
DensArmor Plus[®] High-Performance Interior Panels Wallworks Guide

Planning, Applying, Installing, Finishing
and Repairing Your Walls and Ceilings.

Plan

1. Sketch

A little planning before the job begins can save you a lot of time and materials later on.

- Sketch out the area you want to cover with DensArmor Plus® High-Performance panels. Use the sketch as a guide to determine how much drywall you'll need.
- Remember to plan for the board to be installed across (perpendicular to) joists and/or studs.
- Try to avoid end joints wherever possible. To do that, you may want to buy 12' instead of 8' board, depending on your room size.
- If end joints can't be avoided, stagger them so they all don't fall at one end of the room.

Your DensArmor Plus panels should be stored flat, indoors, away from moisture and temperature extremes, until you're ready to use it. As soon as possible after joint treatment is thoroughly dry, all surfaces should be sealed or primed.

2. Estimate

Once you've determined how much DensArmor Plus panels you'll need, you can use the charts on the next page to estimate for nails, joint compound and tape.

Note: If you're applying drywall to masonry walls, see "Masonry" section for additional materials.

How Much Board Do You Need?

First, figure out the wall and ceiling areas.

Width of the room x Length of the room = Ceiling area
 (Width + Length) x 2 x Height of the room = Wall area

For example, a 12' x 16' x 8' room has a wall/ceiling area of 640 sq. ft. (Ceiling area: 12 x 16 = 192;

Wall area: (12 + 16) x 2 x 8 = 448; 192 + 448 = 640.)

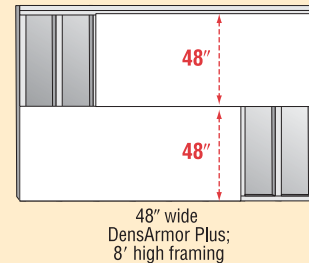
Look at the Room Measurement Table for a quick reference. Measure door and windows area and subtract their square footage from the total square footage to obtain net room area. Then refer to the Panel Coverage Table to locate the number of wallboard panels required for the room. Be sure to allow 10% to 15% overage for cutting and piecing.

Room Measurement Table

	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
8'	224	248	272	296	320	334	368	392	416	440	464	488	512
9'	244	269	294	319	344	369	394	419	444	469	494	519	544
10'	264	290	316	342	368	394	420	446	472	498	524	550	576
11'	284	311	338	365	392	419	446	473	500	527	554	581	608
12'	304	332	360	388	416	444	472	500	528	556	584	612	640
13'	324	353	382	411	440	469	498	527	556	585	614	643	672
14'	344	374	404	434	464	494	524	554	584	614	644	674	704
15'	364	395	426	457	488	519	550	581	612	643	674	705	736
16'	384	416	448	480	512	544	576	608	640	672	704	736	768

Panel Coverage Table (in sq. ft. of wall area)

	1 Panel	2 Panels	3 Panels	4 Panels	5 Panels	6 Panels
4' x 8' Panel	32	64	96	128	160	192
4' x 9' Panel	36	72	108	144	180	216
4' x 10' Panel	40	80	120	160	200	240
4' x 12' Panel	48	96	144	192	240	288
4' x 14' Panel	56	112	168	224	280	336
4' x 16' Panel	64	128	192	256	320	384



Estimating Drywall Nails

Joist/Stud width (on center)	DensArmor Plus® Thickness	Drywall Nails	Approx. lbs. of nails per 1000 sq. ft. of drywall
16"	½"	1½" coated	5¼ lbs.
24"	⅝"	1½" coated	5¼ lbs.

