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ICC-ES Evaluation Report

ESR-1140

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
SECTION: 06 05 23.10—ADHESIVES

REPORT HOLDER:

ASHLAND SPECIALTY CHEMICAL COMPANY

**5200 BLAZER PARKWAY
DUBLIN, OHIO 43017**

EVALUATION SUBJECT:

ISOGRIP® ADHESIVES:

SP 2000D SERIES: SP 2020D, SP 2025D, SP 2030D

SP 3000D SERIES: SP 3020D, SP 3030D

SP 4000D SERIES: SP 4010D SP 4020D

SP 5000D SERIES: SP 5000D, SP 5040D, SP 5050D, AND SP 5100D



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Imperial® Gypsum Base, (Firecode® and Firecode® C Core)

IMPERIAL	FIRECODE® CORE Type X	FIRECODE® CORE Type X	USG	<p>A large size, rigid base for fire-rated gypsum veneer plaster systems</p> <ul style="list-style-type: none"> — UL-Listed fire-rated veneer plaster systems. — Special gypsum core and multi-layered laminated face paper to control water absorption, provide maximum plaster bond and resist sag. — Panels are designed for direct or resilient attachment to wood or steel framing. — IMPERIAL® brand bases comply with ASTM C1396/1396M and have gypsum cores UL-Classified as non-combustible per ASTM E136. — 5/8 in Type X with Firecode Core. — 1/2 in and 5/8 improved Type X with Firecode C Core.
IMPERIAL	FIRECODE® C CORE Type X	FIRECODE® C CORE Type X	USG	

Description

IMPERIAL® gypsum base, FIRECODE® and FIRECODE® C cores, are ideally suited for fire-rated veneer plaster systems. Available in a variety of sizes, the panels are large enough to be installed like drywall panels. The distinctive blue face paper is designed to provide the qualities desirable for veneer plaster applications, that is, it controls water absorption, provides for a strong plaster bond and resists plaster slide. The panels provide a rigid base that resists sag. When securely attached, gypsum base adds lateral stability to the assembly. Also, gypsum base partitions faced with veneer plaster on both sides have high resistance to sound transmission. Resilient attachment further improves ratings. These panels are not affected by decay, dry rot or normal moisture; they will not attract vermin.

FIRECODE core IMPERIAL gypsum base is 5/8" thick and provides Type X fire-resistant performance. FIRECODE C core IMPERIAL gypsum base in 1/2" and 5/8" thicknesses provides the highest levels of fire-resistant performance. IMPERIAL gypsum base is designed to be used with the following plaster products: IMPERIAL® veneer finish, DIAMOND® brand veneer finish, USG® Norfolk Special veneer finish, IMPERIAL® veneer basecoat and DIAMOND® veneer basecoat.

- Limitations**
1. IMPERIAL gypsum bases should only be used with veneer plaster products.
 2. IMPERIAL gypsum bases should not be used in areas exposed to excessive moisture for extended periods or as a base for adhesive application of ceramic tile (SHEETROCK® brand MOLD TOUGH® gypsum panels, or DUROCK® brand cement board are recommended for this use).
 3. Do not apply DIAMOND veneer finish, or any lime containing finish plaster, to IMPERIAL gypsum base that has faded from exposure to sunlight. Where fading has occurred, treat surface with either USG™ plaster bonder or a spray-applied solution of USG™ accelerator-alum catalyst before application of finish.
 4. Gypsum base surfaces should be isolated with control joints or other means where: (a) Partition or furring abuts a structural element (except floor) or dissimilar wall or ceiling; (b) Ceiling abuts a structural element, dissimilar wall or partition, or other vertical penetration; (c) Construction changes within the plane of the partition or ceiling; (d) Partitions or furring run exceeds 30'; (e) Ceiling dimensions exceed 30' without relief, or 50' with relief; (f) Expansion or control joints occur in the base exterior wall. Ceiling-height door frames may be used as control joints, as may door frames that are less than ceiling height, if control joints extend to ceiling from both corners.
 5. Do not exceed the maximum spacing of framing members shown in the table below.

Maximum spacing of framing members for new construction:				
		base and finish assembly	framing spacing ⁽¹⁾	
in.	mm		in.	mm
1/2	12.7	IMPERIAL gypsum base one layer, 1-coat system	16	406.4
		one layer, 2-coat system	16 or 24 ⁽²⁾	406.4 or 609.6 ⁽²⁾
		two layer, 1 & 2-coat system	24	609.6
5/8	15.9	IMPERIAL gypsum base one layer, 1-coat system	16 or 24 ⁽²⁾	406.4 or 609.6 ⁽²⁾
		one layer, 2-coat system	24 ⁽²⁾	609.6 ⁽²⁾
		two layer, 1 & 2-coat system	24	609.6

(1) For perpendicular or parallel application to framing. Perpendicular is preferred for maximum strength; parallel application is not recommended for ceilings.
 (2) 24" (609.6 mm) spacing requires joint treatment with SHEETROCK® joint tape and SHEETROCK® setting-type joint compound (DURABOND® or EASY SAND™).



Directions**Preparation**

Protect the product from moisture during storage and on the job. In cold weather, heat the interior of the building to a minimum of 55 °F (13 °C) for an adequate period before the application of plaster, while basecoat and finish is being applied, and until the finish is dry. Air circulation should be kept at a minimum level during this period. **Warning:** Store all IMPERIAL gypsum base flat. Panels are heavy and can fall over, causing serious injury or death. Do not move unless authorized.

Under normal working conditions, joints of veneer plaster systems may be treated by applying IMPERIAL® tape Type P (pressure-sensitive) or Type S (staple) to the joints and then applying the veneer plaster basecoat or finish to preset the tape. However, there are a number of special situations that require the use of a setting-type joint treatment system.

— High building temperature, low humidity or excessive evaporation that creates "rapid drying" conditions.

— Metal framing is specified.

— Certain wood-framing applications with spacing of 24" o.c. (see Maximum Spacing table above).

Under any of these conditions, use SHEETROCK joint tape and SHEETROCK setting-type (DURABOND) or lightweight setting-type (EASY SAND) joint compound to treat all joints and internal angles. Allow the joint treatment to set and dry thoroughly before plaster application. Mist with water prior to initial plaster application.

Installation

IMPERIAL gypsum base may be installed either perpendicular (preferred) or parallel to the framing. All ends and edges should be placed over framing members except where edge joints are perpendicular to framing. Use maximum practical lengths to minimize end joints. Install gypsum base first on ceilings and then on walls. Over steel studs, arrange direction of installation so that the lead edge of the base is attached to the open side of the stud flange first. Bring base panels into contact with each other, but do not force into place. Fit abutting ends and edges neatly; stagger end joints; arrange joints on opposite sides of partition so they occur on different studs.

Begin driving fasteners in center of panel and work toward ends and edges, holding gypsum base in firm contact with framing. Space fasteners as shown in table and not less than 3/8" from edges and ends of panel. Drive fastener heads flush with surface without breaking the face paper. If gypsum base appears to be loose from framing, install additional fasteners. Float vertical and horizontal interior corners by placing fasteners 8" out from the corner. Where framing is parallel with the corner, attach one panel to corner framing and float the abutting panel. Cut and fit gypsum base neatly around pipes and other openings. Remove loose face paper around cuts and use quick-setting plaster to close openings.

Control Joints—Apply control joints, where required, over the face of the gypsum base. Cut to required lengths with fine-toothed hack saw. Cut end joints square, align and butt together slightly gapped. Attach the control joint to gypsum base temporarily with 9/16" rosin-coated staples spaced 12" o.c. along each flange. Complete the installation of the control joint with fasteners (nails or screws) driven through the control joint flange into the framing on each side of the joint. The protective plastic tape over the open groove should be left in place until finishing is completed.

Metal Trim—Fasten gypsum base in normal manner but omit fasteners at framing member where metal trim is to be installed. Leave a space 3/8" to 1/2" wide between edge of base and face of jamb or wall. This provides space for hardware or door bucks and allows for expansion when trim is used for perimeter isolation. Slip trim over edge of base with expanded mesh flange on face side. Fasten to base by nailing or stapling 12" o.c.

Vinyl Trim—Slip vinyl trim over gypsum base with long flange behind base. Install the base with the trim firmly abutting the surface.

