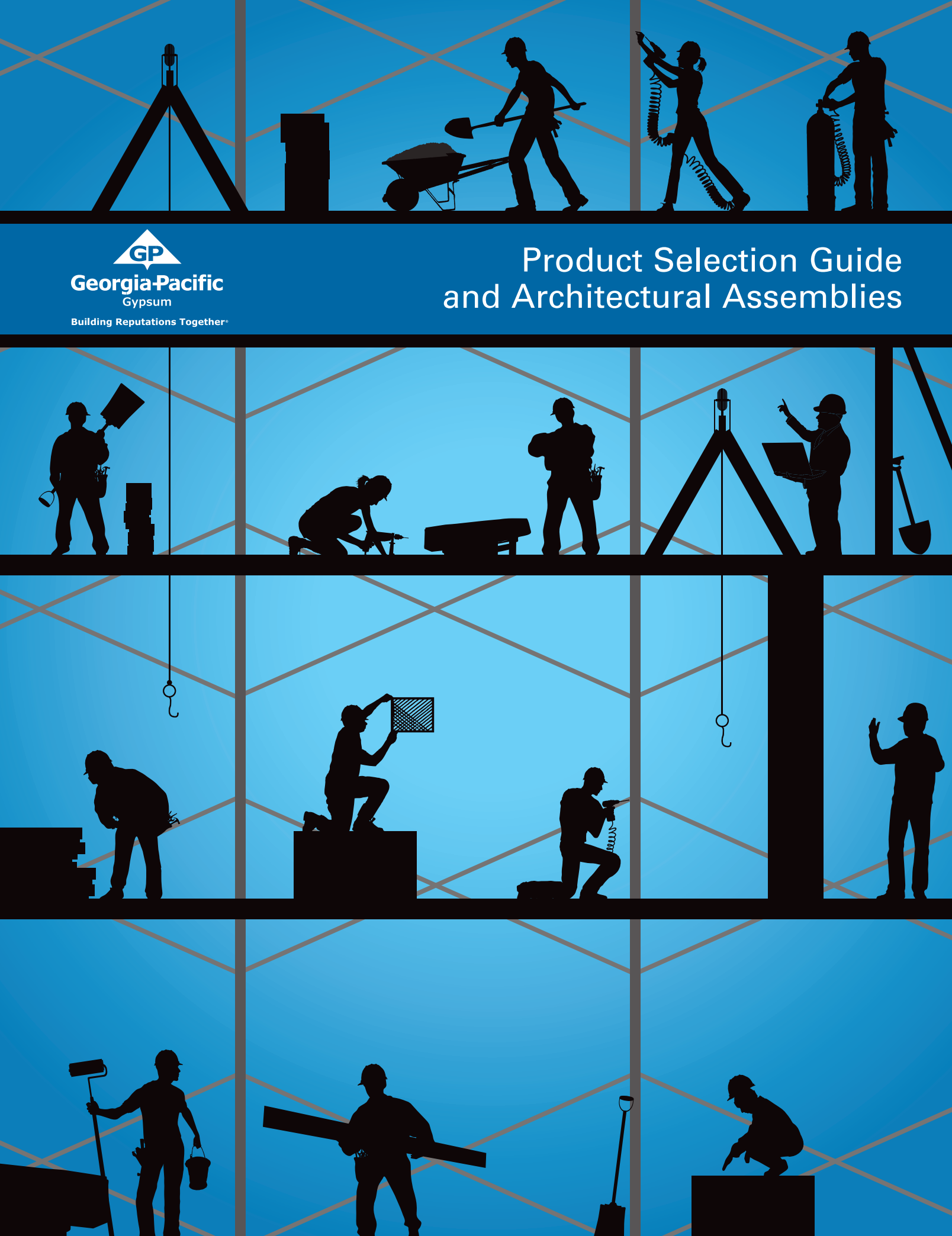

Georgia-Pacific Gypsum

Building Reputations Together®

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 have been tested to conform to the following standards:

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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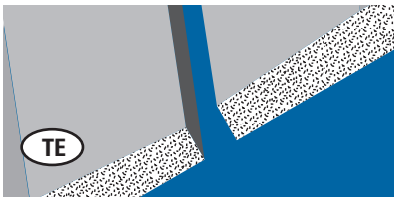
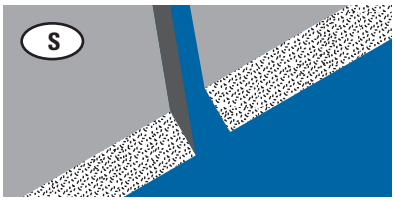
Gypsum Board Edge Details



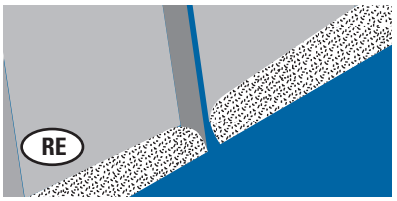
Tapered

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" (51 mm).



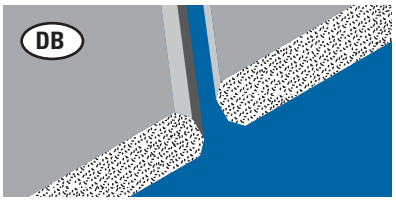
Square

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.



Tapered with Round Edge

Round edge is designed to reduce the beading and ridging problems commonly associated with standard-type gypsum 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.

ToughRock® Gypsum Board

The federal and CSA standards, as well as certain ASTM standards, listed have been withdrawn or replaced and are provided for information only.

Product	Dimensions			Edge					Standard		
	TH	W	L	TE	S	RE	B	DB	ASTM	FEDERAL	CSA
ToughRock® Lite-Weight Gypsum Board – Lighter weight than traditional 1/2" drywall. For use on interior walls and ceilings up to 24" on center, sag resistant.	1/2" (12.7 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4877 mm)	•					C 1396 (Secs. 5 & 12) C 36	SS-L-30d Type III Grade R	A82.27 M
ToughRock® Gypsum Wallboard – For interior walls and ceilings. Accommodates wide range of decorative treatments.	1/4" (6.4 mm) 3/8" (9.5 mm) 1/2" (12.7 mm)	4' (1219 mm) 4' (1219 mm) 4' (1219 mm)	8' to 12' (2438 mm to 3658 mm) 8' to 12' (2438 mm to 3658 mm) 8' to 16' (2438 mm to 4877 mm)	• • •	• •	 •			C 1396 (Sec 5) C 36	SS-L-30d Type III Grade R	A82.27 M
ToughRock® Fireguard X™ 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 4877 mm)	•	•	•	•		C 1396 (Sec 5) 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) 5/8" (15.9 mm)	4' (1219 mm) 4' (1219 mm)	8' to 12' (2438 mm to 3658 mm) 8' to 12' (2438 mm to 4876 mm)	• •	• 	• •	• •		C 1396 (Sec 5) C 36	SS-L-30d Type III Grade R	A82.27 M
ToughRock® Mold-Guard™ (Mold-Resistant) – For interior walls and ceilings. 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 (Sec 7) C 630	SS-L-30d Type VII Grade W	A82.27 M
ToughRock® Fireguard X™ 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 (Sec 7) 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® Stretch 54® Gypsum Board – For interior walls and ceilings. Accommodates wide range of decorative treatments. Eliminates filler strip.	1/2" (12.7 mm) 5/8" (15.9 mm)	54" (1371 mm) 54" (1371 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1396 (Sec 5) C 36	SS-L-30d Type III Grade R	A82.27 M
ToughRock® Span 24® 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 (Sec 12) C 1395	SS-L-30d Type III Grade R	
ToughRock® Fireguard C® Soffit Board – Soffit board with treated paper face bonded to specially formulated core designed to resist sag. For exterior use such as outdoor building soffits, carports and outdoor applications where there is no direct exposure to weather.	5/8" (15.9 mm)	4' (1219 mm)	8', 9', 10' (2438 mm to 3048 mm)	•					C 1396 (Sec 8) C 931		A82.27 M
ToughRock® Fireguard X™ Abuse-Resistant 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 (Sec 5) C 36	SS-L-30d Type III Grade X	A82.27 M

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.

