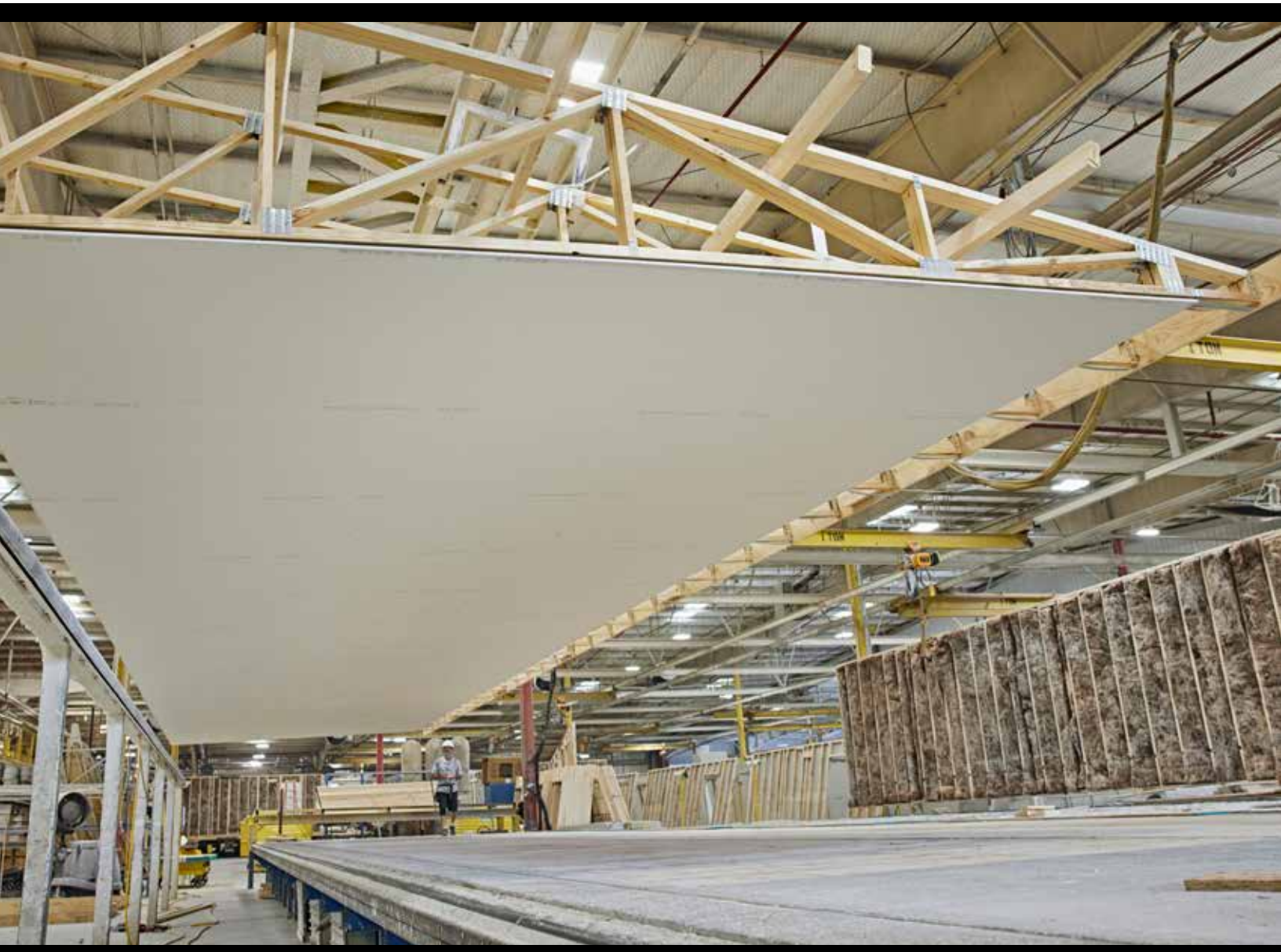


Factory Built Housing Construction Guide

National Gypsum®

Exclusive services provider for products manufactured by Gold Bond Building Products, LLC, ProForm Finishing Products, LLC and PermaBASE Building Products, LLC.

Gold Bond®
Building Products

Start with the Best Gypsum Board

Gold Bond Building Products, LLC manufactures a complete line of gypsum board products to meet manufactured housing requirements.
Our gypsum board product line-up includes a variety of sizes – with the performance you expect from the Gold Bond brand.

Key products:

- Gold Bond® High Strength LITE® Gypsum Board is a preferred solution for both walls and ceilings, saving time and cost.
- Gold Bond® Seaspray Hi-Strength MVR® Ceiling Panels are a prefinished, ready-to-use ceiling product that saves time in the manufacturing process.
- Gold Bond® Durabase® Gypsum Board is utilized by laminators to provide pre-decorated wall board to manufacturers.

Our GridMarX® installation guide marks are printed on standard width Gold Bond products to help installers instantly identify stud locations and make accurate cuts without having to pencil in or snap chalk lines. GridMarX guide marks have consistently proven to help reduce material costs and increase efficiency.

Select products are GREENGUARD certified for low chemical emissions into indoor air during product usage. Visit the Design & Resource Center on nationalgypsum.com for details.


1 TON

Gold Bond® Products

Gold Bond® HUD Gypsum Board

Use Gold Bond® HUD Gypsum Board for interior, non-fire-rated wall and ceiling applications. It has a fire-resistant gypsum core encased in a heavy, natural finish with 100% recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are tapered and finished smooth.

Thickness: 1/2" (12.7 mm) / Regular
Width: 4' (1,219 mm)
Length: 7' - 16' (2,134 - 4,877 mm)

ADVANTAGES

- Tapered
- Features GridMarX® guide marks
- ASTM C1396

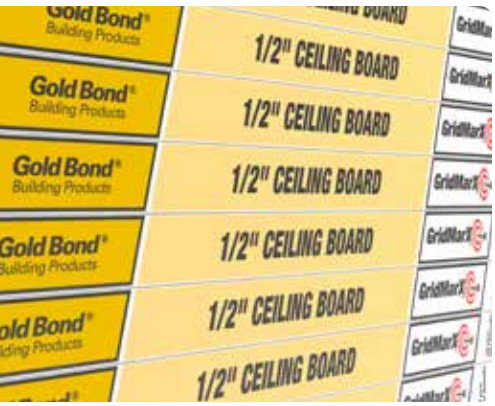
Gold Bond® Fire-Shield® Gypsum Board

Use Gold Bond® Fire-Shield® for interior, fire-rated wall and ceiling applications. A specially formulated Type C core is also available where required. This gypsum board consists of a fire-resistant gypsum core with a heavy, natural finish and 100% recycled paper on the face and back sides. The face paper folds around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Thickness: 1/2" (12.7 mm) / Type C
5/8" (15.9 mm) / Type X or Type C
Width: 1/2" Type C, 4' (1,219 mm)
5/8" Type X or Type C, 4' (1,219 mm) and 54" (1,372 mm)
Length: 8' – 12' (2,438 - 3,658 mm)

ADVANTAGES

- Square or Tapered Edge
- Features GridMarX® guide marks
- ASTM C1396



Gold Bond® Ceiling Board

Gold Bond® Ceiling Board is a specialty gypsum board encased in 100% recycled paper with increased uniformity and integrity of its gypsum core, making its sag resistance equivalent to 5/8" Type X gypsum board.

This 1/2" Ceiling Board is specifically designed for ceilings where framing members are spaced up to 24" o.c. and a water-based texture will be used.