Corner Bead—Apply to all external angles. Hold tightly against angle and fasten to base by nailing or stapling 12" o.c. alternately on both flanges along entire length.

Acoustical Sealant—Seal edges of gypsum base around entire perimeter of partition. Also, seal air-tight all penetrations of the gypsum base, particularly electrical boxes. In addition to sealing the perimeter of electrical boxes, coat the back sides with a layer of acoustical sealant. Apply acoustical sealant under control joints and similar openings between the gypsum base and abutting materials.

Product Data

Materials: Panels with gypsum core, paper encased, square or tapered edges.
Compliance with Standards: IMPERIAL gypsum base meets ASTM Designation ASTM C1396/1396M.
Thermal coefficient of expansion (unrestrained): 9.2×10^{-6} in./in. x °F (40-100 °F); 16.2 mm/km x °C (4-38 °C).
Hygrometric coefficient of expansion (unrestrained): 7.2×10^{-6} in./in. x °F (7.2 mm/km x °C) at 5-90% R.H.
Storage: Store material in a cool, dry place. Avoid direct sunlight. Maintain temperature above 40 °F (4 °C).
Availability and Cost: IMPERIAL gypsum base is distributed throughout the United States. Contact a United States Gypsum Company sales office or sales person for additional information.
Types, sizes, packaging and weights:

Product	Thickness		Width		Length		Pc./ bdl.	Approximate weight	
	in.	mm	in.	mm	ft.	mm		lb./ 1000ft. ²	kg/ 100m ²
IMPERIAL Base									
FIRECODE	5/8	15.9	48	1219.2	8	2438.4	2	2330	1140
FIRECODE C	5/8	15.9	48	1219.2	14	4267.2	2	2480	1210

Submittal Approvals:

Job Name		
Contractor		Date

Trademarks

The following trademarks used herein are owned by United States Gypsum Company: DIAMOND, DURABOND, DUROCK, EASY SAND, FIRECODE, IMPERIAL, MOLD TOUGH, SHEETROCK, USG, USG in stylized letters.

Note

Products described here may not be available in all geographic markets. Consult your United States Gypsum Company sales office or representative for information.

Notice

We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Safety First!

Follow good safety and industrial hygiene practices during handling and installing products and systems. Take necessary precautions and wear the appropriate personal protective equipment as needed. Read material safety data sheets and related literature on products before specification and/or installation.



Fire-Shield®

Gypsum Board

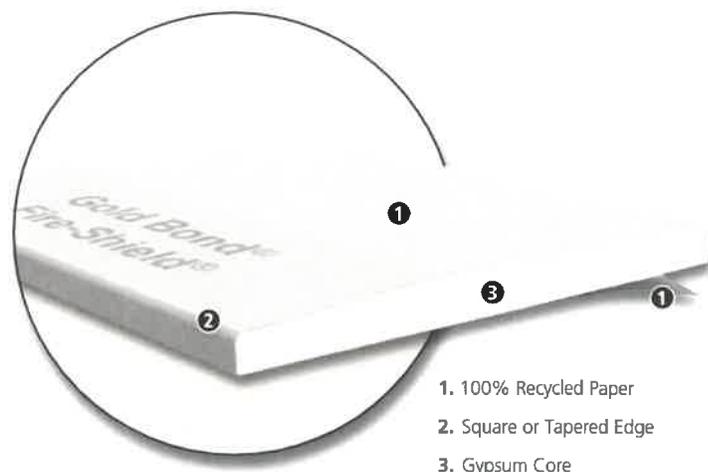
Gold Bond® BRAND Fire-Shield® Gypsum Board consists of a fire-resistant gypsum core with a heavy, natural finish and 100-percent recycled paper on the face and back sides. The face paper folds around the long edges to reinforce and protect the core, and the ends are cut square and finished smooth.

Use it for interior, fire-rated wall and ceiling applications. A specially formulated Type C core is also available where required.

For speed of installation, GridMarX® guide marks are printed on the paper surface.

Sizes: 1/2 in. (12.7 mm) thick Type C Boards are available in 4 ft. (1,219 mm) widths and in standard lengths of 6 ft. (1,829 mm) to 16 ft. (4,877 mm). 5/8 in. (15.9 mm) thick Type X and Type C Boards are available in 4 ft. (1,219 mm) and 54 in. (1,372 mm) widths and standard lengths of 6 ft. (1,829 mm) to 16 ft. (4,877 mm).

Finishing: Long edges of the boards are tapered or square. Tapered edges allow joints to be reinforced with ProForm® BRAND Joint Tape and concealed with ProForm® BRAND Ready Mix Joint Compounds or ProForm® BRAND Quick Set™ Setting Compounds.



1. 100% Recycled Paper
2. Square or Tapered Edge
3. Gypsum Core

Gold Bond®
BRAND
Gypsum Board

National 
Gypsum®

Gold Bond® BRAND Fire-Shield® Gypsum Board

Basic Uses

APPLICATIONS

Use 1/2 in. (12.7 mm) Type C and 5/8 in. (15.9 mm) Fire-Shield® Gypsum Boards on walls and ceilings in fire-rated construction where the framing members are spaced up to 24 in. (610 mm) o.c.

ADVANTAGES

- Approved component in specific UL-rated designs.
- Lightweight and cost-efficient material that is compatible with a wide range of decorative finishes.
- Cuts easily for quick installation, permitting painting or other decoration and the installation of metal or wood trim almost immediately.
- Fire-resistant material with a gypsum core that will not support combustion or transmit temperatures greatly in excess of 212°F (100°C) until completely calcined, a slow process.
- Dimensionally stable under changes in temperature and relative humidity and resists warping, rippling, buckling and sagging.
- Features the GridMarX® preprinted fastening guide on the board to allow for faster and more accurate installation.
- Achieves GREENGUARD and GREENGUARD Gold Certification. GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit: ul.com/gg.
- Qualifies as a low-VOC emitting material by meeting California Specification 01350. For more information, visit: <http://www.calrecycle.ca.gov/greenbuilding/specs/section01350/>.

Installation Recommendations

GENERAL

- Install gypsum board in accordance with methods described in ASTM C840 and GA-216.
- Examine and inspect framing materials to which gypsum board is to be applied. Remedy all defects prior to installation of the gypsum board.
- GridMarX 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 in. (102 mm) increments. Marks run along the edge in both tapers and at 16 in. (406 mm), 24 in. (610 mm) and 32 in. (813 mm) in the field of the board. The marks cover easily with no bleed-through using standard paint products.
- Apply gypsum board first to ceilings at right angles to framing members, then to walls. Use boards of maximum practical length so that the minimum number of end joints occur. Bring board edges into contact with each other but do not force into place.
- Install batt or blanket ceiling insulation BEFORE the gypsum board on ceilings when installing a vapor retarder behind the gypsum board. Install the insulation IMMEDIATELY after the gypsum board when using loose fill insulation. Avoid installation practices that might allow condensation to form behind boards.
- Cut gypsum board to allow for a minimum 1/4 in. (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 in. (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.

TECHNICAL DATA

PHYSICAL PROPERTIES			
	1/2" Fire-Shield C Gypsum Board	5/8" Fire-Shield Gypsum Board	5/8" Fire-Shield C Gypsum Board
Thickness¹, Nominal	1/2" (12.7 mm)	5/8" (15.9 mm)	5/8" (15.9 mm)
Width¹, Nominal	4' (1,219 mm)	4' (1,219 mm), 54" (1,372 mm)	4' (1,219 mm), 54" (1,372 mm)
Length⁴, Standard	6' – 16' (1,829 – 4,877 mm)	6' – 16' (1,829 – 4,877 mm)	6' – 16' (1,829 – 4,877 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)
Edges¹	Square or Tapered	Square or Tapered	Square or Tapered
Flexural Strength¹, Perpendicular	≥ 107 lbf. (476 N)	≥ 147 lbf. (654 N)	≥ 147 lbf. (654 N)
Flexural Strength¹, Parallel	≥ 36 lbf. (160 N)	≥ 46 lbf. (205 N)	≥ 46 lbf. (205 N)
Humidified Deflection¹	≤ 10/8" (31.8 mm)	≤ 5/8" (15.9 mm)	≤ 5/8" (15.9 mm)
Nail Pull Resistance¹	≥ 77 lbf. (343 N)	≥ 87 lbf. (387 N)	≥ 87 lbf. (387 N)
Hardness¹ – 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 Resistance⁵	R = .45	R = .56	R = .56
Product Standard Compliance	ASTM C1396	ASTM C1396	ASTM C1396
Fire-Resistance Characteristics			
Core Type	Type C	Type X	Type C
UL Type Designation	FSW-C	FSW	FSW-C
Combustibility²	Non-combustible Core	Non-combustible Core	Non-combustible Core
Surface Burning Characteristics³	Class A	Class A	Class A
Flame Spread³	15	15	15
Smoke Development³	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 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*

National Gypsum Company, *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® BRAND Fire-Shield® Gypsum Board

- Provide minimum 1/4 in. (6.4 mm) clearance between boards and adjacent concrete or masonry to minimize wicking of moisture.
- 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.

