

USG STRUCTO-CRETE® STRUCTURAL CONCRETE PANEL



A concrete subfloor that can be combined with other materials to create 1-, 2- and 3-hour fire-rated floor-ceiling assemblies.

A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.

- Strong, durable concrete panel with high diaphragm capacity for use in subfloor applications.
- Certified per UL and International Code Council (ICC) to meet ASTM E136 standard for noncombustibility and complies with IBC model codes.
- Dimensionally stable; panel will not swell or warp like wood sheathing in the presence of moisture or humidity.
- Installs like wood sheathing; circular saw for cutting, screws, or power-actuated fasteners (PAF) for fastening.
- No glue is required.

DESCRIPTION

USG STRUCTO-CRETE® Structural Concrete Panels (STRUCTO-CRETE® panels) are mechanically fastened to cold-formed steel joists, trusses, red iron, or wood framing members spaced up to 24 in (610 mm) on center (o.c.) to create a structural substrate for floors. A ceiling assembly is attached to the bottom of the floor joists, floor trusses, or other primary structural member to complete the construction of UL-rated floor-ceiling assemblies.

Panels can carry a total nominal load, live and dead, of 475 psf (22.7 kPa) when support framing is spaced 24 in (610 mm) o.c. Floor diaphragm design capacities up to 2,170 plf (31.6kNm) allow this panel to be used as a floor diaphragm in the structural design of the building.

Cuts with a standard framing, carbide-tipped saw blade and a circular saw equipped with dust collection or water spray suppression system to control airborne dust. Fasten using a screw gun and self-drilling, corrosion resistant fasteners. Refer to [USG Structural Panel Recommended Fasteners \(SCP95\)](#) for details. STRUCTO-CRETE® panels can be installed in most weather conditions, including mild precipitation (rain or snow), and temperatures from 0°F to 125°F (-18°C to 52°C) as no glue is required.

LIMITATIONS

- STRUCTO-CRETE® panels are not intended to be left in service exposed in an exterior location.
- STRUCTO-CRETE® panels shall not be left in service without an appropriate finish such as ceramic tile, vinyl, wood, carpet, or other approved materials.
- Adhesive application of floor covering directly to the panel is not recommended as future removal may damage the STRUCTO-CRETE® panels. USG recommends installation of an underlayment under all adhered flooring coverings except carpet and pad.
- STRUCTO-CRETE® panels can be supported by framing spaced up to 24 in (610 mm) o.c.

INSTALLATION

STRUCTO-CRETE® panels shall be installed per manufacturer's recommendations using recommended fasteners, see [USG Structural Panel Recommended Fasteners \(SCP95\)](#). Reference [USG Structural Panel Concrete Subfloor Architectural Specification \(SCP6A\)](#) and [USG Structural Panel Concrete Subfloor Field Installation Guidelines \(SCP14\)](#) for additional information. Improper installation will not allow the panels to perform with the structural capacities as outlined in the referenced third-party code reports listed in the table below. For a copy of the specification or third-party code reports, please see [USG.com/structural](#) or email usgstructural@usg.com. Panel layout should be designed to minimize cutting and ensure that all square cut ends and panel openings greater than 6" in any direction are supported by appropriate framing or blocking. Panels are to be butted tightly together; no gapping is required.

Appropriate safety procedures must be followed to protect installers from personal injuries resulting from improper lifting of materials, falling, and eye, hand, and lung irritation from dust. Refer to [OSHA Respirable Crystalline Silica Standard for Construction – Rule 29 CFR 1926.1153](#) and applicable federal, state, county, and local regulations for more information.

Care must be taken when placing pallets of STRUCTO-CRETE® panels on primary structural members. A pallet of 20 sheets of 3/4 in x 4 ft x 8 ft (19 mm x 1,220 mm x 2,440 mm) STRUCTO-CRETE® panels weighs approximately 3,400 lb (1,542 kg). Do not exceed floor structural limits when loading pallets or panels, or when placing on open structural members or completed floor assemblies. Where possible, store pallets of STRUCTO-CRETE® panels over load-bearing walls or next to structural walls where the joists meet the wall. See [USG Structural Panel Concrete Subfloor Field Installation Guidelines \(SCP14\)](#) for additional information.