Thickness: 1/2" (12.7 mm) / Regular
Width: 4' (1,219 mm)
Length: 8' - 16' (2,438 - 4,877 mm)

ADVANTAGES

- Tapered Edge
- Features GridMarX® guide marks
- ASTM C1396

Gold Bond® High Strength LITE® Gypsum Board

Gold Bond® High Strength LITE® Gypsum Board is a specialty gypsum board formulated to be 25% lighter than original 1/2" High Strength Gypsum Board. The result is a superior board that is lighter in weight, sag resistant, and easier to handle.

High Strength LITE® Gypsum Board can be used for walls and ceilings in non-fire rated single layer construction where framing members are spaced up to 24" o.c. Because it can be installed on both walls and ceilings, it eliminates the need for two different types of gypsum board on the job.

Thickness: 1/2" (12.7 mm) / Regular
Width: 4' (1,219 mm)
54" (1,372 mm)
Length: 8' - 16' (2,438 - 4,877 mm)
10' - 16' (3,048 - 4,877 mm)

ADVANTAGES

- Tapered or Square Edge
- Features GridMarX® guide marks
- ASTM C1396

Gold Bond® High Flex® Gypsum Board

Use Gold Bond® High Flex® for interior, non-fire-rated wall and ceiling applications. High Flex® is ideal for concave and convex surfaces, such as walls, arches and vaulted ceilings. Apply it in double layers. This gypsum board consists of a fire-resistant gypsum core encased in a heavy, natural finish with 100% recycled paper on the face and back sides. The face paper is folded around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Thickness: 1/4" (6.4 mm) / Regular

Width: 4' (1,219 mm)

Length: 8' (2,438 mm)

ADVANTAGES

- Slightly Tapered Edge
- Features GridMarX® guide marks
- ASTM C1396

Gold Bond® XP® Gypsum Board

Use Gold Bond® XP® Gypsum Board on walls and ceilings where framing members are spaced up to 24" (610mm). It is available with either a Regular, Fire-Shield® Type X or Fire-Shield® Type C gypsum core. XP® Gypsum Board consists of a mold-, mildew-, moisture- and fire-resistant core with specially designed PURPLE paper. The PURPLE face paper is heavy, 100% recycled and offers superior mold, mildew and moisture resistance. The 100% recycled gray back paper is also mold-, mildew- and moisture-resistant.

Thickness: 1/2" (12.7 mm) / Regular, Type C
5/8" (15.9 mm) / Type X or Type C

Width: 4' (1,21 mm)

Length: 8' - 12' (2,438 - 3,658 mm)

ADVANTAGES

- Tapered or Square Edge
- Features GridMarX® guide marks
- ASTM C1396

Gold Bond® Durabase® Gypsum Board

Durabase® Gypsum Board is an excellent substrate for a variety of decorative laminates to use as wall panels in factory built housing. This fire- and impact-resistant gypsum board also creates quieter spaces due to its sound-damping properties.

Thickness: 3/8" (9.5 mm)
1/2" (12.7 mm)
5/8" (15.9 mm)

Width: 4' (1,21 9mm)

Length: 7' - 10' (2,134 - 3,048 mm)

ADVANTAGES

- UL labeled and meets all HUD manufactured home construction and safety standards, including fire-safety requirements (flame spread not over 25).
- Square edge. Cuts quickly and installs easily.
- Cost effective and adaptable to paper or vinyl laminates.

Gold Bond® Seaspray Hi-Strength MVR® Ceiling Panels

Seaspray® Hi-Strength MVR is a prefinished decorative ceiling panel. It provides an attractive textured ceiling and a code-approved moisture/vapor retarder in one efficient product. Seaspray is manufactured with a high-strength gypsum core that is more sag resistant.

Thickness: 1/2" (12.7 mm)
3/8" (9.5 mm)

Width: 4' (1,219 mm)

Length: 7' – 16' (2,134 – 4,877 mm)

ADVANTAGES

- Helps hide joints due to heavier texture.
- 5-year limited warranty against sag when foam adhesive attachment is used with trusses spaced 24" o.c.
- Assures uniform performance (vapor retarder built into the finish).
- Resists surface marking due to durable latex finish.
- Meets code standards of 1 perm or less for vapor retarder characteristics.

Gypsum Board Handling, Storage And Project Conditions

- Use caution and care when moving gypsum board; the panels are heavy and must be moved using proper lifting techniques or equipment.
- Protect the board edges, corners and ends during transport or in high-traffic areas.
- Storage temperatures should not exceed 125˚F (52˚C).
- Store panels flat and level. Storing them upright could damage the edges, and creates a danger to employees.
- When storing or stacking multiple layers, use risers or spacers between layers.
- Risers must be vertically aligned from top to bottom to prevent sagging or bowing.

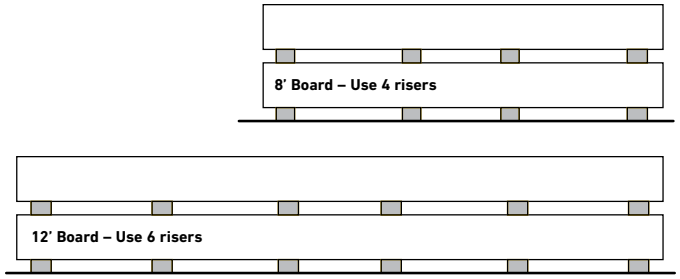
HANDLING AND PROJECT CONDITIONS

- Avoid water exposure during shipping, handling, storage, installation and after installation of gypsum board to avoid the formation of mold or mildew.
- Remove non-breathable shipping wrap material upon receiving and storing gypsum board.
- Store gypsum board off the ground and under cover. Use sufficient supports extending under the entire length of gypsum board to prevent sagging.
- Keep gypsum board dry to minimize the potential for mold growth. Take adequate care while transporting, storing, applying and maintaining gypsum board. For additional information, refer to GA-238, which is available at gypsum.org under the "Download Free Gypsum Association Publications" section.
- Protect gypsum board from the elements and maintain in good condition prior to and following installation. Stack panels flat, with care taken to prevent sagging or damage to edges, ends or surfaces.
- Reject gypsum board with visible signs of mold growth. Do not apply gypsum board over other building materials where conditions exist that are favorable to mold growth.
- Do not exceed 95˚F (35˚C) when a temporary heat source is used.
- Maintain a room temperature of not less than 40˚F (4˚C) during application of gypsum board.
- Refer to GA-801 for complete handling and storage instructions.

MAINTENANCE FOLLOWING APPLICATION

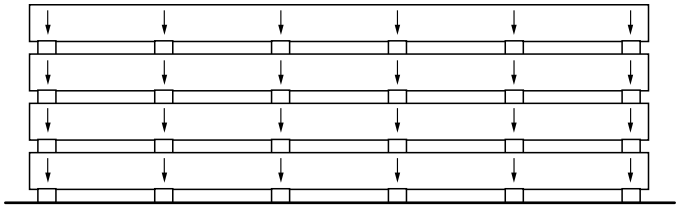
- Maintain essential elements of sound weather-tight building envelope, including roofing, joint sealants, windows and flashings.
- Take immediate and appropriate remediation measures as soon as water leaks or condensation sources are identified.
- Perform routine cleaning and maintenance operations using methods that prevent moisture saturation of gypsum board.

