-1/2" (64 mm), 4" (102 mm) or 6" (152 mm) C-T studs and three layers of 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board.</p>
<p>Series 627 2-Hour Fire Rating</p>	<p>Test Reference: WHI-495-PSH-0183 & WHI-495-PSH-0196, WHI Design GP/CC 120-01 Approx. Weight: 11 psf (54 kg/m²) Designed to separate a room from structure or space above and composed of 1" (25.4 mm) DensGlass Shaftliner panel supported by 2-1/2" (64 mm), 4" (102 mm) or 6" (152 mm) C-T studs and three layers of 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board.</p>

System Assemblies – 2-Hour Ratings – Area Separation Walls

Construction Detail	Assembly Components	STC	Test Reference
	<p>Two layers 1" (25.4 mm) DensGlass Shaftliner inserted in H-Studs 24" (610 mm) o.c. Min. 3/4" (19 mm) air space between liner panels and adjacent wood or metal framing.</p>	60	<p>UL U373 ULC W312 WHI GP/WA 120-03 RAL TL89-383</p>
	<p>Two layers 1" (25.4 mm) DensGlass Shaftliner inserted in H-Studs 24" (610 mm) o.c. Min. 3/4" (19 mm) air space on both sides must be maintained between liner panels and adjacent framing. Sound Tested with 2 x 4 stud wall with 1/2" (12.7 mm) DensArmor Plus® interior panels each side of assembly and 3-1/2" (89 mm) fiberglass insulation in stud space both sides.</p>	60	<p>UL U373 ULC W312 WHI GP/WA 120-04 Based on RAL TL89-383</p>
	<p>Part. Thickness: 3" (76 mm) Weight per Sq. Ft.: 9.5 (46 kg/m²) Two layers 1" (25.4 mm) DensGlass® Fireguard® Shaftliner inserted in H-Studs 24" (610 mm) o.c. Metal covered using 6" (152 mm) wide 1/2" (12.7 mm) DensArmor Plus Fireguard C Interior Panel or 1/2" (12.7 mm) ToughRock Fireguard C gypsum board.</p>	38 est.	<p>WHI 495-0743</p>

CAUTION: For important fire, safety and use information, go to page 7.

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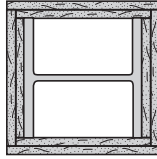
Column Fire-Resistant Assemblies

ToughRock® gypsum board provides a fast, efficient and economical method of protecting steel columns. Fire-resistant assemblies with two-, three- and four-hour ratings are obtainable for heavyweight columns, and a four-hour rating for lightweight columns, depending upon the number of layers of 5/8" (15.9 mm) ToughRock® Fireguard® or 1/2" (12.7 mm) ToughRock® Fireguard C™ gypsum board used. These layers are held in place by a combination of screws and steel studs.

- **Fire Resistant** – For three-hour fire rating, two layers of 1/2" (12.7 mm) ToughRock Fireguard C gypsum board can be used. Design No. X513 3-hour. Two-hour fire rating can be obtained using one layer of 1/2" (12.7 mm) ToughRock Fireguard C gypsum board. Design No. X520 2-hour. These are for heavyweight columns (14 WF 228).
- **Lighter** – Compared to other types of column fire-resistant assemblies, a dead-load savings from 50% to 75% can be realized with ToughRock gypsum board.
- **Faster to Erect** – ToughRock gypsum board can be installed quickly and easily when used for column fire proofing following Georgia-Pacific Gypsum details. Minimum amount of wire and adhesives are used.

1-Hour Fire Rating

Test Reference: NBS 303

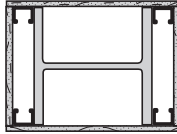


Base Layer: 1/2" (12.7 mm) ToughRock® gypsum board tied to W10 x 49 column 1 hr. with 18-gauge (43 mils) wire 15" (381 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock gypsum board applied with laminating compound over entire contact surface.

2-Hour Fire Rating

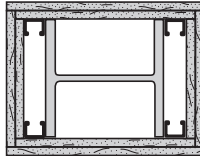
Test Reference: UL X520, GA CM 2110, cUL X520



1/2" (12.7 mm) ToughRock® Fireguard C™ or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board attached to 1-5/8" (41 mm) steel studs with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Studs located at each corner of heavy steel W14 x 288 column. 1-1/4" (32 mm) steel corner bead crimp-attached at 6" (152 mm) intervals.