Dens® Brand Fiberglass Mat Gypsum Panels

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

Product	Dimensions			Edge					Standard
	TH	W	L	TE	S	RE	B	DB	ASTM
The DensArmor Plus® family of gypsum panels are certified by UL Environment as GREENGUARD Low Chemical Emissions and GREENGUARD Gold.									
DensArmor Plus® Interior Panels – 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.	1/2" (12.7 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, C 1177, C 1396 (moisture resistance) and C 630
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.	5/8" (15.9 mm)	4' (1219 mm)	8' to 12' (2438 mm to 3658 mm)	•					C 1658, C 1177, C 1396 (moisture resistance) and C 630
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.	1/2" (12.7 mm) 5/8" (15.9 mm)	4' (1219 mm) 4' (1219 mm)	8' to 12' (2438 mm to 3658 mm) 8' to 12' (2438 mm to 3658 mm)	• •					C 1658, C 1177, C 1396 (moisture resistance) and C 630
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 and ULC Classified.	5/8" (15.9 mm)	4' (1219 mm)	8' to 10' (2438 mm to 3048 mm)	•					C 1658, C 1177, C 1396 (moisture resistance), C 630 Test Standard C 1629
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 and ULC Classified.	5/8" (15.9 mm)	4' (1219 mm)	8' to 10' (2438 mm to 3048 mm)	•					C 1658, C 1177, C 1396 (moisture resistance), C 630 Test Standard C 1629
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 and lighter than cement board.	1/4" (6.4 mm) 1/2" (12.7 mm) 1/2" (12.7 mm) 1/2" (12.7 mm)	4' (1219 mm) 32" (813 mm) 4' (1219 mm) 4' (1219 mm)	4' (1219 mm) 5' (1524 mm) 5' (1524 mm) 8' (2438 mm)		• • • •				C 1178
DensShield® Fireguard® Tile Backer – Use as described above. Noncombustible core. Can be used in select fire-rated assemblies. UL and ULC Classified.	5/8" (15.9 mm)	4' (1219 mm)	8' (2438 mm)		•				C 1178
DensDeck® Roof Board – Superior, nonstructural thermal barrier roof board for commercial roof and re-roof applications. Fiberglass mat facings with treated core.	1/4" (6.4 mm) 1/2" (12.7 mm) 1/2" (12.7 mm)	4' (1219 mm) 4' (1219 mm) 4' (1219 mm)	8' (2438 mm) 4' (1219 mm) 8' (2438 mm)		• • •				C 1177
DensDeck® Prime Roof Board – Premium, non-structural roof board engineered with a non asphaltic coating to enhance bonding in commercial roofing systems. Fiberglass mat facings with treated core.	1/4" (6.4 mm) 1/4" (6.4 mm) 1/2" (12.7 mm) 1/2" (12.7 mm)	4' (1219 mm) 4' (1219 mm) 4' (1219 mm) 4' (1219 mm)	4' (1219 mm) 8' (2438 mm) 4' (1219 mm) 8' (2438 mm)		• • • •				C 1177

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

Dens Brand Fiberglass Mat Gypsum Panels
continued next page

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

Dens® Brand Fiberglass Mat Gypsum Panels continued

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

Product	Dimensions			Edge					Standard
	TH	W	L	TE	S	RE	B	DB	ASTM
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.	1/4" (6.4 mm) 1/4" (6.4 mm) 1/2" (12.7 mm) 1/2" (12.7 mm)	4' (1219 mm) 4' (1219 mm) 4' (1219 mm) 4' (1219 mm)	4' (1219 mm) 8' (2438 mm) 4' (1219 mm) 8' (2438 mm)		• • • •				C 1177
DensDeck®, DensDeck® Prime and DensDeck® DuraGuard Fireguard® Roof Board – Use as described on previous page. Type X gypsum board. UL and ULC Classified. 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 generic Type X fire-rated wall assemblies. Qualifies for numerous 1- and 2-hour fire-rated assemblies. UL and 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. Moisture-resistant, treated, Type X core. Beveled edges facilitate fit into metal components. UL and ULC Classified.	1" (25.4 mm)	23-7/8" (606 mm)	8' to 12' (2438 mm to 3658 mm)					•	C 1658, C 1396 (Sec 6) and C 442

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

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 veneer plasters.	1/2" (12.7 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)	•					C 1396 (Sec 10) C 588	SS-L-30d Type VI Grade R	A82.27 M
ToughRock® Fireguard X™ Veneer Plaster Base – Use as described above. Same UL Classification as ToughRock® Fireguard X™ Gypsum Board.	5/8" (15.9 mm)	4' (1219 mm)	8' to 16' (2438 mm to 4876 mm)	•					C 1396 (Sec 10) C 588	SS-L-30d Type VI Grade X	A82.27 M

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

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.buildgp.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 UL 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 UL'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 board and ASTM C 1658 for glass mat gypsum panel products) for further information and significance of use.

Generic systems in the GA-600 Fire Resistance Design Manual are applicable to the products of any manufacturer, including Georgia-Pacific Gypsum, provided they meet certain standards set forth in such manual, such as Type X gypsum board per applicable ASTM standard with specified thickness and size described in the design.

"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.

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

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.

Delivery, Handling and Storage

All materials shall be delivered in original bundles bearing the brand name, if any; applicable standard designation; and name of the manufacturer or supplier for whom the product is manufactured. The plastic packaging used to wrap gypsum panel products for rail and/or truck shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery. Such plastic packaging shall be removed immediately upon receipt of the shipment. **WARNING:** Failure to remove protective plastic shipping covers can result in condensation which can lead to damage, including mold.

All materials should be kept dry. Gypsum panel products shall be neatly stacked flat with care taken to prevent sagging or damage to edges, ends and surfaces. Gypsum panel products and accessories shall be properly supported on risers on a level platform, and fully protected from weather, direct sunlight exposure, and condensation. Gypsum panel products shall be stacked flat rather than on edge or end. **WARNING:** Gypsum panel products stacked on edge or end can be unstable and present a serious hazard in the workplace should they accidentally topple.

Refer to Handling *Gypsum Panel Products*, GA-801, for proper storage and handling requirements.

Reference: Application and Finishing of Gypsum Panel Products, GA-216, Gypsum Association.

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.

For Material Safety Data Sheets or additional product fire, safety and use information go to www.buildgp.com/safetyinfo or call 404-652-5119.

Fire- and Sound-Rated Assemblies

The following design assemblies are presented for illustrative purposes only. It is important that you consult a design professional and the appropriate fire resistance directory or test report for complete assembly information and related information. Georgia-Pacific Gypsum does not provide architectural or engineering services. For additional fire safety information concerning Georgia-Pacific Gypsum's products, go to page 7 and visit www.buildgp.com/safetyinfo.

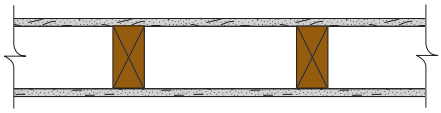
Some of the Georgia-Pacific Gypsum products identified in the following design assemblies have been classified by UL and/or ULC and included in assembly designs investigated by UL and ULC for hourly fire resistance ratings. For additional information on the classification of such products by UL and ULC, go to page 35. Other Georgia-Pacific Gypsum products identified below have been included in generic assemblies on the basis of satisfying Type X requirements in accordance with applicable ASTM standards. For additional information on generic assemblies and Type X requirements, go to page 7.

Proprietary GA-600 Designs: Assemblies listed as proprietary in the GA-600 Fire Resistance Design Manual only list one product per manufacturer and may not include all products referenced in the illustrations above. Please consult the specified UL, ULC, cUL or other fire listing or test for a complete list of approved products.

Wood-Framed Wall Assemblies

45-Min. Fire Rating

Design Reference: UL U317, cUL U317

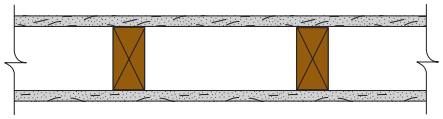


Partition Thickness: 4-5/8" (118 mm)
Weight per Sq. Ft.: 6.0 (29 Kg/m^2)

1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® gypsum board applied vertically or horizontally 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.

1-Hour Fire Rating

Design Reference: UL U305, ULC W301, cUL U305, GA WP 3605



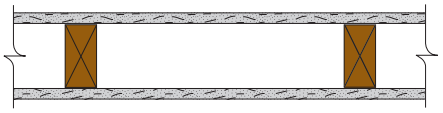
30-34 STC Sound Trans.

Test Reference: OR 64-8
Partition Thickness: 4-7/8" (124 mm)
Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically or horizontally 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. W301 allows vertical application only.

1-Hour Fire Rating

Design Reference: GA WP 3520



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/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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.

1-Hour Fire Rating

Design Reference: UL U338, cUL U338, GA WP 3640

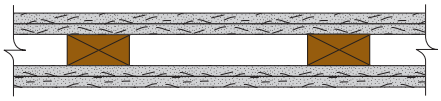
Partition Thickness: 2-7/8" (73 mm)
Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally 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).

Wood-Framed Wall Assemblies continued

1-Hour Fire Rating

Design Reference: UL U338, cUL U338, GA WP 3641



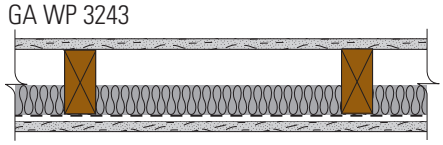
Partition Thickness: 4-1/2" (114 mm)
Weight per Sq. Ft.: 12.0 (59 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® applied vertically or horizontally 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.

Face Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard applied vertically or horizontally to each side with 8d cement coated nails, 2-3/8" (60 mm) long 8" (203 mm) o.c.

1-Hour Fire Rating

Design Reference: UL U309, cUL U309, GA WP 3243



50-54 STC Sound Trans.

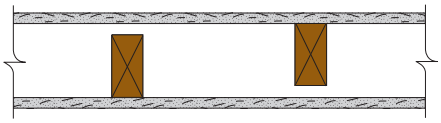
Test Reference: RAL TL77-138
Partition Thickness: 5-1/4" (133 mm)
Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

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

Resilient channels 24" o.c. attached horizontally on one side of 2" x 4" wood studs 24" o.c. with 1-1/4" Type S drywall screws. One layer 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® interior panels applied horizontally to channels with 1" Type S drywall screws 8" o.c. with vertical joints located mid way between studs. 3" mineral or glass fiber insulation in stud space. Opposite side: one layer 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied horizontally or vertically to studs with 6d cement coated nails, 1 7/8" long, 0.0915" shank, 15/64" heads, 7" o.c. Vertical joints staggered 24" on opposite sides.

1-Hour Fire Rating

Design Reference: UL U305, ULC W301, cUL U305, GA WP 5515



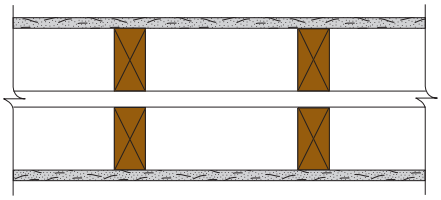
40-44 STC Sound Trans.