RISERS EVENLY SPACED



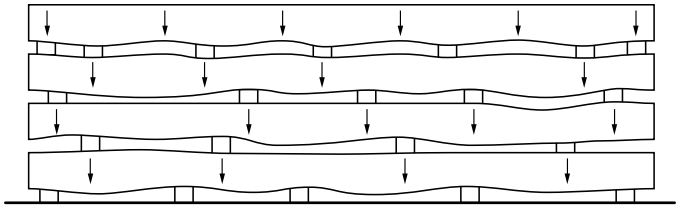
CORRECT METHOD OF PLACING RISERS

Note that all risers are placed in proper vertical alignment so each tier is evenly supported. Arrows indicate pressure.



INCORRECT METHOD OF PLACING RISERS

Cumulative pressure on unsupported lower units causes gypsum board to sag. Risers are not spaced evenly or in proper vertical alignment.



Quick Selector For Shear-Tested Systems

WALL ASSEMBLIES

Application Ref.	Adhesive	Fasteners	Type	Orientation	On Center	Ultimate Shear	Design Shear	Board Size	Report
W001	Tanco XA2600 Swift-49109 National Starch Elixir Instant Bond	2x3 plates & 2x3 studs	One Side	Vertical	16"	638		5/16", 3/8, 1/2", 5/8"	UL Project 89NK27074 (Application 1)
W002	Tanco XA2600 Swift-49109 National Starch Elixir Instant Bond	1x3 plates & 2x3 studs	One Side	Vertical	16"	554		5/16", 3/8, 1/2", 5/8"	UL Project 89NK27074 (Application 2)
W003	Tanco XA2600 Swift-49109 National Starch Elixir Instant Bond	1x3 plates & 2x3 studs 1x3 plates & 2x3 studs 1x3 plates & 2x3 studs 1x3 plates & 2x3 studs	One Side	Vertical	16"	561		5/16", 3/8, 1/2", 5/8"	UL Project 89NK27074 (Application 3)
W006	Foamseal F2100	1x3 plates & 2x3 studs	One Side	Vertical	24"	610	244	5/16"	PE 94-764
W007	Foamseal F2100	1x3 plates & 2x3 studs	One Side	Horizontal	16"	667	266	1/2"	PE 91-1890
W008	Foamseal F2100 & PR-32	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	680	272	5/16"	PE 91-2094
W009	Foamseal Elasto-Bondz Urethane	2x3 plates & perimeter studs 1x3 interior studs	Two Sides	Horizontal	16"	756	302	1/2"	PE 93-1494
W010	Foamseal F2100	1x3 T plate 2x3 B plate 2x3 studs	One Side	Vertical	16"	782	313	5/16"	PE 94-388
W011	Foamseal F6000	1x3 plates & 2x3 studs	One Side	Vertical	16"	608	243	5/16"	PE 96-652
W012	Foamseal F6300	2x3 plates & 2x3 studs	One Side	Vertical	16"	642	257	5/16"	PE 97-610
W013	Pemco 5100	1x3 plates & 2x3 studs	One Side	Vertical	16"	747	298	5/16"	PE 95-1344
W014	Pemco 5100	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	747	298	5/16"	PE 95-1345
W015	Pemco 5100	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	538	215	5/16"	NTA96-0529-4
W016	Pemco 5100	1x3 plates & 2x3 studs	One Side	Vertical	16"	819	327	5/16"	NTA96-0212-3
W017	Tacc International Gun 'N Go	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	506	203	5/16"	NTA96-0105-3
W018	Tacc International Gun 'N Go	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	600	240	5/16"	NTA970115-1
W019	Tacc International Gun 'N Go	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	563	225	5/16"	NTA970154-1
W020	Clayton Touch 'N Seal	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	561	225	5/16"	NTA970115-1
W024	Dow Chem. EnerBond DW	1x3 plates & 2x3 studs	One Side	Vertical	16"	494	197	5/16"	CLT AB96-10
W025	Dow Chem. EnerFoam	1x3 plates & 2x3 studs	One Side	Vertical	16"	486	194	5/16"	BR10585A-06
W026	Dow Chem. EnerFoam	2x3 T plates 1x3 B plate & 2x3 studs	One Side	Vertical	16"	467	186	5/16"	CTL AB95-01
W027	Foamseal F6300 & F6400	1x3 plates & 1x3 & 3x3 studs	One Side	Vertical	16"	388	155	5/16"	PE 97-1388 C
W028	Tacc International Sta Sealed 910	1x3 plates & 2x3 studs	One Side	Vertical	16"	452	181	5/16"	NTA970012-1
W029	Tacc International MH 9000	1x3 plates & 2x3 studs	One Side	Vertical	16"	690	276	5/16"	PE 95-304
W030	Dow Chem. EnerBond MH	1x3 plates & 2x3 studs	One Side	Vertical	16"	649	260	5/16"	CLT FP98-01
W031	Dow Chem. EnerFoam	1x3 plates & 2x3 studs	One Side	Vertical	16"	539	216	5/16"	CLT FP98-02
W032	Dow Chem. EnerBond SF	1x3 plates & 2x3 studs	One Side	Vertical	16"	739	296	5/16"	CLT FP98-03
W033	Dow Chem. EnerFoam	1x3 plates & 2x3 studs	One Side	Vertical	16"	638	255	5/16"	CLT FP98-04
W034	Voramar AA 3022 (Dow)	1x3 plates & 2x3 studs	One Side	Vertical	16"	529	211	5/16"	PE 2001-631
W035	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	One Side	Vertical	16"	454	181	5/16"	PE 2001-710 A

Quick Selector For Shear-Tested Systems (continued)