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 quality drywall 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.

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, install a vapor retarder 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 in. (305 mm) of the corners of window or door frames unless installing control joints at these locations.
- Space supporting framing for single-layer application of 1/2 in. (12.7 mm) and 5/8 in. (15.9 mm) gypsum board a maximum of 24 in. (610 mm) o.c.
- To prevent objectionable sag in gypsum board ceilings, the weight of overlaid, unsupported insulation should not exceed the following recommendations:

CEILING-SUPPORTED INSULATION

Type	Type X	Type C	Type C
Thickness, Nominal	5/8" (15.9 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Framing Spacing	24" o.c. (610 mm)	24" o.c. (610 mm)	24" o.c. (610 mm)
Weight of Ceiling-Supported Insulation	2.2 psf (10.7 kg/m ²)	1.3 psf (6.3 kg/m ²)	2.2 psf (10.7 kg/m ²)



Safety Data Sheet

SDS No. GB-1501
Gold Bond® BRAND
Gypsum Board Products

Section 1: Product and Company Identification

Product Name

Gypsum Board Products

Product Identifiers

½" Gypsum Board – Square Edge

½" Gypsum Board – Tapered Edge

¼" Gypsum Board – Tapered Edge

3/8" Gypsum Board – Tapered Edge

½" FS C Gypsum Board

5/8" Fire-Shield® Gypsum Board

5/8" Fire-Shield® C Gypsum Board

½" Sta-Smooth® Gypsum Board

½" FS C Sta-Smooth® Gypsum Board

5/8" FS Sta-Smooth® Gypsum Board

½" Durabase® Gypsum Board

5/16" Durabase® Gypsum Board

½" High Strength Ceiling Board

¼" High Flex® Gypsum Board

½" Foil Back Gypsum Board

5/8" FS Foil Back Gypsum Board

½" High Strength LITE Gypsum Board

5/8" High Strength Fire-Shield LITE Gypsum Board

5/8" High Strength Fire-Shield LITE 30 Gypsum Board

¾" Ultra-Shield™ Gypsum Board

½" MMR

½" ThermalFOIL® Gypsum Board

Gypsum Board Reclaim

Other means of identification

Wallboard, Gypsum Board

Recommended Use

Gypsum Board products are designed for specific applications that require properties such as: fire resistance, moisture resistance, abrasion resistance, sag resistance and other properties required for applications in walls and ceiling assemblies.

Use per manufacturer's recommendations.

Restrictions on Use

Use in well-ventilated area and avoid breathing dust.

Avoid skin contact.

Manufacturer/Supplier Details

National Gypsum Company

2001 Rexford Road

Charlotte, NC 28211

Emergency Telephone Number

Director Quality Services

(704) 551-5820 - 24 Hour Emergency Response

Website: www.nationalgypsum.com

Section 2: Hazards Identification

United States (US)

According to OSHA 29CFR 1910.1200 (HCS)

GHS Classification of the substance or mixture

Not classified

GHS Label Elements

Pictogram None

Signal Word None

Hazard Statements None

Precautionary Statements

Prevention

Do not breathe dust.
Use personal protective equipment as required. (See Section 8)
Use engineering controls and wet methods to minimize dust.

Response

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If on skin, wash with plenty of soap and water.
If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Get medical attention if exposed or concerned.

Storage

Store material in a cool, dry, ventilated area, away from excessive heat or sunlight.

Disposal

Dispose of material in accordance with federal, state, and local regulations

Section 3: Composition/Information on Ingredients

Chemical Name	Common name/ Synonym	Identifiers CAS Number	% (weight)	Impurities
Calcium Sulfate Dihydrate	Gypsum	13397-24-5	85-95	Crystalline silica (CAS # 14808-60-7)
Cellulose	Paper Fiber	9004-34-6	5-15	
And may contain:				
Mixture-calcium, aluminum silicates, amorphous silica	Fiberglass, synthetic, vitreous, continuous	65997-17-3	<1	

Section 4: First-Aid Measures

Inhalation Remove exposed individual to fresh air immediately. If breathing difficulty persists, seek medical attention.
Eye contact Do not rub or scratch eyes. Immediately flush eyes with water for 15 minutes.
Remove contact lenses (if applicable). Seek medical attention if irritation persists.
Skin contact Flush and wash skin with soap and water. Utilize lotions to alleviate dryness if present.
Seek medical attention if irritation persists.
Ingestion This product is not expected to be hazardous and no harmful effects are expected upon ingestion of small amounts. Larger amounts may cause abdominal discomfort or possible obstruction of the digestive tract.
Seek medical attention if problems persist.

Medical Conditions aggravated by exposure

Pre-existing upper respiratory and lung diseases such as, but not limited to, bronchitis, emphysema and asthma. Pre-existing skin diseases such as, but not limited to, rashes and dermatitis.

Section 5: Fire-Fighting Measures

Extinguishing Media

Dry chemical, foam, water, or extinguishing media appropriate for surrounding fire.

Unusual Fire and Explosion Hazards

Mixture poses no fire-related hazard.

Special hazards arising from the mixture

None known. Above 1450°C, material can decompose and release sulfur dioxide (SO₂) and oxides of carbon.

Special Protective Equipment and Precautions for Firefighters

A SCBA is recommended to limit exposures to combustion products when fighting any fire.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

No special precautions required.

General recommendations:

Wear appropriate Personal Protective Equipment. (See Section 8)

Maintain proper ventilation.

Environmental precautions

This product does not present an ecological hazard to the environment.

Dispose of in accordance with applicable federal, state, and local regulations.

Methods and materials for containment and cleaning up

Pick-up larger pieces to avoid a tripping hazard. Return large pieces of damaged/scraped material for recycling. Sweep or vacuum remaining material into a waste container for disposal. Use a light water spray to minimize dust generation. Maintain proper ventilation to minimize dust.

Section 7: Handling and Storage

Precautions for safe handling

Avoid breathing dust.

Minimize generation of dust.

Provide appropriate exhaust ventilation at places where dust is formed.

Avoid contact with eyes, skin and clothing.

Wear recommended personal protective equipment when handling. (See Section 8)

Conditions for safe storage, including any incompatibilities

Store material in a cool, dry, ventilated area, away from excessive heat or sunlight.

Store panels flat to minimize damage and warping.

Do not stack panels too high when storing to minimize the risk of falling.

Section 8: Exposure Controls/Personal Protection

Control Parameters

Component	Exposure Limits	
	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Calcium Sulfate Dihydrate	15 ^(T) 5 ^(R)	10 ^(T)
Crystalline Silica ¹	[(10) / (%SiO ₂ +2)] ^(R) ; [(30) / (%SiO ₂ +2)] ^(T)	0.025 ^(R)
Cellulose	15 ^(T) 5 ^(R)	10 ^(T)
Fiberglas, synthetic, vitreous, continuous	15 ^(T) 5 ^(R)	1 f/cc ^(R)

T- Total Dust

R-Respirable Dust

1-Present as an impurity in raw materials

Exposure Controls

Appropriate Engineering Controls

Work/Hygiene Practices: Utilize methods to minimize dust production. Utilize wet methods, when appropriate, to reduce generation of dust.

Ventilation: Provide local and general exhaust ventilation sufficient to maintain a dust level below the PEL/TLV.