Test Reference: NRCC TL-93-254, IRC-IR-761
Partition Thickness: 7-3/4" (197 mm),
Weight per Sq. Ft.: 8.0 (39 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally 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. W301 allows vertical application only.

1-Hour Fire Rating

Design Reference: UL U305, ULC W301, cUL U305, 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/m^2)

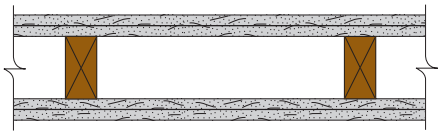
5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally to each side of double row of 2" x 4" wood studs 16" (406 mm) o.c. on separate plates 1" (25 mm) apart with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c. Wallboard nailed to top and bottom plates 7" (178 mm) o.c. Stagger joints each side. Horizontal bracing required at mid height. W301 allows vertical application only.

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

Wood-Framed Wall Assemblies continued

2-Hour Fire Rating

Design 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/m^2)

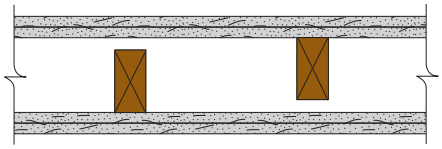
Sound Tested with studs 16" (406 mm) o.c. and with nails for base layer spaced 6" (152 mm) o.c.

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically or horizontally 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally 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.

2-Hour Fire Rating

Design Reference: 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/m^2)

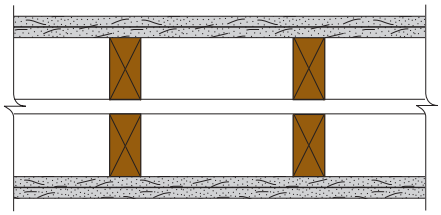
Sound Tested with nails for base layer spaced 6" (152 mm) o.c.

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied horizontally 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied horizontally 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

Design Reference: 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/m^2)

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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied horizontally 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.

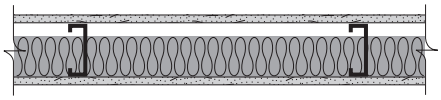
Face Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied horizontally to each side with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c. Stagger vertical joints 16" (406 mm) o.c. each layer and side. Horizontal bracing required at mid height.

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

Steel-Framed Wall Assemblies

1-Hour Fire Rating

Design Reference: ULC W412, GA WP 1070



45-49 STC Sound Trans.

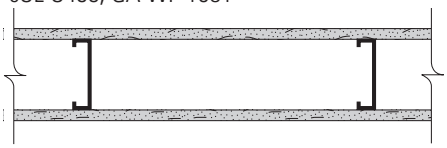
Test Reference: RAL TL69-42
Partition Thickness: 3-1/2" (89 mm)
Weight per Sq. Ft.: 5.0 (24 Kg/m^2)

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

1/2" (12.7 mm) ToughRock® Fireguard C® gypsum board applied vertically 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

Design Reference: UL U465, ULC W415, cUL U465, 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/m^2)

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

5/8" (15.9 mm) ToughRock® Fireguard X™ 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

Design Reference: GA WP 1090

45-49 STC Sound Trans.

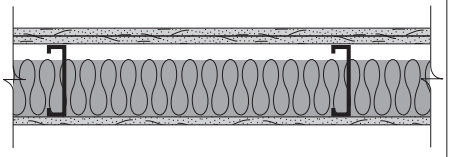
Test Reference: ACI 7-115 2019c
Partition Thickness: 3-1/8" (79 mm)
Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

Base Layer: 1/4" (6.4 mm) ToughRock® gypsum board applied vertically 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 vertically to each side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Stagger joints.

1-Hour Fire Rating

Design 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/m^2)

1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® gypsum board applied horizontally 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 horizontally to studs with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

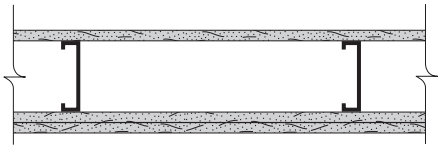
Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied horizontally to framing with 1-5/8" (41 mm) Type S drywall screws 8" (203 mm) o.c. at end joints and 12" (305 mm) o.c. at perimeter and intermediate studs. Stagger vertical joints 24" (610 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/m^3), friction fit in stud space.

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

Steel-Framed Wall Assemblies continued

1-Hour Fire Rating

Design Reference: 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/m^2)

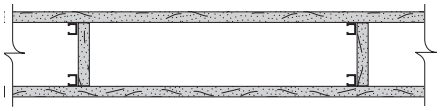
Sound Tested with 3-1/2" (89 mm) fiberglass insulation friction fit in stud space

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically or horizontally 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally to one side with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c.

1-Hour Fire Rating

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



50-54 STC Sound Trans.

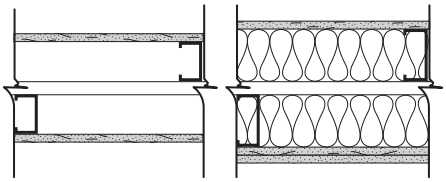
Test Reference: RAL TL76-155
Partition Thickness: 10-3/4" (273 mm)
Weight per Sq. Ft.: 5.5 (27 Kg/m^2)

Sound Tested with 3-1/2" (89 mm) fiberglass insulation, stapled to one side in cavity

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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.

1-Hour Fire Rating

Design Reference: UL V490, ULC W483, cUL V490, GA WP 5000



63 STC Sound Trans.

Test Reference: RAL TL 09-333
Partition Thickness: 7-1/4" (184 mm)
Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

5/8" (15.9 mm) DensArmor Plus® Fireguard® interior panels applied to one side of a double row of 2-1/2" (64 mm) 25-gauge (18 mils) 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. when applied horizontally to studs and 8" (203 mm) at vertical and bottom edges and 12" (305 mm) o.c. at intermediate studs when applied vertically to studs.

5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied vertically or horizontally to studs with 1" (25 mm) Type S drywall screws 8" (203 mm) o.c. when applied horizontally to studs and 8" (203 mm) at vertical and bottom edges and 12" (305 mm) o.c. at intermediate studs when applied vertically to studs.

Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Horizontal joints need not be backed by framing. Horizontal joints on opposite sides need not be staggered. Lateral bracing on both sides of the wall not less than 5 feet on center vertically.

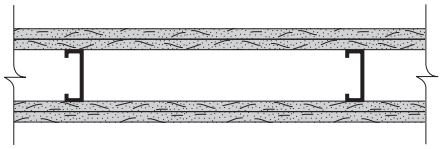
Sound tested with a second layer of 5/8" (15.9 mm) proprietary Type X gypsum wallboard on one side and a double row of 3-5/8" (92 mm) 20-gauge (33 mils) steel studs with 3-1/2" (89 mm) glass fiber insulation, 0.5 pcf, on both sides in cavity. (NLB)

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

Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

Design Reference: UL V487, cUL V487



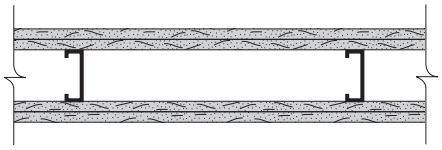
Partition Thickness: 4-1/8" (105 mm)
Weight per Sq. Ft: 10.0 (49 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ 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 24" (610 mm) o.c.

Face Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ 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" (305 mm)

2-Hour Fire Rating

Design Reference: UL U411, cUL U411



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/m^2)

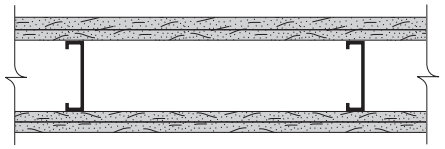
Sound Tested with 2-1/2" (64 mm) fiberglass insulation

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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.

2-Hour Fire Rating

Design Reference: UL U411, cUL U411, GA WP 1522



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/m^2)

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 X™ 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 screws 16" (406 mm) o.c.

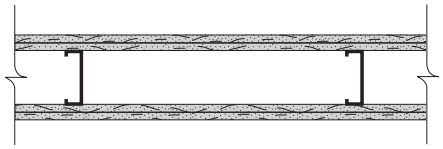
Face Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically to each side with drywall adhesive or secured with 1-5/8" (41 mm) Type S screws 12" (305 mm) o.c. at top and bottom track, 16" (406 mm) o.c. at edge joints and intermediate framing. Stagger joints 24" (610 mm) each layer and side.

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

Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

Design Reference: UL U412, cUL U412



45-49 STC Sound Trans.

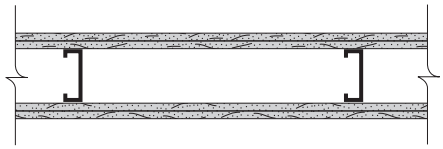
Test Reference: NGC 2250
Partition Thickness: 4-1/2" (114 mm)
Weight per Sq. Ft.: 9.0 (44 Kg/m^2)

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® gypsum board applied vertically 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 vertically 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

Design 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/m^2)

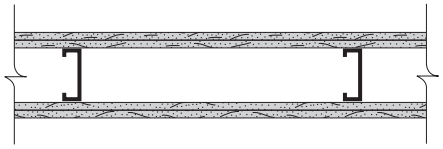
Sound Tested with 2-1/2" (64 mm) fiberglass insulation stapled in stud space

Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied vertically 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 vertically 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

Design Reference: ULC W414, GA WP 1521



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/m^2)

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

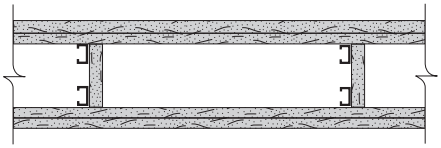
Base Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied vertically to each side of 3-5/8" (92 mm) steel studs 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied vertically 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.

Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

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



55-59 STC Sound Trans.

Test Reference: RAL TL76-156
Partition Thickness: 12" (305 mm)

Weight per Sq. Ft.: 10.0 (49 Kg/m^2)

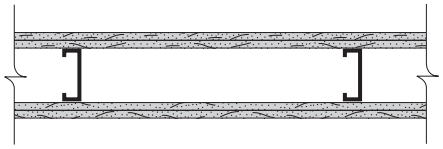
Sound Tested with 3-1/2" (89 mm) fiberglass insulation stapled in stud space

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® applied vertically 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard applied vertically 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

Design Reference UL U425, cUL U425,
GA WP 1716



40-44 STC Sound Trans

Test Reference: NGC 2250
Partition Thickness: 6" (152 mm)
Weight per Sq. Ft: 10 (49 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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.

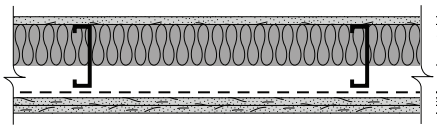
Bracing: Lateral bracing spaced not over 40" (1,016 mm) o.c. shall be 1" (25 mm) by 18-gauge (43 mils) steel straps attached to each side or channel bracing attached to each stud with a clip angle. For studs with holes or punch-outs in the web the "Q" factor shall be determined by means of stub column tests. Tested at 80 percent of design load. (LIMITED LOAD-BEARING)

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

Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

Design Reference: UL U453, cUL U453, GA WP 1520



55-59 STC Sound Trans.

Test Reference: RAL TL83-215
Partition Thickness: 5-1/2" (140 mm)
Weight per Sq. Ft.: 9.0 (44 Kg/m^2)

25-gauge (18 mils) resilient channels 24" (610 mm) o.c. attached horizontally 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.

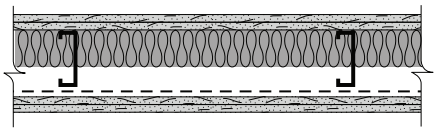
Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® gypsum board applied horizontally to channels with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied horizontally 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 vertically 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.

2-Hour Fire Rating

Design Reference: UL U454, GA WP 1470



55-59 STC Sound Trans.

Test Reference: RAL TL83-214
Partition Thickness: 6" (152 mm)
Weight per Sq. Ft.: 12.0 (59 Kg/m^2)

Resilient channels 24" (610 mm) o.c. attached horizontally 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 gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C interior panels applied horizontally 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 gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C interior panels applied horizontally 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/m^3), friction fit in stud space.

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

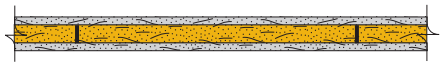
Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board applied vertically to studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Joints staggered.

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

Steel-Framed Wall Assemblies continued

2-Hour Fire Rating

Design Reference: OSU T-1339*



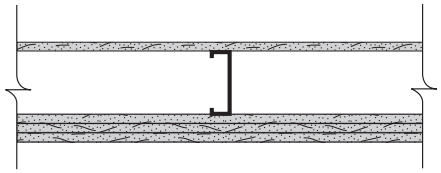
35-39 STC Sound Trans.

Test Reference: NGC 2359
Partition Thickness: 2" (51 mm)
Weight per Sq. Ft.: 9.0 (44 Kg/m^2)

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

2-Hour Fire Rating

Design Reference: UL U421, ULC W477, cUL U421, GA WP 1555



55 STC Sound Trans

Test Reference: RAL TL 10-196
Partition Thickness: 6" (152 mm)
Weight per Sq. Ft.: 8.5 (41 Kg/m2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® interior panels applied vertically or horizontally to one side of 2-1/2" (64 mm), 25-gauge (18 mils) steel studs 24" (610 mm) o.c. with 1" (25.4 mm) Type S drywall screws 8" (203 mm) o.c. at vertical joints and 12" (305 mm) o.c. at intermediate studs when applied vertically to framing, or 8" (203 mm) o.c. when applied horizontally to framing.

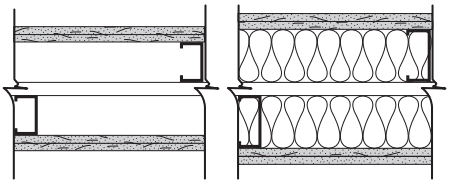
Opposite side: Base layer – 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied vertically or horizontally to studs with 1" (25.4 mm) Type S drywall screws 8" (203 mm) o.c. at vertical joints and 12" (305 mm) o.c. at intermediate studs when applied vertically to framing, or 8" (203 mm) o.c. when applied horizontally to framing. Second layer – 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied vertically or horizontally to studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Face layer – 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied vertically or horizontally to studs with 2-3/8" (60 mm) Type S drywall screws 8" (203 mm) o.c. at vertical joints and 12" (305 mm) o.c. at intermediate studs when applied vertically to framing, or 8" (203 mm) o.c. applied horizontally to framing. Horizontal joints staggered not less than 6" (152 mm) between layers. When gypsum panels are other than 48" (1219 mm) wide, panels are applied horizontally to the framing.

Vertical joints staggered 24" (610 mm) each layer and side.

Sound tested with 2-1/2" (64 mm) fiberglass insulation.

2-Hour Fire Rating

Design Reference: UL V490, ULC W483, cUL V490, GA WP 5050



67 STC Sound Trans.

Test Reference: RAL TL 09-332
Partition Thickness: 8-1/2" (216 mm)
Weight per Sq. Ft.: 9.0 (44 Kg/m^2)

Base Layer: 5/8" (15.9 mm) DensArmor Plus® Fireguard® interior panels applied vertically or horizontally to one side of a double row of 2-1/2" (64 mm), 25-gauge steel studs 24" (610 mm) o.c. and not less than 1" (25.4 mm) apart with 1" (25.4 mm) Type S drywall screws 16" (406 mm) o.c.

Face Layer: 5/8" (15.9 mm) DensArmor Plus Fireguard interior panels applied vertically or horizontally to same side of studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c. Face layer vertical joints offset one stud cavity from base layer vertical joints. Face layer horizontal joints offset not less than 6" (152 mm) from base layer horizontal joints.

Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Horizontal joints need not be backed by framing. Horizontal joints on opposite sides need not be staggered. Lateral bracing on both sides of the wall not less than 5 feet on center vertically.

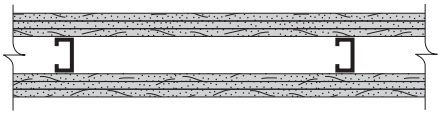
Sound tested using double row 3-5/8" (92 mm) 18-gauge (43 mils) steel studs and 3-1/2" (89 mm) glass fiber insulation, 0.5 pcf, on both sides in cavity. (NLB)

**Test conducted with generic Type X gypsum board in December 1959. Contact GP Technical Service Hotline for a copy of the test report.*

Steel-Framed Wall Assemblies continued

3-Hour Fire Rating

Design Reference: WHI-495-0785 and 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/m^2)

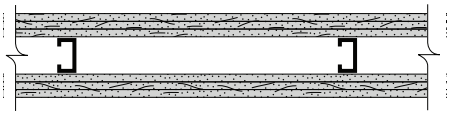
Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C® gypsum board or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® interior panels applied vertically to each side of 1-5/8" (41 mm) metal studs 24" (610 mm) o.c. with joints staggered 24" (610 mm) each side using 1" (25 mm) Type S drywall screws 12" (305 mm)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

Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C interior panels applied vertically 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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C interior panels applied horizontally to each side with 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.

3-Hour Fire Rating

Design Reference: UL U435, cUL 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/m^2)

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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically 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.

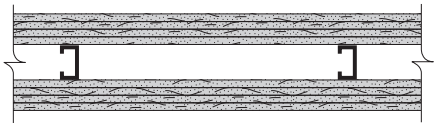
Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically to each side with 1-5/8" (41 mm) Type S drywall screws 24" (610 mm) o.c.

Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically or horizontally 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.

Steel-Framed Wall Assemblies continued

4-Hour Fire Rating

Design Reference: WHI-495-0786 and 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/m^2)

Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C® gypsum board or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® applied vertically 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.

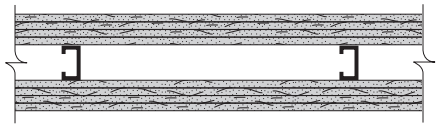
Second Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically to each side with joints staggered 24" (610 mm) each side attached to studs with 1-5/8" (41 mm) Type S drywall screws 12" (305 mm) o.c.

Third Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically 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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C installed horizontally 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

Design Reference: UL U435, cUL 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/m^2)

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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically 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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically 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 or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied vertically 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.