WALL ASSEMBLIES

Application Ref.	Adhesive	Fasteners	Type	Orientation	On Center	Ultimate Shear	Design Shear	Board Size	Report
W036	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	One Side	Vertical	16"	766	306	5/16"	NTA 990011A
W037	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	One Side	Vertical	16"	660	264	5/16"	NTA 200121A
W038	FSI Foamnail	1x3 plates & 2x3 studs	One Side	Horizontal	16"	573	229	1/2"	PE 99-1346 A
W039	FSI Foamnail	1x3 plates & 2x3 studs	One Side	Horizontal	16"	649	259	1/2"	PE 99-1346 B
W040	FSI Foamnail	2x3 plates & 2x3 studs	One Side	Vertical	16"	768	307	5/16"	PE 99-2792 C
W041	FSI Foamnail	1x3 plates & 2x3 studs	One Side	Vertical	16"	560	224	5/16"	PE 99-2462 D
W042	FSI Foamnail	2x3 plates & 2x3 studs	One Side	Vertical	16"	622	248	5/16"	PE 2001-1215 B
W043	Dow Chem. EnerBond BA	1x3 plates & 2x3 studs	One Side	Vertical	16"	526	210	5/16"	CLT FP00-04
W044	Alpha Systems 3100 PVA	1x3 plates & 2x3 studs	One Side	Horizontal	16"	596	222	1/2" LITE	PEI 2013-1370 A
W045	Alpha Systems P5100	1x3 plates & 2x3 studs	One Side	Horizontal	16"	556	238	1/2" LITE	PEI 2013-1370 B
W046	Dow Voramer ME 3513	1x3 plates & 2x3 studs	One Side	Horizontal	16"	685	274	1/2" LITE	PEI 2013-1370 C
W047	FSI FoamNail	1x3 plates & 2x3 studs	One Side	Horizontal	16"	641	256	1/2" LITE	PEI 2013-1370 D
W048	Henkel WL 2600 PVA	2x3 plates & 2x3 studs	One Side	Vertical	16"	365	146	1/2" LITE	UL Project 13NK07272 (Application 11) PEI 2013-623 A
W049	Alpha Systems 3100 PVA	2x3 plates & 2x3 studs	One Side	Horizontal	16"	632	253	1/2" LITE	PEI 2014-259 A
W050	Alpha Systems P5100	2x3 plates & 2x3 studs	One Side	Horizontal	16"	722	288	1/2" LITE	PEI 2014-259 B
W051	Dow Voramer ME 3513	2x3 plates & 2x3 studs	One Side	Horizontal	16"	795	318	1/2" LITE	PEI 2014-259 C
W052	FSI FoamNail	2x3 plates & 2x3 studs	One Side	Horizontal	16"	792	316	1/2" LITE	PEI 2014-259 D
W053	Alpha Systems P5100	1x3 bottom plate & 2x3 top plate and studs	One Side	Horizontal	16"	573	229	1/2" LITE	PEI 2016-1937 A
W054	Henkel WL 2600 PVA	2x3 plates & 2x3 studs	One Side	Horizontal	16"	540	216	1/2" LITE	PEI 2016-1937 B
W055	Alpha Systems P5100	1x3 plates & 2x3 studs	One Side	Horizontal	16"	502	201	1/2" LITE	PEI 2016-1937 C
W056	Henkel WL 2600 PVA	1x3 plates & 2x3 studs	One Side	Horizontal	16"	342	136	1/2" LITE	PEI 2016-1937 D
W057	ITW FoamSeal F6400 LRV	2x3 plates & 2x3 studs	One Side	Vertical	16"	471	188	1/2" LITE	PEI 2017-6271 C
W205	Foamseal F6300 & F6400	1x3 plates & 1x3 & 2x3 studs	Two Sides	Vertical	16"	677	270	5/16"	PE 97-1388 E
W206	Foamseal F2100 & F6200	2x3 plates & 2x3 studs	Two Sides	Vertical	16"	847	339	5/16"	PE 9601472 B
W207	Foamseal F6300	2x3 plates & 2x3 studs	Two Sides	Vertical	16"	1170	468	5/16"	PE 97-610 D
W208	Pemco 5100 & 3100	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	1093	437	5/16"	NTA96-0212-4
W209	Pemco 5100 & 3100	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	821	328	5/16"	NTA96-0529-3
W210	Tacc International Gun 'N Go	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	1004	401	5/16"	NTA 970154-2
W211	Tacc International Sta Sealed 910	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	854	342	5/16"	NTA 970012-2
W212	Tacc International Gun 'N Go	2x3 plates & 2x3 studs	Two Sides	Vertical	16"	1004	401	5/16"	NTA 970115-2
W213	Clayton Touch 'N Seal	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	918	_	5/16"	NTA 970115-2
W218	Dow Chem. EnerFoam	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	738	295	5/16"	CTL AB95-02
W219	Dow Chem. EnerFoam	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	1062	425	5/16"	CTL AB95-03
W220	Dow Chem. EnerFoam	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	982	393	5/16"	CTL FP98-05
W221	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	770	308	5/16"	PE 2001-710 B
W222	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	1047	419	5/16"	NTA 200121
W223	HB Fuller Parr CA-40	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	1062	425	5/16"	NTA 990011
W224	Dow Chem. EnerBond SF & BA	1x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1272	508	5/16"	CLT DCC01-01
W225	Dow Chem. EnerBond SF	2x3 T plates 1x3 B plate & 2x3 studs	Two Sides	Vertical	16"	1097	438	5/16"	CLT FP98-08
W226	Dow Chem. EnerBond SF	1x3 plates & 2x3 studs	Two Sides	Vertical	16"	1013	405	5/16"	CLT FP98-06
W227	Alpha Systems P5100	1x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1052	421	1/2" LITE	PEI 2013-1370 E
W228	Dow Voramer ME 3515	1x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1082	433	1/2" LITE	PEI 2013-1370 F
W229	FSI FoamNail	1x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1035	414	1/2" LITE	PEI 2013-1370 G
W230	Alpha Systems P5100	2x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1069	427	1/2" LITE	PEI 2014-259 E
W231	Dow Voramer ME 3513	2x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1106	442	1/2" LITE	PEI 2014-259 F
W232	FSI FoamNail	2x3 plates & 2x3 studs	Two Sides	Horizontal	16"	1178	471	1/2" LITE	PEI 2014-259 G

CEILING ASSEMBLIES

Application Ref.	Adhesive	Fasteners	Width Size	On Center	Span	Ultimate Shear	12-Hour Shear	Board Size	Report
M001	N/A	Staples & Rosettes or Staples	11' 8-1/4"	16"	28'	367	—	5/16", 3/8	UL Project 76NK3479 (Application A)
M002	N/A	Staples & Rosettes or Screws	11' 8-1/4"	16"	28'	367	—	1/2", 5/8"	UL Project 87NK4541 (Application B)
M003	N/A	Staples & Rosettes	11' 8-1/4"	16"	28'	303	—	5/16", 3/8	UL Project 77NK158 (Application C)
M004	N/A	Staples & Rosettes	11' 8-1/4"	16"	28'	303	—	1/2", 5/8"	UL Project 77NK158 (Application D)
M007	N/A	Staples & Rosettes	11' 9"	24"	28'	287	—	5/16"	PTL-Report 5-79CS-1
M010	N/A	Staples & Rosettes or Staples & Screws	11' 9"	24"	40'	—	260	5/16", 3/8, 1/2", 5/8"	UL Project 89NK18380 (Application N)
M013	N/A	Screws or Screws & Staples	13' 8"	24"	40'	—	249	5/16", 3/8, 1/2", 5/8"	UL Project 88NK3278 (Application H)
M015	N/A	Staples or Staples & Rosettes or Staples & Foamseal F2100	13' 8"	24"	40'	—	251	5/16", 3/8, 1/2", 5/8"	UL Project 88NK21384 (Application J)
M016 (Cathedral)	N/A	Staples, Staples & Rosettes or Staples & Screws	13' 8"	24"	40'	384	—	5/16", 3/8, 1/2", 5/8"	PE 90-1598
M019	N/A	Staples & Rosettes or Staples & Screws or Staples & Staples	15' 6"	24"	40'	—	218	5/16", 3/8, 1/2", 5/8"	UL Project 89NK27074 (Application O)
M020 (Cathedral)	N/A	Staples	13' 8"	24"	40'	295	118	1/2" LITE	UL Project 13NK07272 (Application P) PEI 2013-623 B
F001	Foamseal F2100	—	11' 8"	16"	28'	348	—	5/16", 3/8, 1/2", 5/8"	UL Project 77NK158 (Application E)
F002	Foamseal F2100	—	11' 8"	16"	28'	383	—	5/16", 3/8, 1/2", 5/8"	UL Project 82NK9974 (Application F)
F003 (Cathedral)	FSI Foamnail		9' 6"	24"	52'	550	—	5/16"	PE 99-1348 Addendum A
F005	Foamseal F2100	—	11' 8"	24"	32'	344	—	5/16", 3/8, 1/2", 5/8"	UL Project 82NK9974 (Application G)
F006	Foamseal F2100	—	11' 0"	24"	44'	655	—	5/16"	PE 95-1920
F007 (Cathedral)	Dow Voramer		11' 8"	24"	44'	641	—	5/16"	PE 97-1206 Addedum A
F008	Foamseal F2100	—	11' 9"	24"	44'	392	—	5/16", 3/8, 1/2", 5/8"	UL Project 89NK3257 (Application K)
F009	FSI Foamnail	—	11' 9"	24"	44'	567	—	5/16"	PE 97-1906 Addendum A
F011 (Cathedral)	Foamseal F2100		11' 9"	24"	48'	452	—	5/16"	PE 93-1066
F014	Foamseal F2100	—	11' 9"	24"	48'	429	—	5/16"	PE 93-1068
F015 (Cathedral)	Dow Voramer		11' 8"	24"	52'	430	—	5/16"	PE 2000-886 Addendum A
F017 (Cathedral)	Foamseal F2100		13' 8"	24"	36'	324	—	5/16", 3/8, 1/2", 5/8"	NAHB Hud Contract HC-14362
F023	Foamseal F2100	—	13' 9"	24"	44'	392	—	5/16", 3/8, 1/2", 5/8"	UL Project 89NK5259 (Application M)
F026	Foamseal F2100	—	15' 5"	24"	44'	430	—	5/16", 3/8, 1/2", 5/8"	UL Project 89NK5259 (Application L)
F029	Foamseal F2100	—	15' 6"	24"	48'	462	—	5/16"	PE 93-1070
F032 (Cathedral)	Foamseal F2100		15' 6"	24"	48'	382	—	5/16"	PE 93-1072
F033 (Cathedral)	Alphaseal 5200		11' 9"	24"	48'	569	—	5/16"	PEI 1998-1028 Addendum A
F034 (Cathedral)	Alphaseal 5200		11' 8"	24"	48'	535	—	1/2" LITE	EI 1998-1028 Addendum K
F035 (Cathedral)	Dow Voramer		11' 8"	24"	52'	694	—	5/16"	PEI 2001-1505 Addendum A
F036 (Cathedral)	Dow Voramer		11' 8"	24"	52'	562	—	1/2" LITE	PEI 2001-1505 Addendum H