FRAMING

The support framing must be designed to meet the strength, deflection, and serviceability criteria specified per the applicable building codes or engineering stamped contract documents. For diaphragm values listed in the Progressive Engineering Inc. (PEI) Product Evaluation Report [PER-13067](#), metal framing systems must be a minimum 43 mil (18 gauge) and spaced no greater than 24 in (610 mm) o.c. For steel framing, the bearing flange required will vary depending on the framing specified but must be a minimum 1-5/8 in (41 mm) wide and at least 3/4 in (19 mm) of the STRUCTO-CRETE® panel must bear on the support framing.

Please note that diaphragm capacity is related to the fastener minimum distance from the panel edge and the material of the support framing. Flange width may need to be increased to accommodate the minimum fastener distance from the edge of the panel. Follow the contract documents and the steel framing manufacturer's recommendations for the proper installation and bracing of the framing.

FASTENERS

Refer to [USG Structural Panel Recommended Fasteners \(SCP95\)](#) for fastener recommendations specific to the support framing used when installing STRUCTO-CRETE® panels. The recommended fasteners have been reviewed and tested to meet minimum criteria to ensure they have adequate strength, pull-out, pull-through, and slip performance. The recommended fasteners also meet or exceed the 1,000 hours corrosion resistance requirement when tested in accordance with ASTM B117. High corrosion resistance is necessary due to the pH levels found in cementitious panels. When exposed to any moisture, including high humidity, this elevated pH may deteriorate a non-corrosion resistant fastener.

General Fastener Notes: In accordance with the PEI Product Evaluation Report [PER-13067](#) and ICC Product Evaluation Report [ESR-1792](#), the maximum screw pattern spacing is 8 in (203 mm) o.c. along the perimeter of the panels and 12 in (305 mm) o.c. in the field of the panels. Fastener schedule may vary based on design capacities. Do not use a larger screw spacing unless specified by the structural engineer.

TRAFFIC PROTECTION

Place min. 3/8 in (10 mm) plywood, or similar sheathing material on the floor in high traffic areas to protect newly installed STRUCTO-CRETE® panels. See [USG Structural Panel Concrete Subfloor Field Installation Guidelines \(SCP14\)](#) for additional information.

APPLICATION

STRUCTO-CRETE® panels are cut to size with a circular saw equipped with a standard carbide-tipped framing blade and a dry dust collection device or a water spray suppression system that controls the amount of airborne dust. Wear safety glasses and a NIOSH-approved N95 dust mask when cutting. Dispose of collected dust in a safe manner and in compliance with local, state, and federal ordinances.

STRUCTO-CRETE® panels are installed with the long edges, tongue and groove (T&G), fully engaged perpendicular to the primary framing, and the square ends butted tightly together. Apply the panel with the print markings facing up toward the installer. Fasten each panel after it has been placed following the fastening schedule listed in the contract documents. The use of adhesives in addition to the screw attachment is not recommended. Install panels in a running bond pattern so that end joints fall over the center of the support framing members and are staggered by at least two supports from where the end joints fall in the adjacent rows. T&G joints and square ends shall be free of debris and fitted tightly without any gapping. For all panels less than 24 in (610 mm) wide, all edges must be supported by blocking. See [USG Structural Panel Concrete Subfloor Field Installation Guidelines \(SCP14\)](#) for additional information. The size of the framing flange required will vary based on the specified thickness of the support framing and the fastener selected. Refer to [USG Structural Panel Recommended Fasteners \(SCP95\)](#) for recommended fasteners, fastener minimum edge distances and minimum support framing flange widths.

EXPOSURE

Installed STRUCTO-CRETE® panels shall not be exposed to weather for more than 90 days. Care must be taken to avoid accumulation of snow and/or ice on installed panels. Brooms or leaf blowers should be used for snow removal whenever possible. Excessive shoveling or scraping may damage the installed panel surface.

In the event of significant accumulations of snow and/or ice, use indirect heat from temporary space heaters to melt the affected areas. To prevent damage to the STRUCTO-CRETE® panels, never expose the panels to direct flame for the purpose of snow removal and/or de-icing efforts. **Salts, fertilizers, or other chemicals are never to be used on the panels for anti-icing and/or de-icing purposes.**

SURFACE FINISH

Follow the contract documents, floor finish, and roofing system manufacturer's recommendations for the application of finished flooring and roofing systems. Note that most floor finishes will require an underlayment over STRUCTO-CRETE® panels. Before the application of any finishing materials, ensure that all panels are properly fastened, with the fastener head driven flush or slightly below the surface of the panels.