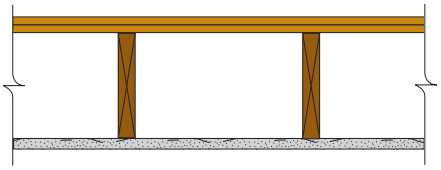
Face Layer: 1/2" (12.7 mm) ToughRock Fireguard C gypsum board or 1/2" (12.7 mm) DensArmor Plus Fireguard C applied horizontally to each side with 2-5/8" (67 mm) Type S drywall screws 12" (305 mm) o.c. and 1-1/2" (38 mm) Type G drywall screws midway between studs 1-1/2" (38 mm) above and below horizontal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

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

Floor/Ceiling Wood-Framed Assemblies

1-Hour Fire Rating

Design Reference: UL L501, ULC M500, cUL L501, GA FC 5420



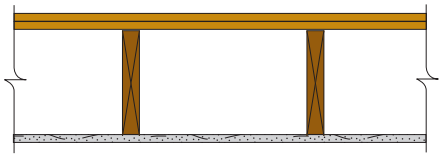
35-39 STC Sound Trans. Test Reference: NGC 4024
IIC 32 Test Reference: NGC 5032

Weight per Sq. Ft.: 2.5 (12 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ applied perpendicular 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

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



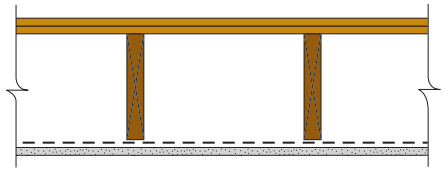
35-39 STC Sound Trans. Test Reference: NGC 4024
IIC 32 Test Reference: NGC 5032
IIC 66 with carpet and pad Test Reference: NGC 5032

Weight per Sq. Ft.: 2.0 (10 Kg/m^2)

1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus® Fireguard C® gypsum board applied perpendicular 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

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



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/m^2)

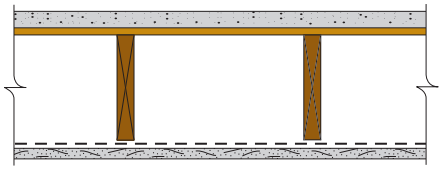
1/2" (12.7 mm) ToughRock® Fireguard C® or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 60" (1524 mm) long with screws 12" (305 mm) o.c. Resilient channels applied perpendicular 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.

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

Floor/Ceiling Wood-Framed Assemblies continued

1-Hour Fire Rating

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



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

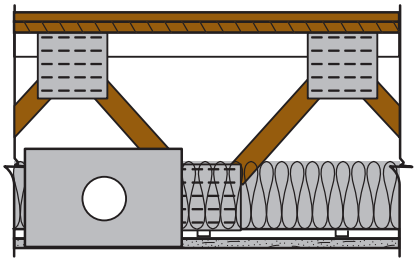
Weight per Sq. Ft.: 2.0 (10 Kg/m^2)

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 perpendicular 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 perpendicular 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.

1-Hour Fire Rating

Design Reference: UL M503, cUL M503, GA FC 5515.3

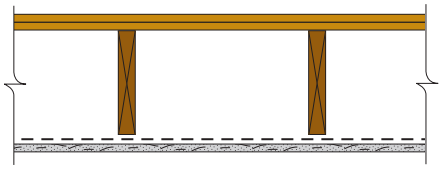


Weight per Sq. Ft.: 3.0 (15 Kg/m^2)

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 and 5/8" (15.9 mm) ToughRock Fireguard C gypsum panels ceiling membrane, screws spaced 1/2" (12.7 mm) and 4" (102 mm) from side joints and 8" (203 mm) o.c. to the rest of the field.

1-Hour Fire Rating

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



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/m^2)

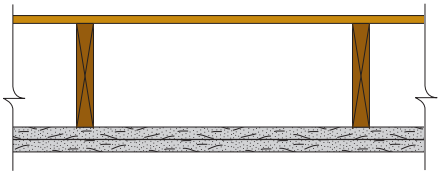
1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular to resilient channels 24" (610 mm) o.c. with 1" (25 mm) Type S drywall screws 12" (305 mm) o.c. Gypsum board end joints located midway between continuous channels and attached to additional pieces of channels 54" (1372 mm) long with screws 12" (305 mm) o.c. Resilient channels applied perpendicular 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.

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

Floor/Ceiling Wood-Framed Assemblies continued

1-Hour Fire Rating

Design Reference: GA FC 5406



35-39 STC Sound Trans.

Test Reference: Est.

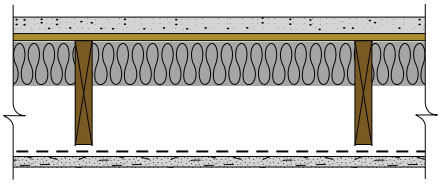
Weight per Sq. Ft.: 5.0 (24 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied perpendicular 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 perpendicular to top of joists with 8d nails. **Ceiling provides one-hour fire resistance protection for framing, including trusses.**

1-Hour Fire Rating

Design Reference: UL L516, cUL L516



50-54 STC Sound Trans.
IIC 74

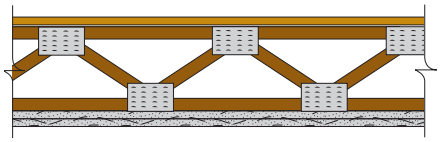
Test Reference: KAL L224 27-65

Weight per Sq. Ft.: 2.5 (12 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" DensArmor Plus® Fireguard C® applied perpendicular 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 perpendicular 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/m^3) in joist space stapled to subfloor.

1-Hour Fire Rating

Design Reference: GA FC 5512



Weight per Sq. Ft.: 4.0 (20 Kg/m^2)

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).

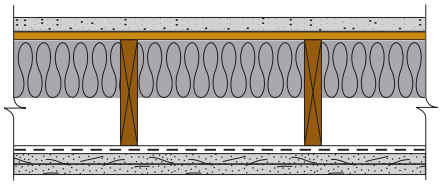
Flooring: 19/32" (15.1 mm) T&G plywood with exterior glue applied at right angles to top of trusses with 6d common nails 6" (152 mm) o.c. Plywood end joints staggered 48" (1219 mm).

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

Floor/Ceiling Wood-Framed Assemblies continued

1-1/2-Hour Fire Rating

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



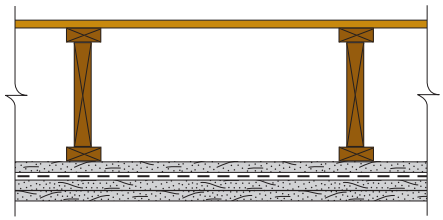
Weight per Sq. Ft.: 5.0 (24 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied perpendicular 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. perpendicular 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied perpendicular 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/m^3), 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

Design Reference: UL L538, cUL L538



Weight per Sq. Ft.: 8.0 (39 Kg/m^2)

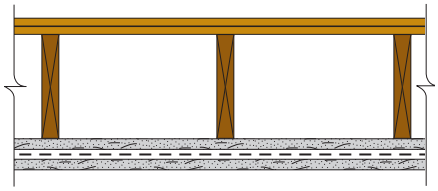
Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" (15.9 mm) DensArmor Plus® Fireguard C® applied perpendicular to I-shaped wood joists or wood and steel trusses, spaced 19.2" (488 mm) o.c. maximum, with 1-5/8" (41 mm) Type S drywall screws, 8" (203 mm) o.c. Resilient channels attached 16" (406 mm) o.c. through base layer perpendicular 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 or 5/8" (15.9 mm) DensArmor Plus Fireguard C applied perpendicular 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 or 5/8" (15.9 mm) DensArmor Plus Fireguard C applied perpendicular 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 perpendicular to joists with adhesives and 8d cement coated nails 12" (305 mm) o.c.

2-Hour Fire Rating

Design Reference: UL L505, ULC M503, cUL U505, GA FC 5724



Weight per Sq. Ft.: 6.0 (29 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard C (UL L505 only) applied perpendicular 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 perpendicular to wood framing through base layer with 2-1/2" (64 mm) long screws. Double channel installed at face layer end joints.

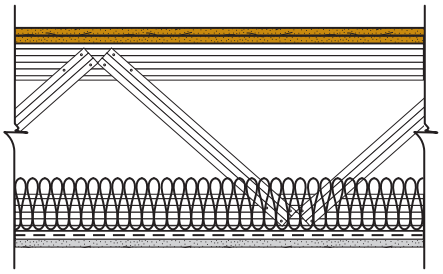
Face Layer: 5/8" (15.9 mm) ToughRock Fireguard C gypsum board applied or 5/8" (15.9 mm) DensArmor Plus Fireguard C (UL L505 only) applied perpendicular to resilient channels with 1" (25 mm) Type S screws 12" (305 mm) o.c. Wood joists supporting 1" (25.4 mm) nominal T&G wood subfloor and 1" (25 mm) nominal wood finish floor or 15/32" (11.9 mm) plywood subfloor and 19/32" (15.1 mm) plywood finish floor applied perpendicular to joists with joints staggered.

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

Floor/Ceiling Steel-Framed Assemblies

1-Hour Fire Rating

Design Reference: UL M507, cUL M507

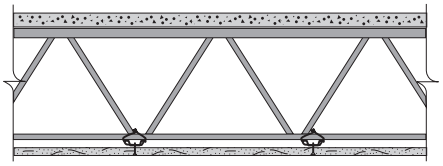


Weight per Sq. Ft.: 3.0 (15 Kg/m^2)

One layer 5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" (15.9 mm) DensArmor Plus® Fireguard C® interior panels applied perpendicular to resilient furring channels with 1" Type S drywall screws 12" o.c. Resilient channels spaced 12" o.c. when insulation is used or 16" o.c. when no insulation is used. Resilient channels applied perpendicular to bottom chord of light-gauge steel trusses 48" o.c. with 1/2" Type S-12 screws. Optional glass fiber or mineral fiber batt or loose fill insulation applied directly over ToughRock Fireguard C gypsum board only. Trusses supporting 23/32" wood structural panel subfloor applied perpendicular to trusses with construction adhesive and mechanical fasteners 12" o.c. and 15/32" wood structural panel underlayment applied perpendicular to trusses with mechanical fasteners 12" o.c. Joints staggered between underlayment and subfloor.