Gold Bond®
Technical Data

Gold Bond® HUD Gypsum Board

Physical Properties	1/2" Gypsum Board
Thickness[1], Nominal	1/2" (12.7 mm)
Width[1], Nominal	4' (1,219 mm)
Length[1,4], Standard	8' - 16' (2,438 - 4,877 mm)
Weight, Nominal	1.6 lbs. / sq. ft. (7.81 k/m²)
Edges[1]	Tapered
Flexural Strength[1], Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength[1], Parallel	≥ 36 lbf. (160 N)
Humidified Deflection[1]	N/A
Nail Pull Resistance[1]	≥ 77 lbf. (343 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Thermal Resistance[5]	R = .45
Product Standard Compliance	ASTM C 1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility[2]	Non-combustible Core
Surface Burning Characteristics[3]	Class A
Flame Spread[3]	15
Smoke Development[3]	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C	
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*	
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*	
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*	
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.
5. Tested in accordance with ASTM C518.

Gold Bond®
Technical Data (Continued)

Gold Bond® High Strength LITE® Gypsum Board

Physical Properties	High Strength LITE
Thickness[1], Nominal	1/2" (12.7 mm)
Width[1], Nominal	4' (1,219 mm) 54" (1,372 mm)
Length[1,4], Standard	8' - 16' (2,438 - 4,877 mm)
Weight, Nominal	1.3 – 1.4 lbs./sq. ft. (6.35 – 6.84 k/m2)
Edges[1]	Tapered or Square
Flexural Strength[1], Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength[1], Parallel	≥ 36 lbf. (160 N)
Humidified Deflection[1]	≤ 10/8" (31.8 mm)
Nail Pull Resistance[1]	≥ 77 lbf. (343 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Thermal Resistance[5]	R = .45
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility[2]	Non-combustible Core
Surface Burning Characteristics[3]	Class A
Flame Spread[3]	15
Smoke Development[3]	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C	
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*	
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*	
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*	
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.
5. Tested in accordance with ASTM C518.

Gold Bond® Ceiling Board

Physical Properties	Gold Bond Ceiling Board
Thickness[1], Nominal	1/2" (12.7 mm)
Width[1], Nominal	4' (1,219 mm)
Length[1,4], Standard	8' - 16' (2,438 - 4,877 mm)
Weight, Nominal	1.8 lbs./sq. ft. (8.79 k/m2)
Edges[1]	Square or Tapered
Flexural Strength[1], Perpendicular	≥ 107 lbf. (476 N)
Flexural Strength[1], Parallel	≥ 36 lbf. (160 N)
Humidified Deflection[1]	≤ 10/8" (31.8 mm)
Nail Pull Resistance[1]	≥ 77 lbf. (343 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)
Product Standard Compliance	ASTM C 1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility[2]	Non-combustible Core
Surface Burning Characteristics[3]	Class A
Flame Spread[3]	15
Smoke Development[3]	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C	
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*	
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*	
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*	
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.

Gold Bond®
Technical Data (Continued)

Gold Bond® Fire-Shield® Gypsum Board

Physical Properties	1/2" Fire-Shield C	5/8" Fire-Shield X	5/8" Fire-Shield C
Thickness[1], Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width[1], Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)	4' (1,219 mm), 54" (1,372 mm)
Length[1,4], Standard	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	1.9 lbs./sq. ft. (9.28 k/m^2)	2.2 lbs./sq. ft. (10.74 k/m^2)	2.3 lbs./sq. ft. (11.23 k/m^2)
Edges[1]	Square or Tapered	Square or Tapered	Square or Tapered
Flexural Strength[1], Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength[1], Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection[1]	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance[1]	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)	15' (4,572 mm)	15' (4,572 mm)
Thermal Resistance[5]	R = .45	R = .56	R = .56
Product Standard Compliance	ASTM C 1396	ASTM C 1396	ASTM C 1396
Fire-Resistance Characteristics			
Core Type	Type C	Type X	Type C
UL Type Designation	FSW-C	FSW	FSW-C
Combustibility[2]	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics[3]	Class A	Class A	Class A
Flame Spread[3]	15	15	15
Smoke Development[3]	0	0	0
Applicable Standards and References			
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products			
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus			
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board			
ASTM C1396 Standard Specification for Gypsum Board			
ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials			
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials			
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C			
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*			
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*			
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*			
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*			

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.
5. Tested in accordance with ASTM C518.

Gold Bond® High Flex® Gypsum Board

Physical Properties	High Flex
Thickness[1], Nominal	1/4" (6.4 mm)
Width[1], Nominal	4' (1,219 mm)
Length[1,4], Standard	8' (2,438 mm)
Weight, Nominal	0.95 lbs./sq. ft. (4.64 k/m2)
Edges[1]	Slightly Tapered
Flexural Strength[1], Perpendicular	≥ 46 lbf. (205 N)
Flexural Strength[1], Parallel	≥ 16 lbf. (71 N)
Humidified Deflection[1]	N/A
Nail Pull Resistance[1]	≥ 36 lbf. (160 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)
Bending Radius	Refer to Gold Bond High Flex Submittal Sheet
Thermal Resistance[5]	N/A
Product Standard Compliance	ASTM C1396
Fire-Resistance Characteristics	
Core Type	Regular
UL Type Designation	N/A
Combustibility[2]	Non-combustible Core
Surface Burning Characteristics[3]	Class A
Flame Spread[3]	15
Smoke Development[3]	0
Applicable Standards and References	
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products	
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board	
ASTM C1396 Standard Specification for Gypsum Board	
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials	
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C	
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*	
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*	
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*	
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*	

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.
5. Tested in accordance with ASTM C518.