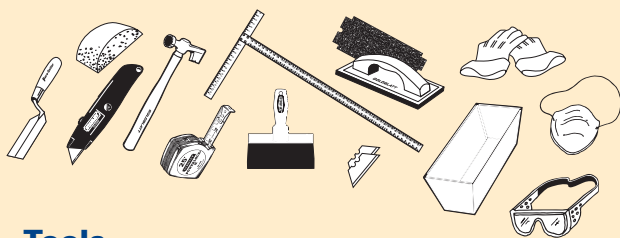
Estimating Joint Compound and Tape

DensArmor Plus Panel Sq. Ft.	All-Purpose Joint Compound	Estimated Amount of ToughRock® Tape
100-200 sq. ft.	12 lb. Pail	two 60' rolls
500 sq. ft.	48 lb. Ctn.	one 250' roll
800 sq. ft.	61.7 lb. Pail	two 250' rolls

Plan/Apply

Materials

- DensArmor Plus® Interior Panels (Use our online calculator to estimate the number of pieces you'll need for your project at www.densarmorplus.com and click on "Installation".)
- Fasteners
- Cornerbeads (if needed)
- Joint Compound
- Paper or fiberglass tape for the joints
- Primer and paint or other wall covering

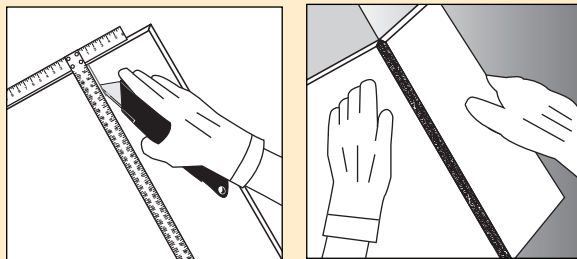


Tools

The basic tools you'll need are:

1. Drywall knife with heavy-duty blade
2. Drywall hammer or regular crown-headed carpenter's claw hammer
3. 4' T-square or steel straightedge
4. Steel tape measure
5. Keyhole or utility saw
6. Joint finishing knives — 5" and 10" blades
7. Plastic pan for joint compound
8. Sandpaper, medium texture (80 to 100 grit) and sanding block for joint finishing
9. Damp sponge
10. Pencil
11. Safety glasses
12. Dust mask
13. Protective gloves

Follow these standard work practices: Wear a loose-fitting, long-sleeved shirt and long pants, protective gloves and eye protection (goggles or safety glasses with side shields). Wear a dust mask when sanding. Additional protection may be needed when very dusty. Do not use a power saw.



Cut

Using your T-square or straightedge and drywall knife, score the gypsum panel completely through the facer. Then use firm, even pressure to snap the board along the cut. Fold back the board, and use the knife to cut the back facer. Smooth rough edges.

Receptacle Openings, Etc.

Carefully measure openings for receptacles, switches, etc. from the edge and end of the board, and mark guidelines on the face. Use a keyhole saw to cut the openings. Make sure your measurements and cuts are accurate, or the cover plate you install later on will not conceal the hole.

CAUTION: When working with tools, always wear approved safety glasses.

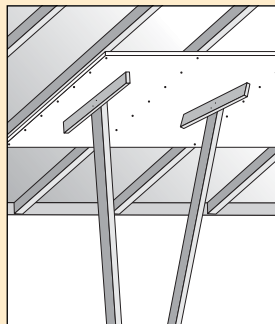
Installation

Installation

DensArmor Plus® panels are installed in a similar manner to traditional paper-faced drywall. DensArmor Plus panels should be installed according to the most current versions of Gypsum Association Publication GA-216-2007–“Application and Finishing of Gypsum Panel Products” and ASTM C 840–“Standard Specification for Application and Finishing of Gypsum Board for Non-Fire Rated Construction.” For best results, abut DensArmor Plus panels against regular paper-faced wallboard only at inside or outside corners to eliminate transitions in the field of a wall or ceiling. Adjust fastening tools to insure that the fasteners are not over-driven through the face of the board. Nails and screws should be driven with the heads slightly below the surface of the panel.