1-1/2-Hour Fire Rating

Design Reference: UL G502, cUL G502, GA FC 1110

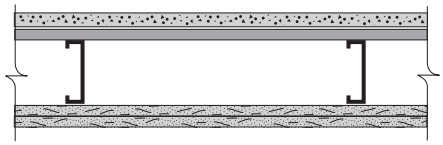


Weight per Sq. Ft.: 2.0 (10 Kg/m^2)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular 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

Design Reference: GA FC 2116



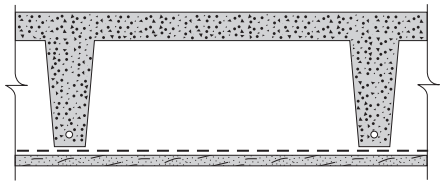
Weight per Sq. Ft.: 5.0 (24 Kg/m^2)

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® applied perpendicular 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 X™ gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard applied perpendicular 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

Design Reference: GA FC 2120



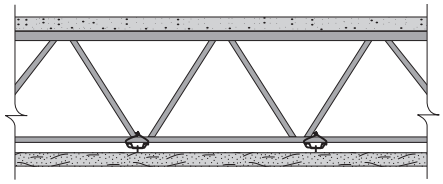
Weight per Sq. Ft.: 3.0 (15 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard applied perpendicular 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).

Floor/Ceiling Steel-Framed Assemblies continued

2-Hour Fire Rating

Design Reference: UL G505, cUL G505, GA FC 2130

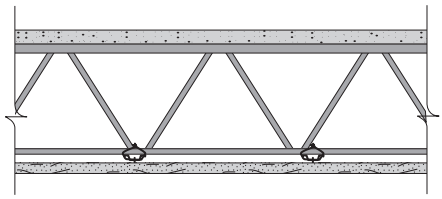


Weight per Sq. Ft.: 2.5 (12 Kg/m^2)

5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" (15.9 mm) DensArmor Plus® Fireguard C® (UL G505 only) applied perpendicular 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.)

2-Hour Fire Rating

Design Reference: UL G504, cUL G504

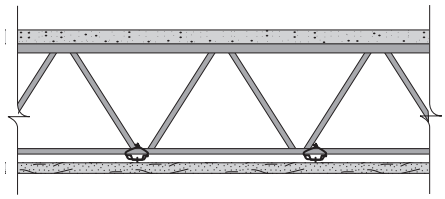


Weight per Sq. Ft.: 2.0 (10 Kg/m^2)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular 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

Design Reference: ULC I511, GA FC 2030



50-54 STC Sound Trans.

Test Reference: NGC 4075

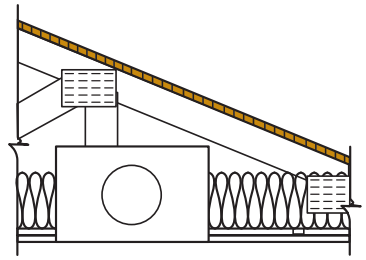
Weight per Sq. Ft.: 2.0 (10 Kg/m^2)

1/2" (12.7 mm) ToughRock Fireguard C or 1/2" (12.7 mm) DensArmor Plus Fireguard C gypsum board applied perpendicular to rigid furring 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 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 hours restrained and unrestrained.)

Roof/Ceiling Wood-Framed Assemblies

1-Hour Fire Rating

Design Reference: UL P552, cUL P552, GA RC 2610

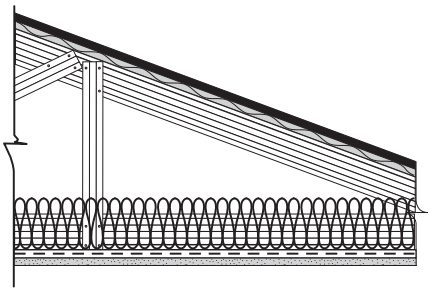


5/8" (15.9 mm) ToughRock Fireguard C or 5/8" (15.9 mm) DensArmor Plus Fireguard C applied perpendicular to the resilient channels spaced 16" (406 mm) o.c. with 1" (25 mm) Type S screws 12" (305 mm) o.c. Space channels 12" (305 mm) o.c. when insulation is draped over channels. End joints attached with 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. When DensArmor Plus Fireguard C is used batt insulation shall be secured to wood structural panels on trusses. 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).

Roof/Ceiling Steel-Framed Assemblies

1-Hour Fire Rating

Design Reference: UL P553, cUL P553, GA RC 2503



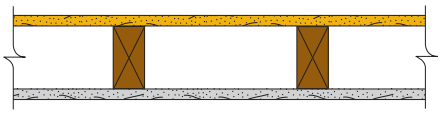
Weight per Sq. Ft.: 3.0 (15 Kg/m^2)

One layer 5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" (15.9 mm) DensArmor Plus® Fireguard C® interior panels applied to resilient or rigid furring channels with 1" (25.4 mm) Type S drywall screws 12" (305 mm) o.c. Channels spaced 12" (305 mm) o.c. when insulation is used or 16" (406 mm) o.c. when no insulation is used. Resilient channels applied perpendicular to bottom chord of pitched or parallel chord steel trusses 48" o.c. with 1/2" (12.7 mm) Type S-12 screws. Optional glass fiber or mineral fiber batt or loose fill insulation applied directly over ToughRock Fireguard C gypsum board only. Trusses supporting metal roof deck panels covered by 1/2" (12.7 mm) regular gypsum sheathing either loose laid, or adhesively or mechanically attached to roof deck. Any thickness polyisocyanurate foamed plastic; polystyrene foamed plastic; or mineral fiber or glass fiber insulation boards laid over gypsum sheathing and covered by a Class A, B or C roof covering.

Exterior Wood-Framed Wall Assemblies

1-Hour Fire Rating

Design Reference: UL U305, cUL U305



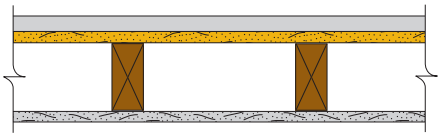
30-34 STC Sound Trans.
Test Reference: OR 648
Partition Thickness: 4-3/4 (121 mm)
Weight per Sq. Ft.: 7.5 (37 Kg/m^2)

Exterior Side: 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing applied vertically or horizontally 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 X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically or horizontally to studs with 1-7/8" (48 mm) 6d coated 7" (178 mm) o.c. Stagger joints each side.

1-Hour Fire Rating

Design Reference: UL U309, cUL U309, GA WP 8109, GA WP 3510



35-39 STC Sound Trans.
Test Reference: NGC 2404
Partition Thickness: Varies
Weight per Sq. Ft.: 9.0 (44 Kg/m^2)

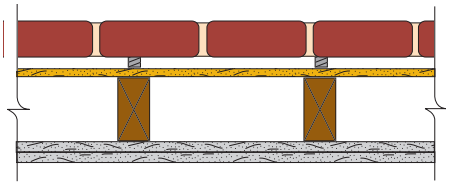
Exterior Side: 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied vertically or horizontally to 2"x 4" wood studs 24" (610 mm) o.c. with 1-7/8" (48 mm) galvanized roofing nails 7" (178 mm) o.c. Joints of gypsum sheathing may be left untreated. Exterior cladding to be attached through sheathing to studs.

Interior Side: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally to studs with 1-7/8" (48 mm) 6d coated nails 7" (178 mm) o.c.

Exterior Wood-Framed Wall Assemblies continued

2-Hour Fire Rating

Design Reference: UL U302, ULC U302, cUL U302, GA WP 8410



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

Interior Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board applied vertically or horizontally 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically or horizontally to studs with 2-3/8" (60 mm) 8d coated nails 8" (203 mm) o.c.

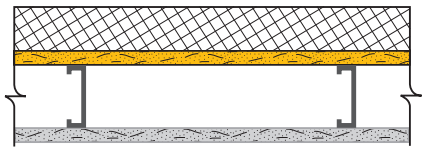
Exterior Base Layer: 1/2" (12.7 mm) DensGlass® Sheathing applied vertically or horizontally to studs with 1-3/4" (45 mm) galvanized roofing nails 6" (152 mm) o.c.

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

Design Reference: GA WP 8122



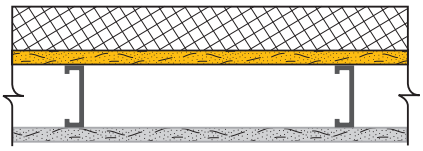
Partition Thickness: 6"– 7" (152 mm – 178 mm), varies based on insulation thickness Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

Exterior Side: 5/8" (15.9 mm) DensGlass® Fireguard® Sheathing applied vertically 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 X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically 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

Design Reference: GA WP 8123



Partition Thickness: 6"– 9" (152 mm – 229 mm), varies based on insulation thickness Weight per Sq. Ft.: 7.0 (34 Kg/m^2)

Exterior Side: 5/8" (15.9 mm) DensGlass Fireguard Sheathing applied vertically 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.

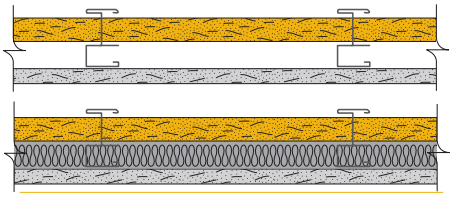
Interior Side: One layer 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board applied vertically to studs with #6 x 1-1/4" (32 mm) self-drilling, bugle head drywall screws 8" (203 mm) o.c. at edges and ends and 12" (305 mm) o.c. at intermediate studs.