Personal Protective Equipment

Respiratory Protection

A NIOSH approved particulate respirator is recommended in poorly ventilated areas or if the PEL/TLV is exceeded. OSHA's 29 CFR 1910.134 (Respiratory Protection Standard) must be followed whenever work conditions require respirator use.

Eye Protection

Safety glasses or goggles.

Skin

Gloves, protective clothing and/or barrier creams may be utilized if conditions warrant.

Section 9: Physical and Chemical Properties

- (a) **Appearance:** A white/gray gypsum core wrapped with paper. Surface finish will vary with product.
- (b) **Odor:** None
- (c) **Odor threshold:** Not available
- (d) **pH :** ~7
- (e) **Melting point/freezing point:** Not Available
- (f) **Initial boiling point and boiling range:** Not Available
- (g) **Flash point:** Not available
- (h) **Evaporation rate:** Not available
- (i) **Flammability (solid, gas):** Not flammable
- (j) **Upper/lower flammability or explosive limits:** Not available
- (k) **Vapor pressure:** Not available
- (l) **Vapor density:** Not available
- (m) **Relative density:** 2.3 g/cc
- (n) **Solubility(ies):** 2.1 g/L @ 20° C
- (o) **Partition coefficient: n-octanol/water:** Not available
- (p) **Auto-ignition temperature:** Not available
- (q) **Decomposition temperature:** 1450°C
- (r) **Viscosity:** Not available
- (s) **Volatile organic compound (VOC) content:** None

Section 10: Stability and Reactivity

- (a) **Reactivity:** No data available
- (b) **Chemical stability:** Stable in dry environments
- (c) **Possibility of hazardous reactions:** None known
- (d) **Conditions to avoid (e.g., static discharge, shock, or vibration):** None known
- (e) **Incompatible materials:** None
- (f) **Hazardous decomposition products:** None known. Above 1450° C gypsum will decompose to calcium oxide (CaO), with releases of sulfur dioxide (SO₂) and various oxides of carbon.

Section 11: Toxicological Information

Information on Toxicological effects

Information on likely routes of exposure

- Ingestion** Not a likely route of exposure. May result in obstruction or temporary irritation of the digestive tract.
- Inhalation** Dust may irritate respiratory system. Chronic exposure may result in lung disease. (See below)
- Skin contact** May cause irritation, itching, rash and/or redness, dry skin or dermatitis.
- Eye contact** May cause mechanical irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Acute exposure to airborne dust concentrations in excess of the PEL/TLV may result in coughing, dyspnea, wheezing, and a burning irritation of the nose, throat, and upper respiratory tract, along with possible impaired pulmonary function. Chronic exposure to crystalline silica (a naturally occurring contaminant) in the respirable size has been shown to cause silicosis, a debilitating lung disease, and lung cancer.

Continued and prolonged contact may result in dry skin. Contact with dust and/or fiberglass may produce itching, rash and/or redness. Repeated or prolonged exposure may result in dermatitis.

Toxicological data

No toxicological data is available for this product. Toxicological information for components of this product listed below.

- Acute toxicity** Gypsum: [OECD TG 420, Fixed dose procedure] Oral LD50 > 2,000-mg/kg b.w. for female rats (Sprague-Dawley)

Skin corrosion/irritation	Gypsum was not irritating to the skin of rabbits at 1, 24, 48 and 72 hours after removal of test patches [OECD TG 404]
Serious eye damage/eye irritation	Not available
Skin sensitization	There is no indication of skin sensitization in guinea pigs [OECD TG 406].
Respiratory sensitization	Not available
Sensitization	Not available
Mutagenicity	No evidence of mutagenicity on Ames Test.
Carcinogenicity	Not available
	This product contains crystalline silica (quartz) as a naturally occurring impurity in some of the raw materials. The International Agency for Research on Cancer (IARC) classifies crystalline silica inhaled in the form of quartz or cristobalite from occupational sources as carcinogenic to humans, Group 1. The National Toxicology Program (NTP) classifies respirable crystalline silica as a substance which may be reasonably anticipated to be a carcinogen. OSHA does not regulate crystalline silica as a human carcinogen. Exposures to respirable crystalline silica are not expected during the recommended use of this product. Industrial hygiene monitoring to date has not identified any detectable respirable crystalline silica in dust sampling conducted utilizing recommended application procedures. However, actual levels must be determined by workplace hygiene testing.
Reproductive effects	Not available
Specific target organ toxicity – single exposure	Not available
Aspiration toxicity	Not available

Section 12: Ecological Information

- (a) **Ecotoxicity (aquatic and terrestrial, where available):** This product does not present an ecological hazard to the environment.
- (b) **Persistence and degradability:** Unknown
- (c) **Bioaccumulative potential:** Gypsum is a naturally occurring mineral. Biodegradation and/or bioaccumulation potential is not applicable.
- (d) **Mobility in soil:** Unknown
- (e) **Other adverse effects (such as hazardous to the ozone layer):** None known

Section 13: Disposal Considerations

This material is not considered a hazardous waste. Dispose of according to Local, State, Federal, and Provincial Environmental Regulations.

Section 14: Transport Information

This product is not a DOT hazardous material
Shipping Name: Same as product name
ICAO/IATA/IMO: Not applicable

Section 15: Regulatory Information

All ingredients are included on the TSCA inventory.

Federal Regulations

SARA Title III: Not listed under Sections 302, 304, and 313

CERCLA: Not listed

RCRA: Not listed

OSHA: Dust and potential respirable crystalline silica generated during product use may be hazardous.

State Regulations

California Prop 65: Respirable crystalline silica is known to the state of California to cause cancer. Industrial hygiene monitoring during recommended use of this product failed to identify any respirable crystalline silica.

Canada WHMIS

All components of this product are included in the Canadian Domestic Substances List (DSL).

Crystalline silica: WHMIS Classification D2A

Section 16: Other Information

SDS Prepared by: National Gypsum Company
2001 Rexford Road
Charlotte, NC 28211

Phone Number: (704) 551-5820

Date of Preparation: April 20, 2015

Revision indicators and Date

Effective Date Change: 6/1/2015 Supersedes: April 1, 2015

Format Changes: Conforms to OSHA 29CFR 1910.1200 (HCS)

Key to Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstract Services Number
CFR	Code of Federal Regulations
DOT	Department of Transportation
EPA	Environmental Protection Agency
HEPA	High Efficiency Particulate Air
HCS	Hazard Communications Standard
HMIS	Hazardous Material Identification System
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
NIOSH	National Institute for Occupational Safety and Health
NFPA	National Fire Protection Association
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
TLV	Threshold Limit Value
TSCA	Toxic Substance Control Act
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein. This safety data sheet was prepared to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Disclaimer of Liability:

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Manufacturer

Georgia-Pacific Gypsum Georgia-Pacific Canada
 133 Peachtree Street 2180 Meadowvale Boulevard, Suite 200
 Atlanta, GA 30303 Mississauga, ON L5N 5S3
 Technical Service Hotline: 1-800-225-6119

Description

ToughRock® Fireguard 45® Gypsum Board has a noncombustible (per ASTM E136), dimensionally stable, gypsum core. The core is specially formulated, increasing the strength and resistance to the passage of heat. The surfacings on both facings and on the long edges are 100% recycled paper. The front facing (side to be finished) and the long edges are an ivory color; the back facing paper is gray. The ends are square cut, smooth finished with no paper facing. Georgia-Pacific ToughRock® Gypsum Board products are GREENGUARD and GREENGUARD Gold Certified for low emissions of volatile organic compounds (VOCs). They are listed in CHPS® High Performance Product Database for low emitting products.

Primary Uses

The 1/2" (12.7 mm) ToughRock Fireguard 45 Gypsum Board is a wall or ceiling covering material for use in new building construction or renovation. It is designed for direct attachment to wood or steel framing.

This product is 1/2" (12.7 mm) Type X as defined by ASTM C1396, gypsum board that provides not less than 45-minute fire resistance rating for boards 1/2" (12.7 mm) thick. It is used in select fire-rated wood-framed wall assemblies to help protect framing members from the spread of fire. With joints covered, ToughRock Fireguard 45 Gypsum Board will resist the passage of smoke. See the UL Online Certification Directory for information on fire-rated assemblies where ToughRock Fireguard 45 Gypsum Board is approved for use in the assembly.