Gold Bond®
Technical Data (Continued)

Gold Bond® XP® Gypsum Board

Physical Properties	1/2" XP	1/2" XP Fire-Shield C	5/8" XP Fire-Shield	5/8" XP Fire-Shield C
Thickness[1], Nominal	1/2" (12.7 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width[1], Nominal	4' (1,219 mm) 54" (1,372 mm)	4' (1,219 mm)	4' (1,219 mm) 54" (1,372 mm)	4' (1,219 mm)
Length[1,4], Standard	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)	8' – 12' (2,438 mm – 3,658 mm)
Weight, Nominal	1.5-1.6 lbs./sq. ft. (7.32-7.81 k/m^2)	1.9 lbs./sq. ft. (9.28 k/m^2)	2.2 lbs./sq. ft. (10.74 k/m^2)	2.3 lbs./sq. ft. (11.23 k/m^2)
Edges[1]	Tapered or Square	Tapered or Square	Tapered or Square	Tapered or Square
Flexural Strength[1], Perpendicular	≥ 107 lbf. (476 N)	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength[1], Parallel	≥ 36 lbf. (160 N)	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection[1]	≤ 10/8" (31.8 mm)	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance[1]	≥ 77 lbf. (343 N)	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness[1] – Core, Edges and Ends	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)	≥ 11 lbf. (49 N)
Bending Radius	10' (3,048 mm)	10' (3,048 mm)	15' (4,572 mm)	15' (4,572 mm)
Thermal Resistance[5]	R = .45	R = .45	R = .56	R = .56
Permeance[6]	37 perms	37 perms	37 perms	37 perms
Water Absorption1 (% of Weight)	≤ 5%	≤ 5%	≤ 5%	≤ 5%
Mold Resistance6, ASTM D3273	Score of 10	Score of 10	Score of 10	Score of 10
Mold Resistance8, ASTM G21	Score of 0	Score of 0	Score of 0	Score of 0
Product Standard Compliance	ASTM C 1396	ASTM C 1396	ASTM C 1396	ASTM C 1396
Fire-Resistance Characteristics				
Core Type	Regular	Type C	Type X	Type C
UL Type Designation	N/A	FSW-C	FSW	FSW-C
Combustibility[2]	Non-combustible Core	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics[3]	Class A	Class A	Class A	Class A
Flame Spread[3]	15	15	15	15
Smoke Development[3]	0	0	0	0
Applicable Standards and References				
ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products				
ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus				
ASTM C840 Standard Specification for Application and Finishing of Gypsum Board				
ASTM C1396 Standard Specification for Gypsum Board				
ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials				
ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials				
ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750˚C				
Gypsum Association, GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*				
Gypsum Association, GA-216, *Application and Finishing of Gypsum Panel Products*				
Gypsum Association, GA-238, *Guidelines for Prevention of Mold Growth on Gypsum Board*				
Gold Bond Building Products, LLC Manufacturer Standards, *NGC Construction Guide*				

1. Specified values per ASTM C1396, tested in accordance with ASTM C473.
2. Tested in accordance with ASTM E136.
3. Tested in accordance with ASTM E84.
4. Please consult your local sales representative for all non-standard lengths and widths. Minimum order requirements may apply.
5. Tested in accordance with ASTM C518.
6. Tested in accordance with ASTM E96.
7. Tested in accordance with ASTM D3273 and rated in accordance with ASTM D3274.
8. Tested in accordance with ASTM G21.

Gold Bond®
Installation Guide

Gypsum Board Installation

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840, GA-216 and other approved methods.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX® fastener pattern provides quick identification and uniform nail/ screw patterns. Use GridMarX to make accurate cuts without drawing lines. GridMarX guide marks run the length of the board at five points in 4" (102 mm) increments. Marks run along the edge in both tapers and at 16" (406 mm), 24" (610 mm) and 32" (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Cut gypsum board to allow for a minimum 1/4" (6.4 mm) gap between gypsum board and floor to prevent potential wicking
- Locate gypsum board joints at openings so that no joint will occur within 12" (305 mm) of the edges of the opening unless installing control joints at these locations. Stagger vertical end joints. Joints on opposite sides of a partition should not occur on the same stud.
- Hold gypsum board in firm contact with the framing member while driving fasteners. Fastening should proceed from center portion of the board toward the edges and ends. Set fasteners with heads slightly below the surface of the board. Take care to avoid breaking the face paper of the gypsum board. Remove improperly driven nails or screws.
- Maintain a room temperature of not less than 40°F (4°C) during application of gypsum board.
- Maintain a room temperature of not less than 50°F (10°C) when using adhesive to attach the gypsum board and during joint treatment, texturing and decoration, beginning 48 hours prior to application and continuously thereafter until completely dry. Maintain adequate ventilation in the working area during installation and curing period.
- Double nailing is an alternate method of attachment devised to minimize nail pops. This system requires doubling up on the field nails. The total quantity of nails used does not double, however, since maximum nail spacing is increased to 12" (305 mm) o.c. and conventional nailing is used on the perimeter. Application is accomplished by first single nailing the field of the board, starting at the center and working toward ends and edges. Another nail is then driven in close proximity (2" [50.8 mm] to 2-1/2" [63.6 mm]) to each of the first nails. The first series of nails are then struck again to ensure the board is drawn tightly to the framing member.
- When using adhesive to attach gypsum board, apply drywall adhesive to the face of studs or joists in continuous beads. Reference ASTM C840 Section 10.

Gold Bond®
Installation Guide (Continued)

CURVED SURFACES

To apply gypsum board over a curved surface, place a stop at one end of the board and then gently and gradually push on the other end, forcing the center against the framing until the curve is complete. Shorter radii than shown in the accompanying table may be obtained by moistening the face and back papers of the board with water and allowing the water to soak into the core. When the board is dry, it will regain its original hardness.

Apply gypsum board to curved surfaces in accordance with the Gypsum Board Bending Radii chart below.

To achieve tighter bending radii, use Gold Bond® High Flex®.

GYPSUM BOARD BENDING RADII

Gypsum Panel	Bending Lengthwise	Bending Widthwise
1/4" (6.4 mm)	5'0" (1,524 mm)	15'0" (4,572 mm)
3/8" (9.5 mm)	6" (2,286 mm)	25'0" (7,620 mm)
1/2" (12.7 mm)	10'0" (3,048 mm)	–

FINISHING

Refer to GA-214, *Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels*, to determine the level of finishing needed to assure a surface properly prepared to accept the desired decoration.

DECORATION

Ensure gypsum board surfaces, including finished joints, are clean, dust-free and gloss-free to achieve best painting results. Apply a coat of a quality gypsum board primer to equalize the porosities between surface paper and joint compound, improving fastener and joint concealment. Selection of a paint to provide desired finish characteristics is the responsibility of the architect or contractor. Prepare and prime gypsum boards prior to texturing. Refer to GA-214 to determine the level of finishing needed to ensure a surface properly prepared to accept the desired decoration.

CRITICAL LIGHTING AREAS

Wall and ceiling areas abutting window mullions or skylights, long hallways, and atriums with large surface areas washed with artificial or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal minor surface imperfections. Light striking the surface obliquely, at a slight angle, exaggerates surface irregularities. If you cannot avoid critical lighting, minimize the effects by skim coating the gypsum board surfaces, by decorating the surface with medium to heavy textures, or by the use of draperies and blinds, which soften shadows. In general, paints with sheen levels other than flat, enamel paints and dark-toned paint finishes highlight surface defects; consider the use of textures to hide these minor visual imperfections.