Ceilings

For ceilings, always use nails or screws (mechanical attachment). Nails should be spaced at 7” intervals



and screws at 12” intervals, around the edges (about $\frac{3}{8}$ ” from the edge), and through the center of the boards. Make sure you hit the center of the ceiling joists. For joists that are 16” o.c., $\frac{1}{2}$ ” or $\frac{5}{8}$ ” DensArmor Plus panels may be applied. $\frac{1}{2}$ ” DensArmor Plus may be applied to 24” o.c. joists as

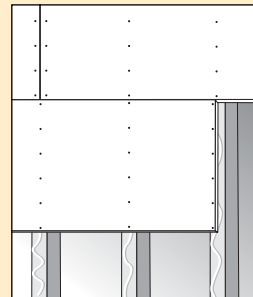
long as it is installed across or perpendicular to ceiling joists as shown.

All nails should be “dimpled”. That is, drive the nails firm enough to indent the board’s facer without tearing it. It’s best to install board on the ceiling before installing board on the wall.

It also helps to have a pair of T-braces to help hold the board in place while it’s being nailed. A good T-brace can be made by nailing a 2’ piece of 1 x 4 onto the end of a 2 x 4. Install boards across (perpendicular to) ceiling joists.

Walls

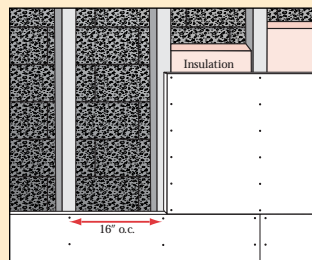
Nail the board around the edges (about $\frac{3}{8}$ ” from the edge), and along each end. Space fasteners at 8” intervals at the ends, edges and field of the panel. Fasteners should be driven so that the heads are slightly below the surface.



Many professionals prefer screws to nails for their extremely strong holding power. For screw application, use only drywall screws. Install boards horizontally or vertically, running across the wall studs.

Masonry

If you’re installing gypsum board on a masonry wall, first cut 1 x 2 or 2 x 2 furring strips to reach from the floor to the ceiling. (2 x 2 strips are good if you plan



to back your drywall with insulation.) Cut enough strips to go around the room when nailed vertically on 16” centers. Nail the strips on the walls, 16” o.c., using masonry nails. (Check with your

home supply dealer for the proper nails for your kind of masonry wall.) When the furring strips are up, rigid foamboard insulation and fiberglass insulation can be cut and placed between strips. Then treat the furring as you would ordinary wall studs, using the application methods described in the “Walls” section on the previous page.

Cornerbead

To protect outside corners from edge damage, install cornerbeads after you’ve installed the drywall. Nail the cornerbead every 5” through the gypsum board, into the wood framing.

Finishing

The finishing and sanding of DensArmor Plus® panels should be performed in accordance with the most current version of Gypsum Association Publication GA-214-07 “Recommended Levels of Gypsum Board Finish.” DensArmor Plus panels may be finished with either paper tape embedded with all purpose joint compound or with fiberglass mesh tape and setting compound. Because of the enhanced properties of DensArmor Plus Interior Panels, drying times for the joint and setting compounds may vary slightly. It is essential to allow each coat of compound to dry thoroughly before applying additional coats of compound. Care should be taken to ensure that all joints and fasteners are properly and adequately sanded to provide a smooth transition between the compound and the face of the board.

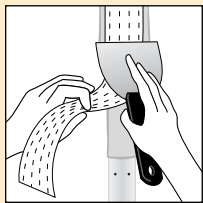
Option 1—Paper Tape

Joints

Finish the joints in four steps. First, apply a coat of joint compound to the joints. Then, immediately embed ToughRock® tape in the joint compound, smooth out bubbles and allow to dry. Next, apply two successive finish coats over the tape and allow to dry between coats. Sand when dry.

Bedding

With your 5" joint finishing knife, apply a smooth, full, even coat of joint compound into the recess created by the tapered edges of adjoining boards.



Center a strip of ToughRock tape over the joint, and press it firmly into the wet bedding compound with your drywall knife at a 45° angle. Press hard enough to squeeze a little compound out from the edge of the tape, but leave enough compound for a good bond. Let dry about 24 hours.