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

Design Summary Vertical – Shaftwall Assemblies

1-Hour Fire Rating

Design Reference: WHI Design GP/WA 60-01, GA WP 6855



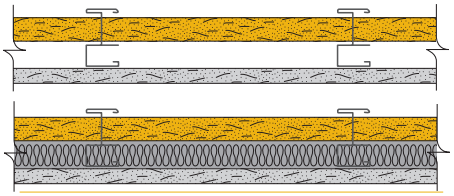
43 STC Sound Trans.
Test Reference: RAL TL 09-357
Approx. Weight: 7 psf (34 Kg/m^2)

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 X™ 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)

1-Hour Fire Rating

UL V473, cUL V473, GA WP 6851



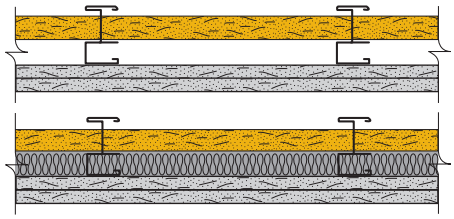
43 STC Sound Trans.
Test Reference: RAL TL 09-357
Approx. Weight: 7 psf (34 Kg/m^2)

Fiberglass sound insulation thickness is 1" (25 mm), 2-1/2" (64 mm) and 3-1/2" (89 mm) for C-T or C-H stud(s) 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 X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board installed vertically.

C-T or C-H 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)

2-Hour Fire Rating

Design Reference: UL V473, ULC W481, cUL V473, GA WP 7054



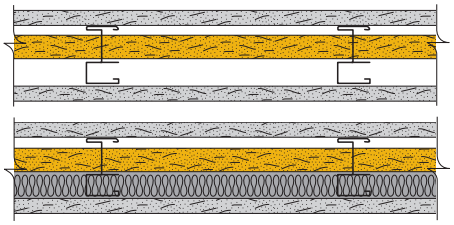
51 STC Sound Trans.
Test Reference: RAL TL 09-358
Approx. Weight: 10 psf (49 Kg/m^2)

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 X™ 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)

2-Hour Fire Rating

Design Reference: UL V473, ULC W481, cUL V473, GA WP 7059



46 STC Sound Trans.
Test Reference: RAL TL 09-359
Approx. Weight: 10 psf (49 Kg/m^2)

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 both sides with 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard board installed horizontally or vertically. Edges and ends offset 24" (610 mm) o.c.

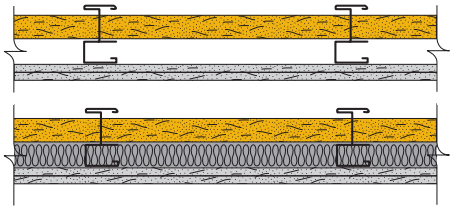
C-T or C-H Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	3-3/4" (95 mm)	5-1/4" (133 mm)	7-1/4" (184 mm)

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

Design Summary Vertical – Shaftwall Assemblies continued

2-Hour Fire Rating

Design Reference:
WHI Design GP/WA 120-01, GA WP 7054.4



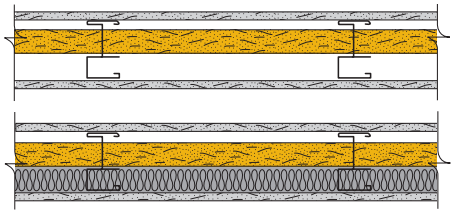
50 STC Sound Trans.
Test Reference: RAL TL 09-360
Approx. Weight: 9 psf (44 Kg/m^2)

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)

2-Hour Fire Rating

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



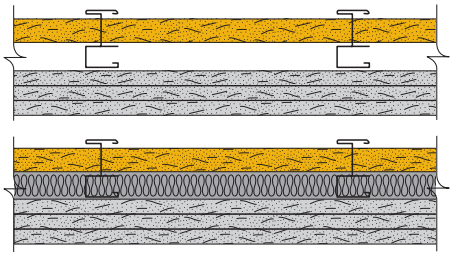
46 STC Sound Trans.
Test Reference: RAL TL 09-359
Approx. Weight: 9 psf (44 Kg/m^2)

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)

3-Hour Fire Rating

Design Reference: WHI GP/WA 180-01, GA WP 7422



51 STC Sound Trans.
Test Reference: RAL TL 09-358
Approx. Weight: 12 psf (59 Kg/m^2)

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 three layers of 5/8" (15.9 mm) ToughRock Fireguard C gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard C installed horizontally or vertically per test reference. Edges and ends offset 24" (610 mm) o.c.

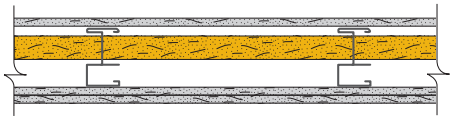
C-T, C-H or I Stud	2-1/2" (64 mm)	4" (102 mm)	6" (152 mm)
Wall Thickness	4-3/8" (111 mm)	5-7/8" (149 mm)	7-7/8" (200 mm)

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

Design Summary Horizontal – Shaftwall Assemblies

2-Hour Fire Rating

Design Reference: WHI-495-PSH-0128

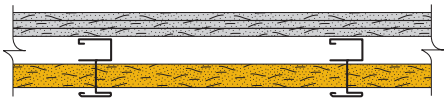


Approx. Weight: 11 psf (54 Kg/m^2)

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.

2-Hour Fire Rating

Design Reference: WHI-495-PSH-0153, WHI-495-PSH-0197

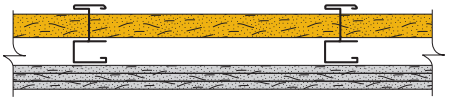


Approx. Weight: 11 psf (54 Kg/m^2)

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.

2-Hour Fire Rating

Design Reference: WHI-495-PSH-0183, WHI-495-PSH-0196, WHI Design GP/CC 120-01



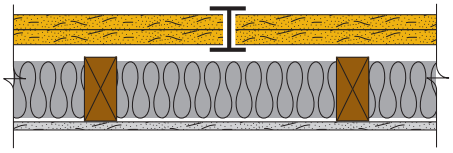
Approx. Weight: 11 psf (54 Kg/m^2)

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.

System Assemblies – 2-Hour Ratings – Area Separation Walls

2-Hour Fire Rating

Design Reference: UL U373, ULC W312, WHI GP/WA 120-03, cUL U373



59 STC Sound Trans.

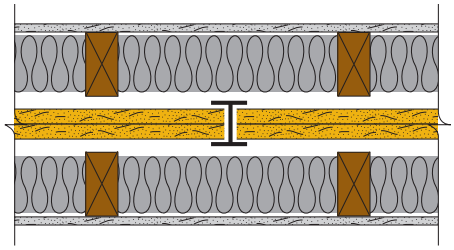
Test Reference: RAL TL 10-290

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.

Sound Tested with 2"x 4" stud wall with 1/2" (12.7 mm) ToughRock® wallboard or DensArmor Plus® interior panels and 3-1/2" (89 mm) fiberglass insulation in stud space.

2-Hour Fire Rating

Design Reference: UL U373, ULC W312, WHI GP/WA 120-04, cUL U373, GA ASW 0810



66 STC Sound Trans.

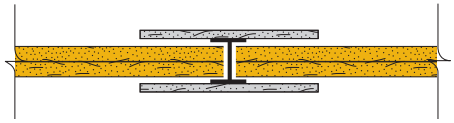
Test Reference: RAL TL 10-291

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) ToughRock gypsum wallboard or DensArmor Plus interior panels each side of assembly and 3-1/2" (89 mm) fiberglass insulation in stud space both sides.

2-Hour Fire Rating

Design Reference: WHI 495-0743



38 STC Sound Trans. Est.

Part. Thickness: 3" (76 mm)

Weight per Sq. Ft.: 9.5 (46 Kg/m^2)

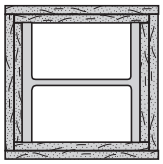
Two layers 1" (25.4 mm) DensGlass Shaftliner inserted in H-Studs 24" (610 mm) o.c. Metal covered using 6" (152 mm) wide 1/2" (12.7 mm) DensArmor Plus Fireguard C interior panels or 1/2" (12.7 mm) ToughRock Fireguard C gypsum board.

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

Column Fire-Resistant Assemblies

1-Hour Fire Rating

Design Reference: NBS 303*

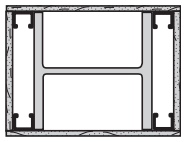


Base Layer: 1/2" (12.7 mm) ToughRock® Fireguard C® gypsum board tied to W10 x 49 (metric W250 x 73)column 1 hr. with 18-gauge (43 mils) wire 15" (381 mm) o.c.

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

2-Hour Fire Rating

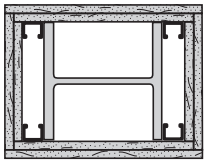
Design Reference: UL X520, GA CM 2110, cUL X520



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 233 (metric W360 x 347) column. 1-1/4" (32 mm) steel corner bead crimp-attached at 6" (152 mm) intervals.

2-Hour Fire Rating

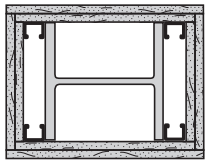
Design Reference: UL X517, cUL X517, GA CM 2120



Two layers of 5/8" (15.9 mm) ToughRock® Fireguard X™ 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 (metric W250 x 73) 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

Design 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 233 (metric W360 x 347) 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.