2-Hour Fire Rating

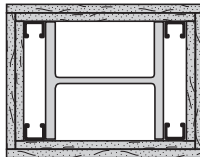
Test Reference: UL X517, ULC Z503



Two layers of 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board screw-attached to 1-5/8" (41 mm) steel studs located at each corner of W10 x 49 column with 1" (25 mm) Type S screws 24" (610 mm) o.c. for base layer and 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. for face layer. 1-1/4" (32 mm) steel beads at corners attached with 6d coated nails 1-3/4" (45 mm) long, 0.0915" (2 mm) shank, 1/4" (6 mm) heads, 12" (305 mm) o.c.

3-Hour Fire Rating

Test Reference: UL X513, GA CM 3130, cUL X513



Two layers of 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C.

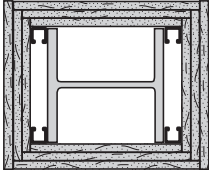
Base Layer: Screw-attached to 1-5/8" (41 mm) steel studs located at corners of heavy steel W14 x 228 column with 1" (25 mm) Type S screws 24" (610 mm) o.c.

Face Layer: Attached with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. into studs. 1" (25 mm) corner bead applied each corner with 1-3/8" (35 mm) 4d coated nails 12" (305 mm) o.c.

Column Fire-Resistant Assemblies *continued*

3-Hour Fire Rating

Test Reference: UL X509, ULC Z502



Three layers of 5/8" (15.9 mm) ToughRock® Fireguard C™ gypsum board, screw-attached to 1-5/8" (41 mm) steel studs located at each corner of W10 x 49 column.

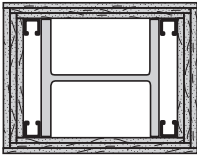
Base Layer: Attached with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Second Layer: Attached with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. and 18-gauge (43 mils) wire tied 24" (610 mm) o.c.

Face Layer: Attached with 2-1/4" (57 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/4" (32 mm) corner bead at each corner nailed with 1-7/8" (48 mm) 6d coated nails 12" (305 mm) o.c.

3-Hour Fire Rating

Test Reference: UL X528, cUL X528



Three layers of 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus® Fireguard C™ gypsum board, screw-attached to 1-5/8" (41.3 mm) steel studs located at each corner of W10 x 49 column.

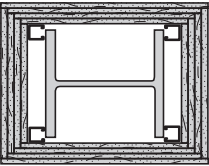
Base Layer: Attached with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Second Layer: Attached with 1-5/8" (41 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: Attached with 2-1/4" (57 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/4" (32 mm) corner bead at each corner nailed with 4d coated nails. Joint compound 1/16" (1.6 mm) thick applied over corner bead and entire outer layer of drywall.

4-Hour Fire Rating

Test Reference: UL X501, cUL X501



Four layers of 5/8" (15.9 mm) ToughRock Fireguard C gypsum board covering W10 x 49 steel column.

Inner Layer: Attached to steel studs with 1" (25 mm) long self-drilling, self-tapping screws spaced vertically 24" (610 mm) o.c.

Second Layer: Attached to steel studs with 1-5/8" (41 mm) long self-drilling, self-tapping screws spaced vertically 24" (610 mm) o.c.

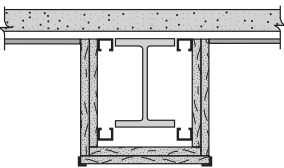
Third Layer: Attached to sheet-metal angles with 1" (25 mm) long, self-drilling, self-tapping screws spaced vertically 12" (305 mm) o.c.

Outer Layer: Gypsum board attached to the sheet metal angles with 1-5/8" (41 mm) long self-drilling, self-tapping screws spaced vertically 12" (305 mm) o.c.

Beam Fire-Resistant Assemblies

2-Hour Fire Rating

Test Reference: UL, N502, ULC O502, GA BM 2130



Two layers of 5/8" (15.9 mm) ToughRock® Fireguard® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board around beam.