Taping and Finishing

When the taped bedding coat is dry, apply your first finish coat of ToughRock® Ready-Mix All-Purpose Joint Compound. Extend this coat a few inches beyond the tape, and feather the edges. Let dry about 24 hours. Then apply a second finish coat with your 10" joint

finishing knife. Extend this coat 1½" wider than the first finish coat. Wait 24 hours, and sand lightly with your sanding block and medium grit sandpaper. **Don't sand down to the tape.** Wipe off dust with a damp sponge.

Option 2—Fiberglass Tape

To further reduce the potential for mold growth and maintain a completely non paper-faced wall surface, fiberglass joint tape should be used to finish the joints of DensArmor Plus panels. A setting-type compound is required for at least the first coat over fiberglass mesh tape. Additional coats prescribed by the desired level of finish should be a drying-type (powder or ready-mixed) joint compound. Inside corners may be finished with vinyl corner beads to maintain a non paper-faced wall.

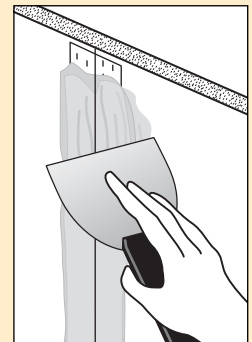
For either tape option, continue with installation

Fastener Heads

Draw your 5" joint finishing knife across the fastener head to make sure it is below the surface of the board. Apply your first coat of All-Purpose Joint Compound so that it just fills the nail dimple. Don't use excess pressure when applying, or your knife may scoop compound from the dimple. Let the first coat dry. At least one more coat will be required. A third coat of Joint Compound may be needed. Sand lightly after each coat dries.

Butt Joints

Butt joints (square cut edge joints) are finished the same way as regular joints, with one exception. Because butt joints are not tapered, you need to be careful not to allow the joint compound and tape to build up any more than necessary. To reduce the effect of the build-up, feather the edges of your finish coats wider than you would for a regular joint.



Outside Corners

Be sure the metal cornerbead is attached firmly (see “Cornerbead” in previous section). Use your 8” knife to spread All-Purpose Joint Compound about 3”-4” past metal corner. Be sure to cover the metal edges. Let dry 24 hours. Apply second coat with your 10” knife. Feather edges 2”-3” beyond first coat. Sand lightly when dry. A third coat may be needed.

Inside Corners

Cut a strip of drywall tape the length of the corner you’re going to finish. Crease the tape down the center. Use your 5” knife to spread Joint Compound about 1½” on both sides of the corner. With the knife press the tape into the corner. Use enough pressure to squeeze some compound from the edge of the tape, but leave enough compound to form a good bond. Feather the compound 2” from the edge of the tape. Let dry 24 hours, finishing only one side at a time. Let dry, finish other side of corner. Let dry, then sand corner. Be careful not to let the compound build up in the very corner of the tape. **Excess compound in the corner could cause hairline cracks.**

Now you’re ready to prime and paint!

A mock-up or test wall should be used to ensure the proposed decorative finish will produce an acceptable result. Proper installation, finishing and priming are critical. Skipping a step, such as the application of a primer or taking shortcuts, such as not using proper sanding techniques, will negatively impact the quality of the final decorative finish.

Because many factors that are unrelated to the manufacture of the panels can affect the acceptability of the final finish result, Georgia-Pacific Gypsum makes no warranty, express or implied, regarding the finish results to be achieved with DensArmor Plus panels.