It has also been formulated to perform like a gypsum ceiling board where improved sag resistance is desired, per ASTM C1396, section 12. It can be used on ceilings with 24" (610 mm) o.c. frame spacing when a water based texture is applied. Always seal board with a high quality latex primer before applying texture. Insulation should not exceed 2.2 lbs/sf. (9.9 km/m2).

ToughRock Fireguard 45 Gypsum Board is manufactured with an ivory paper facing designed to receive joint treatment, paint, wall covering, textured coatings or other finish treatment.

Limitations

- ToughRock Fireguard 45 Gypsum Board is a non-structural product and should not be used as a nailing base to support heavy wall-mounted objects.
- It is intended for interior applications only and it must be kept dry and not used where exposure to moisture is extreme or continuous.
- Do not use ToughRock Fireguard 45 Gypsum Board where there is prolonged exposure to temperatures exceeding 125°F (52°C) and/or continuous exposure to extreme humidity; e.g. located adjacent to wood burning stoves, heating appliances, steam rooms, showers, gang shower rooms and swimming pools.
- Consult water-based textures manufacturer's literature if they are to be used.

Applicable Standards

Manufactured to meet ASTM C1396 Sections 5 and 12.

Building Code Conformity

ToughRock Fireguard 45 Gypsum Board conforms to requirements of the current IBC and IRC codes for its intended use.

Sizes

Thickness, nominal 1/2" (12.7 mm)
 Widths, nominal 48" (1220 mm); 54" (1372 mm)
 Lengths, standard 8' (2440 mm) to 16' (4880 mm)

Edges

1/2" (12.7 mm) tapered edges.

Supplemental Materials

Fasteners: Nails or screws.

Joint System: Tape, bedding compound and topping compound.

Trims: Corner bead, edge/casing bead, control joints, floor/ceiling runners and channels.

Walls and ceiling textures.

Sealants.

Technical Data

Flame spread rating of 15 and smoke developed 0, when tested in accordance with ASTM E84. The core is noncombustible when tested in accordance with ASTM E136.

The 1/2" ToughRock Fireguard 45 is UL classified, Type FG.

Fire Resistance Ratings

ToughRock Fireguard 45 Gypsum Board meets the criteria for 1/2" (12.7 mm) Type X special fire resistance, as defined in ASTM C1396. ToughRock Fireguard 45 Gypsum Board is certified for fire-rated assemblies by UL LLC. Consult UL Fire Resistance Directory for specific assemblies where ToughRock Fireguard 45 Gypsum Board is approved for use.

Sound Control

ToughRock Fireguard 45 Gypsum Board can achieve designated Sound Transmission Class (STC) values when used in properly designed constructions.

Sound rated assemblies require sealing at top, bottom, intersections and other locations where sound leaks may develop. See the Gypsum Association Publication GA-600, Fire Resistance Design Manual, for sample sound isolation construction.

Application Standards

ToughRock Fireguard 45 Gypsum Board may be applied according to the Gypsum Association Publication GA-216 or ASTM C840 for non-fire rated construction.

For fire resistance construction application regarding board orientation, fastener type and spacing shall be consistent with the tested construction details. These details are published in the UL Online Certification Directory.

Handling and Use—Caution

This product may contain fiberglass 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.

Material Safety Data Sheet

Material Safety Data Sheet (MSDS) is available upon request or online at www.buildgp.com/safetyinfo.

continued →

Submittal Approvals

Job Name _____

Contractor _____

Date _____

Board Decoration

ToughRock® Fireguard 45® Gypsum Board is designed to accept most types of paints, texture and wall covering materials. Georgia-Pacific Gypsum strongly recommends priming the surface with a full-bodied, quality latex primer before applying a final decorative material. Priming will equalize the suction variation between the joint compounds and the paper surface. If glossy paints are used in such areas as kitchens or bathrooms, skim coat joint compound over the entire surface to reduce highlighting or joint photographing. This method is also recommended in areas with severe natural or artificial side lighting.

Georgia-Pacific Gypsum recommends application of a sealer prior to applying wallpaper or other wall covering to the board so that the board surface will not be damaged if the covering is subsequently removed during redecorating. Joint treatment must be thoroughly dry before proceeding with primer application and final decoration. Refer to Gypsum Association Publications GA-214 and GA-216 for joint treatment and finishing recommendations.

Physical Properties

Properties	1/2" (12.7 mm) ToughRock® Fireguard 45® Gypsum Board
Thickness, nominal inches	1/2" (12.7 mm), ± 1/64" (0.4 mm)
Width, nominal	4' (1220 mm), - 3/32" (2.4 mm); 54" (1372 mm), - 3/32" (2.4 mm)
Length, standard	8' (2440 mm) to 16' (4880 mm) ± 1/4" (6.4 mm)
Weight ¹ , lbs./sq. ft. nominal (kg/m ²)	1.6 (7.8)
Edges	Tapered, square or tapered with round edges
Surfacing	100% recycled paper face, back and long edges
Flexural strength ³ , min.	
Parallel, lbf. (N)	≥36 (160)
Perpendicular, lbf. (N)	≥107 (476)
R Value ² , °F·ft ² ·hr/BTU (m ² ·K/W)	0.45 (0.08)
Nail Pull Resistance ³ , minimum, lbf. (N)	≥77 (343)
Hardness, lbf. (N) (core, edges and ends)	≥15 (67)
Humidified deflection ³	5/16" (8 mm)
Surface Burning Characteristics ⁴ (per ASTM E84)	
Flame Spread	15
Smoke Developed	0
(The core is noncombustible when tested in accordance with ASTM E136.)	

¹ Represents approximate weight for design and shipping purposes. Actual weight may vary depending on manufacturing location and other factors.

² Per Gypsum Association document GA-235.

³ Specified minimum values are as defined in ASTM C1396.

⁴ Products qualify for NFPA Class A or IBC Class 1.



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 INFORMATION

U.S.A. and Canada: 1-800-225-6119, www.gpgypsum.com

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WARRANTIES, REMEDIES AND TERMS OF SALE For current warranty information for this product, please go to www.gpgypsum.com and select the product for warranty information. All sales of this product by Georgia-Pacific are subject to our Terms of Sale available at www.gpgypsum.com.

UPDATES AND CURRENT INFORMATION The information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION For product fire, safety and use information, go to www.buildgpc.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.

SAFETY DATA SHEET

1. Identification

Product identifier

Product list

Paper Faced Gypsum Panels

Product List A

ToughRock® Veneer Plaster Base (Blueboard)
ToughRock® Flexroc® Gypsum Board
ToughRock® Mold-Guard™ Gypsum Board
ToughRock® Basement Board® Gypsum Board
ToughRock® Sound Deadening Gypsum Board
ToughRock® Stretch 54® Gypsum Board
ToughRock® Soffit Board

Product List B

ToughRock® Gypsum Board

Product List C

ToughRock® Span 24® Lite-Weight Ceiling Board
ToughRock® Stretch 54® Lite-Weight Gypsum Board
ToughRock® Lite-Weight Gypsum Board
ToughRock® MH Ceiling Board
ToughRock® Fireguard X® Gypsum Board
ToughRock® Fireguard 45® Gypsum Board

Product List D

ToughRock® Gypsum Sheathing
ToughRock® Span 24® Ceiling Board
ToughRock® Fireguard X® Gypsum Sheathing
ToughRock® Fireguard X® Stretch 54® Gypsum Board
ToughRock® Fireguard X® Mold-Guard™ Abuse-Resistant Gypsum
ToughRock® Fireguard X® Veneer Plaster Board
ToughRock® Fireguard X® Mold-Guard™ Gypsum Board
ToughRock® Fireguard X® Mold-Guard™ Max-Abuse Gypsum Board
ToughRock® Fireguard X® Mold-Guard™ Max-Impact Gypsum Board

Product List E

ToughRock® Shaftliner
ToughRock® Fireguard C® Soffit Board
ToughRock® Fireguard C® Stretch 54® Gypsum Board
ToughRock® Lite-Weight Fire-Rated Gypsum Board

Product List F

ToughRock® Fireguard C® Gypsum Board
ToughRock® Lite-Weight Veneer Plaster Base

Other means of identification

Product code

GP-71A

Recommended use

Products accommodate wide range of wall, floor and ceiling applications and soffit treatments.