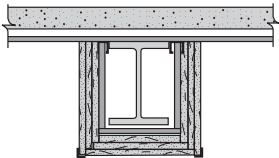
Base Layer: Attached with 1-1/4" (32 mm) Type S drywall screws 16" (406 mm) o.c.

Face Layer: Attached with 1-3/4" (45 mm) Type S drywall screws 8" (203 mm) o.c. to horizontally installed U-shaped steel channels (25-gauge steel (18 mils) 11-1/16" (281 mm) wide with 1" (25 mm) legs) located not less than 1/2" (12.7 mm) from beam flanges. Upper channels secured to steel deck units with 1/2" (12.7 mm) Type S pan-head screws spaced 12" (305 mm) o.c. U-shaped brackets formed of steel channels spaced 24" (610 mm) o.c. suspended from the upper channels with 1/2" (12.7 mm) Type S pan-head screws and supported steel channels installed at lower corners of brackets. Outside corners of gypsum board protected by 0.020" (.5 mm) thick steel corner beads crimped or nailed. (Two-hour restrained or unrestrained beam.)

3-Hour Fire Rating Restrained Beam

2-Hour Fire Rating Unrestrained Beam

Test Reference: UL N505



Three layers of 5/8" (15.9 mm) ToughRock Fireguard or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board around minimum W 8 x 24 beam.

Base Layer: Attached with 1" (25 mm) Type S drywall screws 16" (406 mm) o.c.

Middle Layer: Attached with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c.

Face Layer: Attached with 2-1/4" (57 mm) Type S drywall screws 5/8" (15.9 mm) o.c. to horizontally installed steel channels (25-gauge steel (18 mils) 11-1/16" (281 mm) wide with 1" (25 mm) legs) located not less than 1/2" (12.7 mm) from beam flanges. Upper channels secured to steel deck units with 1/2" (12.7 mm) Type S pan-head screws spaced 12" (305 mm) o.c. Brackets formed of steel channels spaced 24" (610 mm) o.c. suspended from the upper channels with 1/2" (12.7 mm) Type S pan-head screws and supported steel channels installed at lower corners of brackets. 20-gauge hexagonal steel mesh fitted between middle and face layers of gypsum board along bottom and extending 1-1/2" (38 mm) onto sides. Outside corners of gypsum board protected by steel corner beads crimped or nailed to the gypsum board. 1-1/2" (38 mm) fluted steel deck units welded to top of beam and supporting minimum 2-1/2" (64 mm) concrete. (Three-hour restrained or two-hour unrestrained beam.)

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Abbreviations

ACI	Acoustical Consultants Inc.
CK	Cedar Knolls Acoustical Laboratories (Noise Unlimited, Inc.)
cUL	Underwriters Laboratories Inc. (Canadian Listed)
DRC	Domtar Research Centre
FM	Factory Mutual Research Corporation
GA	Gypsum Association
G&H	Geiger and Hamme
IIC	Impact Insulation Class
KAL	Kodaras Acoustical Laboratories
NBS	National Bureau of Standards
NGC	NGC Testing Services
NRCC	National Research Council of Canada
OR	Ohio Research Corporation
OSU	Ohio State University
PCA	Portland Cement Association
RAL	Riverbank Acoustical Laboratories
STC	Sound Transmission Class
SWRI	Southwest Research Institute
UC	University of California
UL	Underwriters Laboratories Inc.
ULC	Underwriters' Laboratories of Canada
WEAL	Western Electro Acoustical Laboratory, Inc.
WHI	Warnock Hersey International (ITS)

Georgia-Pacific UL Type Designations

The Fire Resistance Directory published by Underwriters Laboratories Inc. (UL) cites gypsum panel products classified for fire resistance under category “Gypsum Board (CKNX).” Each UL design lists specific manufacturers and products approved for use in the assembly. Products are identified as designated Types that correlate to specific board formulations. The UL Type designation appears on the UL label and on the product. Gypsum board end tapes and product literature generally contain product names or trademarks, not UL Type designations. The following table provides a quick and easy reference to identify current Georgia-Pacific Gypsum products and their designations in the UL Directory.