The following guidelines for priming DensArmor Plus® Interior Panels have been developed by the Rohm & Hass Paint Quality Institute:

1. A high solids primer with at least 40% volume solids should be used. The primer can best be applied by roller at a higher film thickness in one coat vs. brush or spray applied.
2. For adequate coverage, the primer should be applied to a dry film thickness of 1.7 to 1.8 mils dry to ensure uniform coverage and appearance. The number of coats to achieve the dry film thickness will depend on the primer used. For instance, a primer with lower than 37% volume solids may need two coats for adequate coverage.
3. For best results, apply the high solids primer with a ⅜” nap roller at a natural application rate.
4. It is possible to use a ½” nap roller and apply a thicker coat. However, the roller pattern is more pronounced and some may find it objectionable.
5. To maximize the mold-resistant benefit of DensArmor Plus panels, a 100% acrylic primer with mildecide should be used.

% Volume Solids of Primer	Spread Rate, sq. ft./gal.
37	330-350
40	355-380
43	380-400
47	420-450

Priming and Painting

6. High-quality flat or satin paint should be applied over the primer. Semi-gloss or gloss paints are not recommended.
7. Level 5 finish should be utilized for semi-gloss or gloss-paints, per GA-214.

Primers on the market that provide best finishing results include:

- a. ICI Paints Glidden® Gripper® Interior/Exterior Stain Killer Primers/Sealer GL3210-1200
- b. ICI Paints Prep and Prime® Gripper MultiPurpose Interior/Exterior Water Based Primer Sealer 3210-1200
- c. Pratt and Lambert Paints, SUPRIME® Interior Latex Enamel Undercoater Z1013/F1013.
- d. Do It Best® Interior Latex Wood & Wall Primer
- e. Do It Best® Latex Stainblocker Primer
- f. Sherwin Williams® Builders Solution

Build surfacers that provide best finishing results include:

- a. ICI Paints Prep and Prime Fill & Seal Equalizing Interior Water-Based Primer Sealer 1070-1200
- b. Sherwin Williams® Prep Rite High Build Interior-Latex Primer Surfacer

Wallcoverings

Because of the enhanced properties of DensArmor Plus® panels, drying times for the wallcovering adhesives and primers may vary slightly. Some wallcoverings, such as an unbacked vinyl wallcovering, require a Level 5 finish as detailed in GA-214-07 when applied over DensArmor Plus. Avoid the use of wallcovering material over a Level 4 finish if the material is lightweight, contains a limited pattern, has a gloss finish or any combinations of these elements is present as detailed in GA-214-07. Always follow wallpaper and adhesive manufacturer's installation instructions.

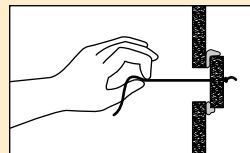
Repair

Tools

The materials and tools you'll need for most repairs are:

1. Setting-type or ToughRock® Ready-Mix All-Purpose Joint Compound
2. Fiberglass mesh tape or drywall tape
3. DensArmor Plus scraps
4. Fasteners (nails or screws)
5. Utility knife
6. 5" and 10" taping knives
7. Hammer
8. Safety glasses

Medium to Small Holes



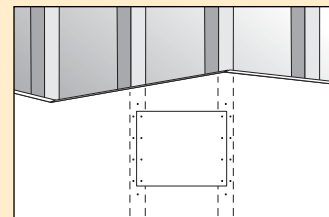
1. Cut out a rectangle around damaged area with knife or keyhole saw.
2. Cut a scrap section of DensArmor Plus, with top and bottom slightly larger than the hole.
3. Place a piece of string through the center of scrap.
4. Apply Joint Compound to edges of scrap, then slide into hole.
5. Center scrap and pull tight until joint compound is set.
6. Cut string, fill hole with joint compound.
7. Additional finish coats may be necessary.

Dents and Gouges

1. Fill with ToughRock Ready-Mix All-Purpose Joint Compound or ToughRock® Sandable Setting Compound.
2. Touch up with paint.

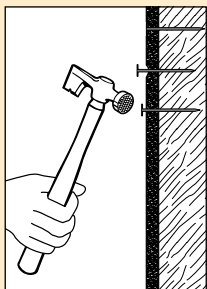
Large Holes

1. To patch larger holes, you may have to cut the gypsum board back to the studs to replace the entire damaged section.
2. Apply ToughRock™ tape and finish off with Joint Compound.