Recommended restrictions

Workers (and your customers or users in the case of resale) should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.

Manufacturer/Importer/Supplier/Distributor information

Company name	Georgia-Pacific Gypsum LLC		
Address	133 Peachtree Street, NE Atlanta, GA 30303		
Telephone	Technical Information	800.225.6119	
	(M)SDS Request	404.652.5119	
E-mail	Not available.		
Emergency phone number	Chemtrec - Emergency	800.424.9300	

2. Hazard(s) identification

Emergency overview	This product is not hazardous in the form in which it is shipped by the manufacturer but may become hazardous by downstream activities such as cutting, sanding, or otherwise working with this product that generate large amount of dusts. Those hazards associated with large amount of dusts are described below.		
Physical hazards	Not classified.		
Health hazards	Eye irritation	Category 2B	
Environmental hazards	Not classified.		
OSHA defined hazards	Not classified.		
Label elements			
Hazard symbol	None.		
Signal word	Warning		
Hazard statement	Causes eye irritation.		
Precautionary statement			
Prevention	Wash thoroughly after handling. Observe good industrial hygiene practices.		
Response	Wash hands after handling. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.		
Storage	Store away from acids.		
Disposal	Dispose of contents/container in accordance with applicable regulations.		
Hazard(s) not otherwise classified (HNOC)	None known.		
Supplemental information	None.		

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
CALCIUM SULFATE DIHYDRATE		10101-41-4	≤ 95
VERMICULITE****		1318-00-9	0 - 3
BORIC ACID**		10043-35-3	0.1 - 1
CONTINUOUS FILAMENT GLASS FIBERS***		65997-17-3	0.1 - 1
CRYSTALLINE SILICA (QUARTZ)*		14808-60-7	≤ 0.2

Composition comments

** Found in products in List B, C and F, Section 1 of this SDS.

*** Found in products in List C, D, E and F, Section 1 of this SDS.

**** Found in products in List E and F, Section 1 of this SDS.

Gypsum (calcium sulfate, dihydrate) contains naturally occurring silica crystalline (quartz), which is listed as a lung carcinogen. See Section 8 for exposure information.

*The weight percent for crystalline silica represents total crystalline silica and not the respirable fraction. Testing conducted by Georgia-Pacific did not detect respirable crystalline silica during activities associated with the normal use of this product; however, jobsite air monitoring should be conducted to determine actual exposure when permissible exposure limits may be exceeded.

**Testing conducted by Georgia-Pacific did not detect boric acid during activities associated with the normal use of this product; however, jobsite air monitoring should be conducted to determine actual exposure when permissible exposure limits may be exceeded.

4. First-aid measures

Inhalation	If dust from the material is inhaled, remove the affected person immediately to fresh air. Call a physician if symptoms develop or persist.
Skin contact	For skin contact, wash immediately with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Do not rub the eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Rinse mouth. May result in obstruction and irritation if ingested. Get medical attention.
Most important symptoms/effects, acute and delayed	Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Firefighters should wear full protective clothing including self contained breathing apparatus.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Avoid inhalation of dust from the spilled material. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Use personal protection recommended in Section 8. Keep unnecessary personnel away.
Methods and materials for containment and cleaning up	Minimize dust generation. Sweep up or gather material and place in an appropriate container for disposal. Utilize wet methods, if appropriate, to minimize dust. For waste disposal, see section 13 of the SDS.
Environmental precautions	Keep out of drains, sewers, ditches, and waterways.

7. Handling and storage

Precautions for safe handling	Provide appropriate exhaust ventilation at places where dust is formed. Minimize dust generation and accumulation. Do not breathe dust. Do not get this material in contact with eyes. Do not taste or swallow. Avoid prolonged exposure. Observe good industrial hygiene practices. Use only in well-ventilated areas. Wear appropriate NIOSH/MSHA approved dust mask or filtering facepiece if dust is generated. Do not eat or drink while using the product. Wash hands before eating, drinking, or smoking.
Conditions for safe storage, including any incompatibilities	Store level and keep dry. Dewpoint or other conditions causing the presence of moisture can damage the product during storage. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US OSHA Table Z-3: Time Weighted Average (TWA) (mg/m³)

Components	Type	Value	Form
VERMICULITE**** (CAS 1318-00-9)	TWA	5 mg/m ³	Respirable fraction.
		15 mg/m ³	Total dust.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
CALCIUM SULFATE DIHYDRATE (CAS 10101-41-4)	PEL	5 mg/m3	Respirable fraction.
CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7)	PEL	15 mg/m3 0.05 mg/m3	Total dust. Respirable dust.

ACGIH

Components	Type	Value	Form
CONTINUOUS FILAMENT GLASS FIBERS*** (CAS 65997-17-3)	TWA	5 mg/m3	Inhalable fraction.

US ACGIH Threshold Limit Values: Short Term Exposure Limit (STEL): mg/m3

Components	Type	Value	Form
BORIC ACID** (CAS 10043-35-3)	STEL	6 mg/m3	Inhalable fraction.

US ACGIH Threshold Limit Values: Time Weighted Average (TWA): mg/m3, non-standard units

Components	Type	Value	Form
BORIC ACID** (CAS 10043-35-3)	TWA	2 mg/m3	Inhalable fraction.
CALCIUM SULFATE DIHYDRATE (CAS 10101-41-4)	TWA	10 mg/m3	Inhalable fraction.
CONTINUOUS FILAMENT GLASS FIBERS*** (CAS 65997-17-3)	TWA	1 fibers/cm3	Fiber.
CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
CALCIUM SULFATE DIHYDRATE (CAS 10101-41-4)	TWA	5 mg/m3	Respirable.
CONTINUOUS FILAMENT GLASS FIBERS*** (CAS 65997-17-3)	TWA	10 mg/m3 5 mg/m3	Total Fiber, total
CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7)	TWA	0.05 mg/m3	Respirable dust.

Biological limit values

No biological exposure limits noted for the ingredient(s).

Exposure guidelines

Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled.

*Testing conducted by Georgia-Pacific did not detect respirable crystalline silica during activities associated with the normal use of this product; however, jobsite air monitoring should be conducted to determine actual exposure when permissible exposure limits may be exceeded.

**Testing conducted by Georgia-Pacific did not detect boric acid during activities associated with the normal use of this product; however, jobsite air monitoring should be conducted to determine actual exposure when permissible exposure limits may be exceeded.

Appropriate engineering controls	Score and snap method recommended. When using product, provide local and general exhaust ventilation to keep airborne dust concentrations below exposure limits. Use wet methods, if appropriate, to reduce the generation of dust. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Safety glasses or goggles are recommended when using this product. Ensure compliance with OSHA's PPE standard (29 CFR 1910.132 and .133) for eye and face protection. Eye wash fountain is recommended.
Skin protection	
Hand protection	For prolonged or repeated skin contact use suitable protective gloves.
Other	Impervious protective clothing and gloves recommended to prevent drying or irritation of skin. Ensure compliance with OSHA's PPE standards (29 CFR 1910.132 (general) and 138 (hand protection)). Safety shower/eye wash fountain is recommended in the workplace area (29 CFR 1910.151 (c)).
Respiratory protection	A NIOSH approved dust mask or filtering facepiece is recommended in poorly ventilated areas or when permissible exposure limits may be exceeded. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134) and ANSI's standard for respiratory protection (Z88.2).
Thermal hazards	Not applicable.
General hygiene considerations	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Keep away from food and drink.

9. Physical and chemical properties

Appearance	Paper faced gypsum boards
Physical state	Solid.
Form	Solid.
Color	Facing color varies
Odor	Odorless
Odor threshold	Not available.
pH	7
Melting point/freezing point	2642 °F (1450 °C) estimated
Initial boiling point and boiling range	Not applicable
Flash point	Not applicable
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not applicable
Flammability limit - upper (%)	Not applicable
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not applicable
Vapor density	Not applicable
Relative density	2.2 - 2.4 g/cm ³
Solubility(ies)	
Solubility (water)	0.2 % @ 22°C
Partition coefficient (n-octanol/water)	Not applicable
Auto-ignition temperature	Not applicable

Decomposition temperature	Not available.
Viscosity	Not applicable
Other information	
Flash point class	Not flammable
Specific gravity	2.2 - 2.4

10. Stability and reactivity

Reactivity	Contact with strong acids produces carbon dioxide.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).
Incompatible materials	Acids.
Hazardous decomposition products	May include and are not limited to: calcium oxide and sulfur dioxide.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Inhalation of dusts may cause respiratory irritation.
Skin contact	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Eye contact	Dust in the eyes will cause irritation.
Ingestion	Not applicable under normal conditions of use. May cause gastrointestinal irritation if ingested.