LIMITATIONS

- Avoid exposure to excessive or continuous moisture and extreme temperatures. Do not expose gypsum board to temperatures exceeding 125° F (52° C) for extended periods of time.
- Properly ventilate or condition attic spaces to remove moisture buildup above gypsum board ceilings. If required, a vapor retarder may be installed in exterior ceilings behind gypsum board.
- Avoid installing gypsum board directly over insulation blankets with facer flanges placed continuously across the face of the framing members; recess insulation blankets and attach flanges to the sides of framing.
- Isolate gypsum board from contact with building structure in locations where structural movement may impose direct loads on gypsum board assemblies.
- Provide control joints spaced not more than 30 ft. (9,144 mm) where employing long continuous runs of walls, partitions or ceilings without perimeter relief.
- Avoid gypsum board joints within 12" (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Apply 1/4" (6.4 mm) gypsum board only to existing surfaces and do not apply directly to framing members, except when used with other thicknesses in double-layer systems tested for specific purposes. Existing walls and ceilings should be sound, flat, level and without void spaces. Apply 1/4" (6.4 mm) thick gypsum board with a combination of nails or screws and adhesive that will bond to the substrate surface covering. Framing spacing should not exceed 24" (610 mm) o.c. Apply adhesive to the substrate between framing members to bond the gypsum board.
- All ends and edges of gypsum board should occur over framing members or other solid backing except where treated joints occur at right angles to framing or furring members.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid unsupported insulation should not exceed the recommendations provided in the Ceiling-Supported Insulation chart.

CEILING-SUPPORTED INSULATION

	Regular	Regular	Regular	Celing Board
Thickness, Nominal	3/8" (9.5 mm)	1/2" (12.7 mm)	1/2" (12.7 mm)	1/2" (12.7 mm)
Framing Spacing	16" (406 mm) o.c.	16" (406 mm) o.c.	24" (610 mm) o.c.	24" (610 mm) o.c.
Weight of Ceiling -Supported Insulation	Non Allowed	2.2 psf (10.7 kg/m²)	1.6 psf (7.8 kg/m²)	2.2 psf (10.7 kg/m²)

Gold Bond® Seaspray Hi-Strength MVR® Ceiling Panels

GENERAL

Note: If blown-in cellulose insulation is used, take care to follow insulation manufacturer's specifications on addition of water. Excess moisture in this insulation can cause Seaspray Hi-Strength MVR to sag.

Foam Method: Make sure trusses are 24" o.c. or less. After ceiling trusses are placed on gypsum board, apply foam adhesive per the manufacturer's instructions. For a finished look, use either a vinyl spline or a flat wood batten over board joints.

Staple Method: Make sure trusses are 24" o.c. or less. Staples are spaced 4" o.c. around the perimeter with the crown 1/4" from and parallel to board edge. Rosette placement should not exceed 24" o.c. in the field of the board. No vapor barrier is needed with Seaspray Hi-Strength MVR Ceiling Panels. Staple panel ends to the sideboards (rails). Lay out rafters (trusses) and nail sideboards to them. Then, staple panel edges to the framing. Staples must be driven flush with the Seaspray Hi-Strength MVR Ceiling Panel surface – either parallel or perpendicular (stitched) to adjoining edges. Drive screws through rosettes into the framing member. Be careful not to overdrive screws as it could result in stripped threads or broken board.

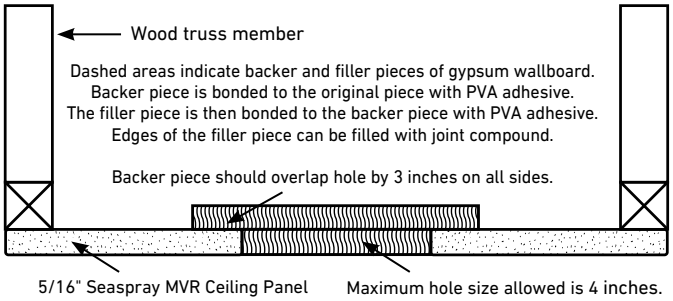
For specific applications and shear values, please refer to section titled "Shear Tests."

Note: Figure 1. (below) illustrates how to repair small holes in Seaspray Hi-Strength MVR Panels. Seaspray Hi-Strength MVR Ceiling Panels, like any other prefinished product, can be scuffed or damaged during handling and installation. Most touch-ups can be avoided with close supervision and constant focus on minimizing damage through correct handling and installation.

In-Plant Procedures To Reduce Damage To Seaspray Hi-Strength MVR Ceiling Panels:

- Use forklift extenders to unload trucks and move Seaspray units into the plant.
- Do not drag one board over another or down the ceiling jig.
- Do not drop one board over another unless both are aligned like pages in a book.
- Care must be taken by plant personnel while bringing items into the home.

FIGURE 1.



Patch in Seaspray ceiling assembly when back of ceiling is accessible.

Maximum size of hole to be repaired cannot exceed 4" in diameter. Backing material can be wood or gypsum. It is there to provide a backer to fasten the patch.

Where Seaspray MVR Touch-Up is Needed:

- There are two types of Seaspray MVR Touch-Up paint available: aggregate and non-aggregate. Each is tinted to match the board produced at that particular manufacturing plant.
- For best results, keep paint and board manufacturing dates within three months of each other. Stir the touch-up paint thoroughly before use.
- Before use of either paint, look at the damage and decide which paint would work best. If only a small scratch is involved, the non-aggregate paint will work well. If major scrapes or damage is involved, the aggregate paint is normally needed. With textured paint, the foam covered roller (such as Hyde Tools part #30430) or a small brush will apply the paint satisfactorily.
- Best results are achieved by covering only the damaged area. Do not repaint major areas of the panel unless necessary. For very small scratches, use the corner of the foam roller or a small artist's paintbrush. For larger areas, use only as much paint as is needed. If care is taken to only touch-up the affected area, normally it is not necessary to scrape off additional texture around the damaged area. If all texture is gone from an area, two or possibly three light coats will produce the best results. Do not try to apply one heavy coat, as this will be readily visible after drying.

REPAIR PROCEDURES

Minor Cracks With No Texture Loss: Using a small brush and brushing perpendicular to the crack, force the coating into the opening. Dabbing the coating with a fingertip is an acceptable alternative.

Minor Scratches With Minimal Texture Loss: Lightly dab the coating on the scratch with a small brush.

Major Cracks Aligned To The Linear Texture: Scrape off a nominal 1" wide path of the texture the length of the crack. Fill the crack with a setting compound or a putty-type caulking compound. Allow to dry. Loose board at the crack may require backing up and refastening to a framing member. Reapply the texture as needed with Seaspray MVR Touch-Up and roller.

Major Cracks Perpendicular To The Linear Texture: Same as above. You may use a brush if texture loss is not very wide.

Major Texture Loss/Paper And Core Not Damaged: Reapply the texture to the damaged area using the rubber roller. Roll out the coating in the machine direction to align the new texture in the same direction as the original.

Major Panel Damage/Surface Paper Torn, Exposed Gypsum Core, Holes Through Entire Panel: Fill the area with a setting type compound and smooth the surface with a putty knife. Scrape the texture off the panel in the area immediately around the defect. Allow to set before topcoating with Seaspray MVR Touch-Up paint. Use a roller or a brush as needed. An alternate method is to fill with caulking compound. Allow to dry before coating.

Note: Very deep gouges or holes may require multiple coats of filler to reduce shrinkage or cracking. Allow to dry between coats.

Clean Up: Tools may be cleaned with ordinary tap water. Use a mild soap solution to clean hands, brushes and rollers.