UL Type Designation	Product Name
Type 5	1/2" (12.7 mm) ToughRock® Fireguard C™ Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C™ Gypsum Board
Type 6	5/8" (15.9 mm) ToughRock® Fireguard® Moisture-Guard® Gypsum Board 5/8" (15.9 mm) ToughRock® Mold-Guard™ Gypsum Board
Type 9	5/8" (15.9 mm) ToughRock® Fireguard® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard® Soffit Board 5/8" (15.9 mm) ToughRock® Fireguard® Veneer Plaster Base 5/8" (15.9 mm) ToughRock® Fireguard® Abuse-Resistant Gypsum Board
Type DGG	5/8" (15.9 mm) DensGlass® Fireguard® Sheathing
Type DD	5/8" (15.9 mm) DensDeck® Fireguard® Roof Board
Type DS	5/8" (15.9 mm) DensShield® Fireguard® Tile Backer
Type DAP	5/8" (15.9 mm) DensArmor Plus® Fireguard® High-Performance Interior Panel 5/8" (15.9 mm) DensArmor Plus® Fireguard® Abuse-Resistant Interior Panel 5/8" (15.9 mm) DensArmor Plus® Fireguard® Impact-Resistant Interior Panel
Type DGUSL	1" (25.4 mm) DensGlass® Shaftliner Panel

The Dens™ Brand of High-Performance Gypsum Products from Georgia-Pacific

DensGlass® Sheathing	The original and universal standard of exterior gypsum sheathing offers superior weather resistance, with a 12-month weather exposure limited warranty. Look for the familiar GOLD color.
DensShield® Tile Backer	Acrylic-coated tile backer stops moisture at the surface. Lightweight and strong, built for speed on the job site. IBC/IRC Code Compliant. GREENGUARD listed for microbial resistance.
DensDeck® Roof Boards	Fiberglass mat roof board used as the ideal thermal barrier and cover board to improve resistance to wind uplift, hail, foot traffic, fire, moisture and mold in a broad range of commercial roofing applications. Look for green DensDeck Prime and DensDeck DuraGuard, too.
DensGlass® Shaftliner	Specially-designed panels for moisture-prone vertical or horizontal shafts, interior stairwells and area separation wall assemblies. 12-month weather exposure limited warranty. GREENGUARD listed for microbial resistance.
DensArmor Plus® High-Performance Interior Panel	High-performance interior panel accelerates scheduling because it can be installed before the building is dried-in. 12-month weather exposure limited warranty. GREENGUARD Indoor Air Quality Certified,® GREENGUARD Children & Schools™ Certified and CHPS™ listed for low emissions. GREENGUARD listed for microbial resistance.
DensArmor Plus® Abuse-Resistant Interior Panel	Same benefits as DensArmor Plus® High-Performance Interior Panel with added resistance to scuffs, abrasions and surface indentations. Ideal for healthcare facilities and schools. GREENGUARD Indoor Air Quality Certified,® GREENGUARD Children & Schools™ Certified and CHPS™ listed for low emissions. GREENGUARD listed for microbial resistance.
DensArmor Plus® Impact-Resistant Interior Panel	Even greater durability with an embedded impact-resistant mesh for the ultimate resistance in high traffic areas. Ideal for healthcare facilities, schools and correctional institutions. GREENGUARD Indoor Air Quality Certified,® GREENGUARD Children & Schools™ Certified and CHPS™ listed for low emissions. GREENGUARD listed for microbial resistance.



Georgia-Pacific Gypsum

U.S.A. Georgia-Pacific Gypsum LLC
CANADA Georgia-Pacific Canada, ULC

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TECHNICAL HOTLINE U.S.A. and Canada: **1-800-225-6119**



Some of our products have been certified by Scientific Certification Systems (SCS). SCS is an internationally recognized third-party evaluation, testing and certification organization. Its program spans a wide cross-section of the economy, including manufacturing and retailing, consumer products, the energy industry, and the home improvement and construction sectors. For details on specific Georgia-Pacific Gypsum products and plants, please contact our Technical Hotline at 1-800-225-6119.

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WARRANTIES, REMEDIES AND TERMS OF SALE –

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UPDATES AND CURRENT INFORMATION –

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