Nail Pops

1. Drive new nail about 1-2" above and below the one that has popped.
2. Push panel close to the stud while you "dimple" the two nails. (See Installation section for explanation of "dimpling.")
3. Remove loose material from dimpled areas, sand lightly.
4. Fill dimpled area with Joint Compound—let dry overnight.
5. If shrinkage occurs in drying, re-apply Joint Compound. When patch is dry, sand lightly.
6. Prime and texture or paint to match existing wall.



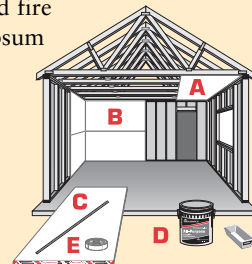
Cracks

For large cracks, use Joint Compound and drywall tape.

1. Sand the area about 6" on each side of the crack.
 2. Work Joint Compound down into crack.
 3. Center tape over the crack and press down firmly with a 5" drywall knife.
 4. Cover tape with a coat of Joint Compound. Smooth it out well beyond tape edges by feathering.
 5. Allow patch to dry overnight. Apply another coat of Joint Compound which extends 1½" wider than the last coat. Smooth edges, let patch dry. Sand lightly.
- Narrow cracks may be filled with Joint Compound alone. Use a stiff brush or screwdriver to remove loose material from the crack.
 - Dampen edges of the crack with water.
 - Fill deep cracks almost to the surface. Let dry, then add a thin coat of Joint Compound. Smooth out 2" on each side of crack, by feathering. Let dry. Sand smooth.

Garage

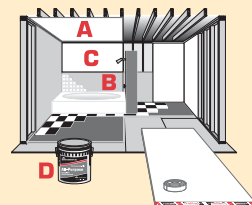
- A** ⅝" DensArmor Plus® Fireguard® Interior Panels, available in 8' to 12' lengths, is used in garage walls and ceilings for improved fire resistance compared to ½" gypsum board.
- B** ½" DensArmor Plus, available in 8' to 12' lengths, is the normal wall and ceiling product for new homes and additions. ⅝" DensArmor Plus Fireguard is preferred for ceilings for improved sag resistance.



- C** Cornerbead in 8' lengths protects outside corners from damage and gives straight and true corners.
- D** Joint Compound and other setting type compounds are available in various sized pails and boxes. Used for taping and finishing gypsum board. Typical usage: 2 (61 lb.) pails or boxes per 1000 square feet of gypsum board.
- E** If a non paper-faced wall surface is desired, fiberglass joint tape should be used. Follow instructions regarding fiberglass joint tape under *Option 2—Fiberglass* in the Finishing Section. Paper joint tape can also be used to tape all joints and interior angles/corners. Typical usage: 350 lineal feet of tape per 1000 square feet of board.

Bathroom

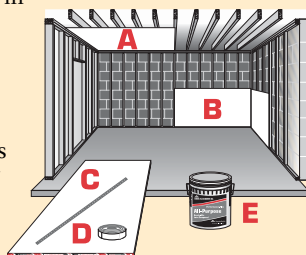
- A** ½" DensArmor Plus Interior Panel is available in 8' to 12' lengths and is the normal wall and ceiling product for new homes and additions.
- B** ¼" and ½" DensShield® Tile Backer from Georgia-Pacific are lightweight, easy to handle substrates that come in various sizes. This heavy-duty tile backer for ceramic tile is used for walls, ceilings, floors and countertops. Features a Lifetime Limited Warranty when used in a residential tile installation. See complete warranty for details at www.densshield.com.



Do It Yourself

C DensArmor Plus panels in 8' lengths are the normal product for bathrooms. DensShield tile backer is recommended for backing tile installations.

D ToughRock® Ready Mix All-Purpose Joint Compound is available in various sized pails and boxes. Used for taping and finishing gypsum board. Typical usage: 2 (61 lb.) pails or boxes per 1000 square feet of gypsum board.