Problems and Solutions

GYPSUM BOARD PROBLEMS

CONDITION	PROBABLE CAUSE	PREVENTATIVE ACTION	CORRECTIVE ACTION
Wavy board	Improper storage/slow stock rotation (less than 3 months).	Be sure gypsum board is stored indoors, and kept dry. Risers must be spaced properly, and be vertically aligned.	If using foam adhesive application, store the gypsum on a flat surface, possibly on long length wood pallets. Keep on this surface for several days prior to using. If a mechanical attachment is used, simply decrease fastener spacing to "pull" gypsum to rafters, thereby flattening gypsum board.
Uneven joints	Debris on the ceiling jig. Unlevel ceiling jig. Wavy board.	Keep ceiling jig clean and free of debris. Re-level and resurface as needed.	Store board properly. Tape joints on the back side to minimize foam adhesive leaking through to the ceiling jig.
Foam adhesive leakage between gypsum boards	Warped rafters, or rafters with excess camber. Unlevel or unclean ceiling jig.	Apply 3/4" masking tape over joints on back side of board prior to laying rafters on them. "Stitch stapling" of joints on back side helps to keep boards in position while rafters are positioned. Check rafters regularly – bottom chords should be flat and straight, with the least camber possible.	Clean leakage off front of board, taking extra care not to damage paint/texture finish when using Seaspray MVR.
Wet board	Poor storage area that is not protected from weather.	Store gypsum board in covered, dry area.	Gypsum board may be used if it is only damp, and is allowed to dry completely. If board exhibits any of the following qualities, do not use it: board is wet with stains on face; mildew is present; gypsum core is separating from paper.
Gypsum core fracture	Rough handling. Dropped board on its edge, or dropping one board across another.	Do not allow board to be dropped on ceiling jig. Lay out panels with care. Avoid walking on back of board while on ceiling jig unless jig has a solid, flat surface.	Cracks less than 12" in length can be finished with joint compound. Small Seaspray Hi-Strength MVR cracks can be filled with DAP tub and tile caulk and covered with touch-up paint. Cracks greater than 12" in board should result in board replacement.
Cracks in field of board created during ceiling movement in plant	Ceiling hoists not picking up tops uniformly. Inadequate support of top. Excess flexing due to lightweight side or edge rail. Inadequate or incorrectly positioned splice blocks.	Provide an adequate number of pick-up points in the hoist. Synchronize hoist motors. Use 2"x3" or 2"x4" instead of 1"x3" or 1"x4" for side or edge rail. Splice blocks should not be positioned at the same place on opposite sides of the top, or at the transition areas between vaulted and flat ceilings.	Small cracks (less than 12" in length) can be finished with joint compound. Small Seaspray Hi-Strength MVR cracks can be filled with DAP tub and tile caulk and covered with touch-up paint. Large cracks (greater than 12") in board should result in board replacement.

GYPSUM BOARD (CONTINUED)

CONDITION	PROBABLE CAUSE	PREVENTATIVE ACTION	CORRECTIVE ACTION
Seaspray texture "skips" (no paint/texture in areas of the board)	Manufacturing defect.	Immediately notify National Gypsum, or its distributor. It will be necessary to communicate the manufacturing code (on the back of the board), and save a sample showing the problem.	If ceiling is already up, use touch-up paint on all spots. If areas requiring touch-up are excessive, it may be necessary to paint entire ceiling. If problem is noticed prior to laying board on jig, do not use.
Seaspray texture appears "scuffed" or nonexistenet on areas of board (board is totally covered with paint, but texture is not evident in areas)	Rough handling of board. Dragging face of Seaspray Hi-Strength MVR across ceiling jig.	Handle board carefully when laying out on ceiling jig.	Use Seaspray MVR touch-up paint on affected areas.
Seaspray touch-up paint not matching board finish	Old touch-up inventory. Paint is not properly mixed.	Turn inventory – if paint is older than 3 months, it should not be sold. Prior to use, shake and stir paint thoroughly to mix pigment.	Mix paint thoroughly. If it does not match, contact local distributor or National Gypsum immediately for fresh paint.
Sag	Failure to prime prior to texturing allowing board to absorb excess moisture. Excess insulation weight. Condensation in roof cavity.	Prime ceiling prior to texturing. Use a HUD-approved vapor barrier. Support insulation weight independent of gypsum. Use framing 16" o.c., or 1/2" Ceiling Board where 24" o.c. rafter spacing is desired.	Replace ceiling board and employ preventive actions.
Sag	The addition of excessive water to blown-in cellulose insulation.	Care must be taken to follow the insulation manufacturer's specifications on addition of water.	Replace ceiling board and employ preventive actions.

NAIL PROBLEMS

CONDITION	PROBABLE CAUSE	PREVENTATIVE ACTION	CORRECTIVE ACTION
Nail Pops	Framing out of alignment. Lumber shrinkage. Improper gypsum board application. Improper heating and ventilation.	Provide heat and ventilation to dry framing lumber. Align framing lumber. Nail center of gypsum board first. Hold gypsum board firm to nailing member when nailing. Use proper nails. Check all nails before nail spotting. Systems recommended to reduce or eliminate nail pops include: double-layer lamination, double nailing system, floating angle system, adhesive nail-on system and screw application.	When nail pops occur before decoration, repair immediately. If problem occurs after decoration, repair after framing lumber is dry (usually one heating cycle). To repair, drive a GWB-54 nail 1-1/2" from each side of popped nail while holding gypsum board firm to the nailing member. Countersink popped nail, remove loose joint compound, then apply finishing coats of joint or topping compound.
Depressed Nails	Framing out of alignment. Lumber expansion due to moisture absorption. Improper gypsum board application. Too few nails, improper furring, structural movement. Nails dimpled too deeply.	Align framing lumber. Allow dry lumber to become acclimated. Correct gypsum board application as described for nail pops. Use proper nail spacing. When furring, use no less than 2x2. Use systems recommended to reduce or eliminate nail pops. Avoid fracturing paper when driving nails.	Repair as described for nail pops, unless most nails are depressed and gypsum board is loose (usually ceilings). Re-nail entire surface using proper spacing. Dimple depressed nails and apply finishing coats of joint or topping compound.

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The 1-800 Construction Services Team (left to right): Mark Chapman, Jim Farrell and Sam Halverson.

Notes

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MOLD AND MILDEW RESISTANCE

XP products were designed to provide extra protection against mold and mildew. When tested by an independent laboratory, XP products received the highest possible ratings on ASTM G 21 and D 3273. The use of XP products in actual installations may not produce the same results as were achieved in controlled laboratory conditions.

No material can be considered "mold-proof," nor is it certain that any material will resist mold or mildew indefinitely. When used in conjunction with good design, handling and construction practices, XP products can provide increased mold resistance. As with any building material, avoiding water exposure during handling, storage and installation, and after installation is complete, is the best way to avoid the formation of mold or mildew.

Technical Information

Visit nationalgypsum.com or call 1-800-NATIONAL (628-4662).

Technical Information *Información Técnica*
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National Gypsum Company is the exclusive service provider for products manufactured by Gold Bond Building Products, LLC, ProForm Finishing Products, LLC and PermaBASE Building Products LLC.

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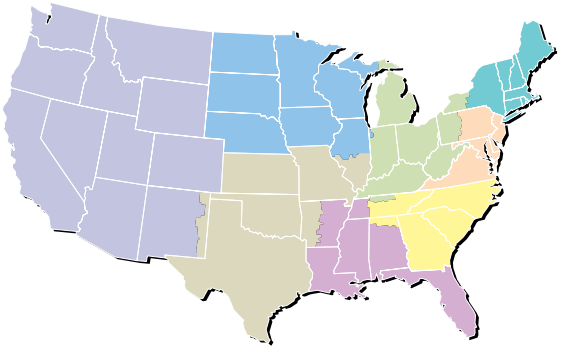

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