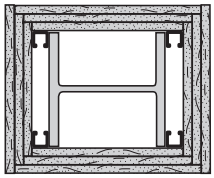
** Test conducted with generic Type X gypsum wallboard in December 1952. Contact GP Technical Service Hotline for a copy of the test report.*

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

Column Fire-Resistant Assemblies continued

3-Hour Fire Rating

Design Reference: UL X509, ULC Z502, cUL X509



Three layers of 5/8" (15.9 mm) ToughRock® Fireguard C® gypsum board or 5/8" (15.9 mm) DensArmor Plus® Fireguard C® (UL X509 only), screw-attached to 1-5/8" (41 mm) steel studs located at each corner of W10 x 49 (metric W250 x 73) column.

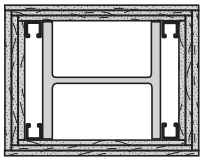
Base Layer: Attached with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

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

Design Reference: UL X528, cUL X528, GA CM 3116



Three layers of 5/8" (15.9 mm) ToughRock Fireguard C or 5/8" (15.9 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 (metric W250 x 73) column.

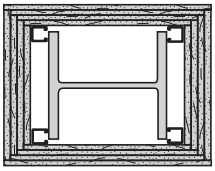
Base Layer: Attached with 1" (25 mm) Type S drywall screws 24" (610 mm) o.c.

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

Design Reference: UL X501, cUL X501



Four layers of 5/8" (15.9 mm) ToughRock Fireguard C gypsum board or 5/8" (15.9 mm) DensArmor Plus Fireguard C covering W10 x 49 (metric W250 x 73) 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.

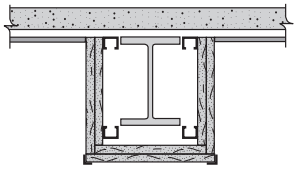
Outer Layer: Gypsum board attached to the sheet metal angles with 1-5/8" (41 mm) long self-drilling, self-tapping screws spaced vertically 12" (305 mm) o.c.

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

Beam Fire-Resistant Assemblies

2-Hour Fire Rating

Design Reference: UL N502, ULC 0502, GA BM 2130



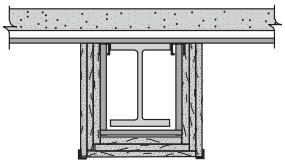
Two layers of 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum board around minimum W8 x 24 (metric W200 x 36) beam.

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

Design Reference: UL N505



Three layers of 5/8" (15.9 mm) ToughRock® Fireguard X™ or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum board around minimum W8 x 24 (metric W200 x 36) 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 (33 mils) 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.)

Abbreviations

ACI	Acoustical Consultants Inc.
CK	Cedar Knolls Acoustical Laboratories (Noise Unlimited, Inc.)
cUL	UL LLC (Canadian Listed)
DRC	Domtar Research Centre
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
RAL	Riverbank Acoustical Laboratories
STC	Sound Transmission Class
UL	UL LLC
ULC	Underwriters' Laboratories of Canada
WEAL	Western Electro Acoustical Laboratory, Inc.
WHI	Warnock Hersey International (ITS)

Georgia-Pacific UL and ULC Type Designations

The Fire Resistance Directory published by UL cites gypsum panel products classified for fire resistance under the category "Gypsum Board (CKNX,CKNX7)." Underwriters Laboratories of Canada (ULC) cites gypsum panel products classified for fire resistance under the category "Gypsum Board (CKNXC)." Each UL or ULC 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 or ULC Type designation appears on the UL or ULC label and on the product. Gypsum board end tapes and product literature generally contain product names or trademarks, not UL or ULC Type designations. The following table provides a quick and easy reference to identify current Georgia-Pacific Gypsum products and their designations in the UL and ULC Directories.

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

Georgia-Pacific UL and ULC Type Designations

UL Type Designation	Product Name
Type TG-C	1/2" (12.7 mm) ToughRock® Fireguard C® Gypsum Board 1/2" (12.7 mm) ToughRock® Fireguard C® Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Soffit Board
Type X	5/8" (15.9 mm) ToughRock® Fireguard X™ Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Gypsum Sheathing 5/8" (15.9 mm) ToughRock® Fireguard X™ Veneer Plaster Base 5/8" (15.9 mm) ToughRock® Fireguard X™ Abuse-Resistant Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Mold-Guard™ Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Mold-Guard™ Abuse-Resistant Gypsum Board
Type TP-6	1" (25.4 mm) ToughRock® Shaftliner
Type DGG	5/8" (15.9 mm) DensGlass® Fireguard® Sheathing
Type DD	5/8" (15.9 mm) DensDeck® Fireguard® Roof Board 5/8" (15.9 mm) DensDeck® Fireguard® Prime Roof Board 5/8" (15.9 mm) DensDeck® Fireguard® Duraguard Roof Board
Type DS	5/8" (15.9 mm) DensShield® Fireguard® Tile Backer
Type DAP	5/8" (15.9 mm) DensArmor Plus® Fireguard® 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
Type DAPC	1/2" (12.7 mm) DensArmor Plus® Fireguard C® Interior Panel 5/8" (15.9 mm) DensArmor Plus® Fireguard C® Interior Panel

ULC Type Designation	Product Name
Type C	1/2" (12.7 mm) ToughRock® Fireguard C® Gypsum Board 1/2" (12.7 mm) ToughRock® Fireguard C® Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard C® Soffit Board
Type X	5/8" (15.9 mm) ToughRock® Fireguard X™ Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Stretch 54® Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Gypsum Sheathing 5/8" (15.9 mm) ToughRock® Fireguard X™ Veneer Plaster Base 5/8" (15.9 mm) ToughRock® Fireguard X™ Abuse-Resistant Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Mold-Guard™ Gypsum Board 5/8" (15.9 mm) ToughRock® Fireguard X™ Mold-Guard™ 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 5/8" (15.9 mm) DensDeck® Fireguard® Prime Roof Board 5/8" (15.9 mm) DensDeck® Fireguard® Duraguard Roof Board
Type DS	5/8" (15.9 mm) DensShield® Fireguard® Tile Backer
Type DAP	5/8" (15.9 mm) DensArmor Plus® Fireguard® 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
Type DAPC	1/2" (12.7 mm) DensArmor Plus® Fireguard C® Interior Panel 5/8" (15.9 mm) DensArmor Plus® Fireguard C® Interior Panel

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

High-Performance Gypsum Products from Georgia-Pacific

DensDeck® Roof Board	Fiberglass mat roof board used as the ideal thermal barrier and cover board to improve resistance to wind uplift, hail, foot traffic, fire and mold in a broad range of commercial roofing applications. Look for DensDeck Prime and DensDeck DuraGuard Roof Boards, too.
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. GREENGUARD listed for microbial resistance.
DensGlass® Shaftliner	These specially-designed panels are perfect 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® 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 and GREENGUARD Gold certified for low VOC emissions. Listed in CHPS® High Performance Product Database as a low emitting product. GREENGUARD listed for microbial resistance.
DensArmor Plus® Abuse-Resistant Interior Panel	With the same benefits as the DensArmor Plus® Interior Panel, these also offer added resistance to scuffs, abrasions and surface indentations; ideal for healthcare facilities and schools. GREENGUARD and GREENGUARD Gold certified for low VOC emissions. Listed in CHPS® High Performance Product Database as a low emitting product. GREENGUARD listed for microbial resistance.
DensArmor Plus® Impact-Resistant Interior Panel	With even greater durability than abuse-resistant panels, these have an embedded impact-resistant mesh for the ultimate resistance in high traffic areas; ideal for healthcare facilities, schools and correctional institutions. GREENGUARD and GREENGUARD Gold certified for low VOC emissions. Listed in CHPS® High Performance Product Database as a low emitting product. GREENGUARD listed for microbial resistance.
DensShield® Tile Backer	Acrylic-coated tile backer stops moisture at the surface. Lightweight and strong, they are built for speed on the job site. Conforms to requirements of 2012 IBC/IRC Code. GREENGUARD listed for microbial resistance.
ToughRock® Gypsum Board	Paper-faced line of gypsum panels for a variety of applications including interior wall and ceiling applications, abuse-resistant boards, and panels for use in fire-rated assemblies. ToughRock products are GREENGUARD and GREENGUARD Gold certified for low VOC emissions. Listed in CHPS® High Performance Product Database as a low emitting product.
ToughRock® Mold-Guard™ Gypsum Board	ToughRock Mold-Guard Gypsum Board products have enhanced mold resistance in comparison to regular ToughRock® Gypsum Boards. They are GREENGUARD and GREENGUARD Gold Certified for low VOC emissions and are listed in the CHPS® High Performance Product Database as a low emitting product. The ToughRock Mold-Guard Gypsum Board is also listed as GREENGUARD microbial resistant.

Georgia-Pacific Gypsum

U.S.A. Georgia-Pacific Gypsum LLC
Georgia-Pacific Gypsum II LLC
CANADA Georgia-Pacific Canada LP

SALES INFORMATION AND ORDER PLACEMENT

U.S.A.
West: **1-800-824-7503**
Midwest: **1-800-876-4746**
South Central: **1-800-231-6060**
Southeast: **1-800-327-2344**
Northeast: **1-800-947-4497**

CANADA
Canada Toll Free: **1-800-387-6823**
Quebec Toll Free: **1-800-361-0486**

TECHNICAL HOTLINE

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

CAUTION: For product fire, safety and use information, go to buildgp.com/safetyinfo or call 1-800-225-6119.

www.gpgypsum.com