Basement

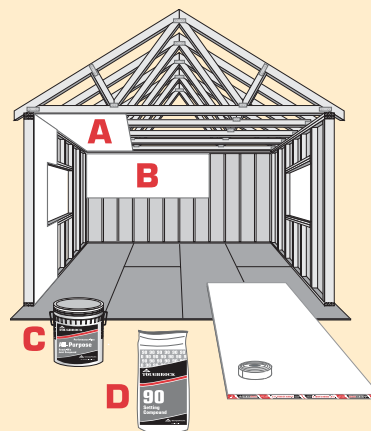
A 1/2" DensArmor Plus, available in 8' to 12' lengths, is the ideal wall and ceiling drywall product for new homes and additions.

B 5/8" DensArmor Plus Fireguard, available in 8' to 12' lengths, is recommended as an alternative to 1/2" gypsum board for improved acoustical isolation and fire resistance compared to 1/2" gypsum board.

C Cornerbead in 8' lengths protects outside corners from damage and gives straight and true corners.

D If a non paper-faced wall surface is desired, fiberglass joint tape should be used. Follow instructions regarding fiberglass joint tape under *Option 2—Fiberglass* in the Finishing Section. Paper joint tape can also be used to tape all joints and interior angles/corners. Typical usage: 350 lineal feet of tape per 1000 square feet of board.

E ToughRock Ready-Mix All-Purpose Joint Compound is available in various sized pails and boxes. Used for taping and finishing gypsum board. Typical usage: 2 (61 lb.) pails per 1000 square feet of gypsum board.**



Addition

A 5/8" DensArmor Plus® Fireguard®, available in 8' to 12' lengths, is the preferred substrate for ceilings and walls for improved fire resistance and sound isolation compared to 1/2" gypsum board.

B 1/2" DensArmor Plus, available in 8' to 12' lengths, is the typical wall and ceiling drywall product for new homes and additions.

C Joint Compound is used for bedding tape, finishing joints, filling cornerbead, spotting nails and texturing. Typical usage: 2 (61 lb.) pails per 1000 square feet for joint taping and finishing and 15-50 lbs. per 1000 square feet when used for texturing.

D ToughRock® Ready-Mix All-Purpose Joint Compound is available in various sized pails and boxes. Used for taping and finishing gypsum board. Typical usage: 2 (61 lb.) pails per 1000 square feet of gypsum board.**

DensArmor Plus® Interior Panels

DensArmor Plus Interior Panels have fiberglass mats instead of paper to provide superior mold resistance. The combination of non paper-faced surfaces and the addition of a moisture-resistant core provides superior moisture and mold resistance when compared to traditional paper-faced drywall.*

ToughRock® Ready-Mix All-Purpose Joint Compound

For finishing joints, nail heads and corners. Also can be used for some texturing, and for most repairs. Comes ready to use in 12 lb., 61.7 lb. pails and 48 lb. cartons.

ToughRock™ Tape

For joint finishing, and major repairs.
75', 250' and 500' rolls.

ToughRock® Sandable Setting Compound

Quick setting joint compounds especially suited for repair work. Mix according to instructions on package. Comes in 18 lb. and 11 kg. bags.

ToughRock® Setting Compounds

Use for all bedding and topcoats. Hardens by setting, not drying. Available 45- and 90-minute. Ideal for patch and repair jobs. Comes in 33 lb. and 15 kg. bags.

HANDLING AND USE

CAUTION: This product contains 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 additional product fire, safety and use information go to www.gp.com/safetyinfo or call 1-800-225-6119.

FIRE SAFETY CAUTION

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.

Please refer to installation recommendations and written warranty. Details available from Georgia-Pacific Gypsum.

**When tested, as manufactured, in accordance with ASTM D 3273.*

*** Recommended drywall taping knives: 4" wide for taping, 6" for the first finish coat, 12" for second finish coat.*