Symptoms related to the physical, chemical and toxicological characteristics
Irritation of eyes. Exposed individuals may experience eye tearing, redness, and discomfort.

Information on toxicological effects

Acute toxicity

Components	Species	Test Results
BORIC ACID** (CAS 10043-35-3)		
<u>Acute</u>		
Inhalation		
LC50	Rat	> 2 mg/l, 4 Hours
Oral		
LD50	Rat	2660 mg/kg
CALCIUM SULFATE DIHYDRATE (CAS 10101-41-4)		
<u>Acute</u>		
Oral		
LD50	Rat	> 1581 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation Dust in the eyes will cause irritation.

Respiratory or skin sensitization

Respiratory sensitization	Not likely to cause respiratory sensitization.
Skin sensitization	This product is not expected to cause skin sensitization.

Germ cell mutagenicity Not classified.

Carcinogenicity Not expected to be hazardous by OSHA/WHMIS criteria.

Exposure to respirable crystalline silica in the form of quartz or cristobalite from occupational sources is listed by IARC and NTP as a lung carcinogen. Prolonged exposure to respirable crystalline silica has been known to cause silicosis, a lung disease, which may be disabling. While there may be a factor of individual susceptibility to a given exposure to a respirable silica dust, the risk of contracting silicosis and the severity of the disease is clearly related to the amount of respirable crystalline silica exposure and the length of time (usually years) of exposure.

IARC Monographs. Overall Evaluation of Carcinogenicity

CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7) 1 Carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7) Cancer

US. National Toxicology Program (NTP) Report on Carcinogens

CONTINUOUS FILAMENT GLASS FIBERS*** (CAS 65997-17-3) Reasonably Anticipated to be a Human Carcinogen.

CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7) Known To Be Human Carcinogen.

Reproductive toxicity Not classified.**Specific target organ toxicity - single exposure** Not classified.**Specific target organ toxicity - repeated exposure** Not classified.**Aspiration hazard** Not classified.**Chronic effects** Not hazardous under normal conditions of use.**Further information** *Testing conducted by Georgia-Pacific did not detect respirable crystalline silica during activities associated with the normal use of this product; however, jobsite air monitoring should be conducted to determine actual exposure when permissible exposure limits may be exceeded.**12. Ecological information****Ecotoxicity** Not considered to be harmful to aquatic life.

Components	Species		Test Results
BORIC ACID** (CAS 10043-35-3)			
Aquatic			
Crustacea	EC50	Daphnia	766.5 mg/L, 48 Hours
Fish	LC50	Razorback sucker (<i>Xyrauchen texanus</i>)	> 100 mg/l, 96 hours
CALCIUM SULFATE DIHYDRATE (CAS 10101-41-4)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Fathead minnow (<i>Pimephales promelas</i>)	> 1970 mg/l, 96 hours
CONTINUOUS FILAMENT GLASS FIBERS*** (CAS 65997-17-3)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Zebra danio (<i>Danio rerio</i>)	> 1000 mg/l, 96 hours ECHA
CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Zebra danio (<i>Danio rerio</i>)	> 10000 mg/l, 96 Hours OECD SIDS

Persistence and degradability No data is available on the degradability of this product.**Bioaccumulative potential** No data available.**Mobility in soil** No data available.**Other adverse effects** No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.**13. Disposal considerations****Disposal instructions** Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.**Local disposal regulations** Dispose in accordance with all applicable regulations.**Hazardous waste code** The waste code should be assigned in discussion between the user, the producer and the waste disposal company.**Waste from residues / unused products** Dispose of in accordance with local regulations.**Contaminated packaging** Not available.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations

This product is not hazardous in the form in which it is sold and shipped by the manufacturer. However, the large amount of dusts generated by downstream activities such as cutting, sanding, or otherwise working with this product is considered hazardous and is regulated under the Hazard Communication Standard 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7) Cancer
 lung effects
 immune system effects
 kidney effects

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - No
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

BORIC ACID** (CAS 10043-35-3)
CRYSTALLINE SILICA (QUARTZ)* (CAS 14808-60-7)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	March-13-2015
Revision date	September-22-2017
Version #	03
HMIS® ratings	Health: 1 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 1 Flammability: 0 Instability: 0
Disclaimer	This SDS is intended to quickly provide useful information to the user(s) of this material or product. It is not intended to serve as a comprehensive discussion of all possible risks or hazards, and it assumes a reasonable use of the product. The information contained in this SDS is believed to be accurate as of the date of preparation of this SDS and has been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. The user or handler (or their employer) should consider the specific conditions in which this material will be used, handled, or stored and determine what specific safety or other precautions are required. Employers should ensure that their employees, agents, contractors, and customers who will use the product receive adequate warnings and safe handling procedures, including a current SDS. Product users or handlers (or their employer) who are unsure of what specific precautions are required should consult their employer, product supplier, or safety or health professionals before handling or working with this product. Please notify us immediately if you believe this SDS or other safety and health information about this product is inaccurate or incomplete.
Revision information	Product and Company Identification: Product Codes Accidental release measures: Methods and materials for containment and cleaning up Handling and storage: Conditions for safe storage, including any incompatibilities GHS: Classification



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ESR-1498

Reissued 12/2016

This report is subject to renewal 12/2018.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

STYROPEK USA, INC.

**16945 NORTHCHASE DRIVE, SUITE 1560
HOUSTON, TEXAS 77060**

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL



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ESR-1498

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A Subsidiary of the International Code Council®

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

STYROPEK USA, INC.
16945 NORTHCHASE DRIVE, SUITE 1560
HOUSTON, TEXAS 77060
(283) 876 3330

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)
- 2015, 2012, 2009 and 2006 *International Fire Code*® (IFC)
- 2015, 2012, 2009 and 2006 *International Energy Conservation Code*® (IECC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)[†]

[†]The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

- Other Code (see Section 8.0)

Properties evaluated:

- Physical properties
- Surface-burning characteristics
- Attic and crawl space evaluation

2.0 USES

STYROPEK polystyrene beads are used by independent manufacturers in the production of expanded polystyrene (EPS) insulation products.

3.0 DESCRIPTION

STYROPEK expandable polystyrene beads designated as STYROPEK® Types (F95)BF and (F95)BFL, are used by independent manufacturers to produce EPS insulation boards. Boards manufactured with the STYROPEK beads are produced through the introduction of heat. This process expands the beads which are then molded into

insulation boards with maximum densities and thicknesses no greater than those specified in Table 1. EPS boards formed from STYROPEK® beads have thermal resistance values as noted in Table 2. The end use of the polystyrene beads, including the manufacture of boards, is outside the scope of this report and must be addressed in a separate evaluation report. At densities and thicknesses no greater than those specified in Table 1, insulation boards produced from the STYROPEK® beads have a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

The expandable beads have been qualified in accordance with Section 4.5.15.1 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12). The boards can be used to produce expanded polystyrene products that comply with the ASTM C578 (with types as noted in Table 1), provided the final product is recognized in a current ICC-ES evaluation report and has been qualified in accordance with Section 4.5.15.1.2 of AC12.

4.0 INSTALLATION

4.1 General:

Installation must be as noted in the corresponding ICC-ES evaluation report on the foam plastic assembly, or as otherwise permitted in applicable codes noted in Section 1.0 of this report.

4.2 Installation in Attics or Crawl Spaces:

Insulation boards produced from STYROPEK® Types (F95)BF and (F95)BFL beads can be used in attics or crawl spaces with no covering applied to the attic or crawl space side of the foam plastic, provided all of the following conditions are met:

1. Entry to the attic or crawl space is only to service utilities, and no storage is permitted.
2. There are no interconnected attic or crawl space areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, as applicable. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.
5. Combustion air is provided in accordance with Section 701 of the *International Mechanical Code* (IMC) or Sections 701 and 703 of the 2006 IMC, as applicable.

6. The boards are produced from STYROPEK® Types (F95)BF and (F95)BFL, beads, and have a maximum thickness of 6.0 inches (102 mm) at 1.0 pcf (16.0 kg/m³), a maximum thickness of 3.25 inches (50.8 mm) at 2.0 pcf (32.0 kg/m³), or intermediate density and thickness combinations not to exceed the equivalent mass of 3.25 inches (50.8 mm) at 2.0 pcf (32.0 kg/m³) density boards.

5.0 CONDITIONS OF USE

The STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0, subject to the following conditions:

- 5.1 The maximum density and thickness of the insulation boards produced from the expanded beads are as noted in Table 1.
- 5.2 Products manufactured from the polystyrene beads described in this report must be recognized in a current ICC-ES evaluation report.
- 5.3 Insulation boards produced from STYROPEK® beads must be separated from the building interior by a thermal barrier complying with IBC Section 2603.4, IRC Section R316.4 (Section R314.4 for the 2006 IRC), or IFC Section 803.7.2, as applicable.
- 5.4 Boards produced from the STYROPEK® beads can be used in attic and crawl spaces without an ignition barrier as described in Section 4.2.
- 5.5 The STYROPEK® Types (F95)BF and (F95)BFL beads are produced by STYROPEK’s Mexican branch, STYROPEK DE MEXICO SA DE CV at Altamira, Tamaulipas, Mexico, with quality control inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated June 2015 (editorially revised May 2016), including data in accordance with Appendix B.

7.0 IDENTIFICATION

The bead containers must bear a label noting the component designation; the name and address of STYROPEK; the evaluation report number (ESR-1498); and the lot number.

8.0 OTHER CODES

In addition to the codes referenced in Section 1.0, the products described in this report were evaluated for compliance with the requirements of the 1997 *Uniform Building Code*® (UBC).

The STYROPEK® Types, (F95)BF and (F95)BFL expandable polystyrene beads comply with the UBC as described in Sections 2.0 to 7.0 of this report, with the revisions noted below:

- **Installation:** Same as Section 4.0, except replace item 4 in Section 4.2 with the following: Attic ventilation must be provided in accordance with UBC Section 1505, and under-floor (crawl space) ventilation must be provided that complies with UBC Section 2306.7.
- **Conditions of Use:** Same as Section 5.0, except replace the wording in Section 5.3 with the following: Insulation boards produced from STYROPEK® beads must be separated from the building interior by a thermal barrier complying with UBC Section 2602.4.

TABLE 1—MAXIMUM INSULATION BOARD DENSITY AND THICKNESS

BEAD TYPE	ASTM C578 Types	BEAD SIZE	MAXIMUM DENSITY (pcf)	MAXIMUM THICKNESS (inches)
(F95)BF	I, II, VIII, IX	195, 295, 295M, 395, 395S, 495	1.25	6
			2.0	5
(F95)BFL	I, II, VIII, IX	295, 395, 397, 397S, 495	1.25	6
			2.0	5

For SI: 1 inch = 25.4 mm, 1 pcf = 16.02 kg/m³.

TABLE 2—THERMAL RESISTANCE OF EPS FOAM PLASTIC INSULATION

EPS TYPE	MINIMUM DENSITY (pcf)	R-VALUE PER INCH OF THICKNESS (°F·ft ² ·h/Btu)
I	0.90	3.6
VIII	1.15	3.8
II	1.35	4.00
IX	1.80	4.20

For SI: 1 pcf = 16.02 kg/m³, 1°F·ft²·hr/Btu = 0.176 m²·K/W, 1°F = 1.8°C+32.

ICC-ES Evaluation Report

ESR-1498 FBC Supplement

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DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

STYROPEK USA, INC.
16945 NORTHCHASE DRIVE, SUITE 1560
HOUSTON, TEXAS 77060
(283) 876-3330

EVALUATION SUBJECT:

EXPANDABLE POLYSTYRENE BEADS: STYROPEK® TYPES (F95)BF AND (F95)BFL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads, recognized in ICC-ES master report ESR-1498, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2014 *Florida Building Code—Building*
- 2014 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads described in Sections 2.0 through 7.0 of the master evaluation report, ESR-1498, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the installation is in accordance with the 2012 *International Building Code*® (IBC) provisions noted in the master report.

Use of STYROPEK® Types (F95)BF and (F95)BFL expandable polystyrene beads has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 9N-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the master report, reissued December 2016.

ICC-ES Evaluation Report

ESR-1140

Reissued July 2017

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 05 23.10—Adhesives

REPORT HOLDER:

**ASHLAND SPECIALTY CHEMICAL COMPANY
5200 BLAZER PARKWAY
DUBLIN, OHIO 43017**

EVALUATION SUBJECT:

ISOGRIP® ADHESIVES:

**SP 2000D SERIES: SP 2020D, SP 2025D, SP 2030D
SP 3000D SERIES: SP 3020D, SP 3030D
SP 4000D SERIES: SP 4010D, SP 4020D
SP 5000D SERIES: SP 5000D, SP 5040D, SP 5050D, and SP 5100D**

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2009 and 2006 *International Building Code*®
- 2009 and 2006 *International Residential Code*®
- 2013 *Abu Dhabi International Building Code (ADIBC)*†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

Property evaluated:

Structural adhesives

2.0 USES

Isogrip® adhesives are used in the fabrication of laminated sandwich panels.

3.0 DESCRIPTION

The Isogrip® adhesives are one-part polyurethane adhesives used for bonding gypsum wallboard, mineral board, oriented strand board, plywood, fiberglass or metal to core materials of polystyrene and polyurethane foam plastics, and paper honeycomb materials, in laminated sandwich panel construction. These are Type II, Class 2, adhesives for structural use where high resistance to moisture is required in roof, wall and floor sandwich panels subject to sustained loadings.

The adhesives are available in 5-gallon (18.9 L) steel pails, 55-gallon (208 L) steel drums and 330-gallon (1250 L) totes. When stored in original unopened containers at temperatures between 45°F and 75°F (7.2°C and 23.9°C), the products have a shelf life of 90 days.

4.0 INSTALLATION

Surfaces to be bonded shall be clean and dry. Dust, oil, grease, water, paint and any other contaminants shall be removed prior to application of the adhesive. The amount of adhesive to be applied to contact surfaces must comply with the adhesive manufacturer's instructions. To ensure adhesion, the surfaces must be placed under pressure in accordance with the published instructions of Ashland Specialty Chemical Company.

The adhesives must be applied to one of the substrates to be bonded using roll coating, extruding techniques, or a swirl coater. The adhesives must be misted with water prior to covering with the other substrate being bonded.

Use of the adhesives must be in accordance with the provisions of the "ISOGRIP Adhesive Laminating Guide for Structural and Architectural Panels," as follows:

- ISOGRIP® SP 2020D, dated June 2000
- ISOGRIP® SP 2025D, dated April 2005
- ISOGRIP® SP 2030D, dated June 2000
- ISOGRIP® SP 3020D, dated December 1999
- ISOGRIP® SP 3030D, dated June 2000
- ISOGRIP® SP 4010D, dated May 1999
- ISOGRIP® SP 4020D, dated June 2000
- ISOGRIP® SP 5000D, dated April 2003
- ISOGRIP® SP 5040D, dated July 2003
- ISOGRIP® SP 5050D, dated July 2003
- ISOGRIP® SP 5100D, dated April 2003

5.0 CONDITIONS OF USE

The ISOGRIP® SP 2000D, SP 3000D, SP 4000D, and SP 5000D series adhesives described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The adhesive system must be applied and cured in accordance with this report and the manufacturer's instructions.
- 5.2 The adhesive application is limited to use in sandwich panels specifically recognized in an ICC-ES evaluation report.

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5.3 Based on creep test results, the maximum allowable design shear stress for the ISOGRIP polyurethane adhesive is 100 lbf/in² (689 kPa).

5.4 The adhesives are manufactured under a quality control program with inspections conducted by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Sandwich Panel Adhesives (AC05), dated June 2009.

7.0 IDENTIFICATION

Each container of adhesive has a label noting the date of manufacture, the ICC-ES report number (ESR-1140), the product name and the name of the manufacturer (Ashland Specialty Chemical Company).