CEILING CONSTRUCTION

For fire- and sound-rated assemblies, the installed ceiling must comply with the UL-listed design and USG recommendations. Follow the contract documents and the ceiling manufacturer's instructions for the ceiling installations. USG Sheetrock® Brand Firecode® C Panels (UL Type C), USG Sheetrock® Brand EcoSmart Panels Firecode® (UL Type ULIX™) or a plaster ceiling should be applied to resilient channels that are fastened to the joists. A drywall or acoustical suspended ceiling system may also be used to enhance sound performance. For a complete list of UL designs visit USGStructuralUL.com or see the [USG Structural Panel Fire and Acoustic Manual \(SCP100\)](#).

PRODUCT DATA

Sizes and Packaging: 3/4 in x 4 ft x 8 ft (19 mm x 1,220 mm x 2,440 mm). STRUCTO-CRETE® panels are packaged in 20-piece pallets that each weigh approximately 3,400 lb (1,542 kg) and 14 pallets ship via each flat-bed truckload (12 pallets in Canada).

Product Codes:

Item Number	Product
102038	STRUCTO-CRETE® panel - T&G - 3/4 in x 4 ft x 8 ft (19 mm x 1,220 mm x 2,440 mm)
102039	STRUCTO-CRETE® panel - SQ - 3/4 in x 4 ft x 8 ft (19 mm x 1,220 mm x 2,440 mm)

Availability: STRUCTO-CRETE® panels are sold through any distributor that carries USG products. Email usgstructural@usg.com for technical questions, availability and dealers in your area, or search [USG Where to Buy](#) for availability near you.

Handling: STRUCTO-CRETE® panels weigh approximately 170 lb (77 kg) and are intended to be handled by two people. Each 20-piece pallet of 3/4 in x 4 ft x 8 ft (19 mm x 1,220 mm x 2,440 mm) STRUCTO-CRETE® panels weigh approximately 3,400 lb (1,542 kg). Do not exceed the destination's capacity when loading full pallets or loose panels on vehicles, trailers, or placing them in storage. Use forklifts which are adequate to carry the pallet load with a minimum rating of 5,000 lb (2,268 kg) and 96 in (2,440 mm) width. Leave a minimum 2 in (50.8 mm) gap between pallet and forklift backrest and always pick the load up from the **groove** side of the pallet to avoid damage to the **tongue** side of the panels.

Storage: STRUCTO-CRETE® panels shall be stored above ground in a dry, ventilated space in a horizontal position and uniformly supported. Stack pallets a maximum of 4 high with a minimum of 4 in (102 mm) clear space around the perimeter of the product on a flat, stable surface capable of supporting the weight of the material.

Jobsite: Pallets are to be stored flat on a stable surface capable of supporting the weight. Stock individual panels flat on risers a maximum 4 ft (1,220 mm) o.c. with end supports within 12 in (305 mm) of panel ends. Individual panels must never be stored in an upright position, on their edges leaning against a wall or other vertical support.

Typical Construction Equipment Loads

Equipment	Capacity	Max Weight Allowed
Drywall Cart	10 - 5/8 in x 4 ft x 12 ft Gypsum panels	1,200 lb (544 kg)
	7 - 3/4 in x 4 ft x 8 ft STRUCTO-CRETE® panels	1,200 lb (544 kg)
Rolling Trash Cart		1,000 lb (453 kg)
Rolling Scaffold (Baker)		750 lb (340 kg)

STRUCTO-CRETE® panels must be covered when stored in unprotected areas to avoid damage and panels freezing together from excessive moisture and freezing temperatures. If panels become frozen together within a unit, the unit needs to be brought to a temperature above 32°F (0°C) to allow the ice to melt naturally. Salt, fertilizer, other de-icing agents, or direct artificial heat should not be used at any time.

Maintenance: STRUCTO-CRETE® panels do not require any regular maintenance except to remove standing water and repair damage from abuse. Any cracked or broken panels should be replaced with sound STRUCTO-CRETE® panels that are secured following the fastening schedule prescribed in the original installation documents.

PRODUCT DATA CONT.

Repairs: Previously installed STRUCTO-CRETE® panels with T&G damage up to 10% of the edge length may be repaired using the recommendations located in *USG Structural Panel Concrete Subfloor Repair Manual (SCP76)*. Panels with more significant damage must be replaced. The replacement panel(s) must be a minimum of 24 in (610 mm) wide and span a minimum of two supports or they must be fully blocked on all sides. Refer to *USG Structural Panel Concrete Subfloor Field Installation Guidelines (SCP14)* for additional information.

SYSTEM PERFORMANCE

TEST DATA

Physical and Mechanical Properties	Test Standard (Min. Values)	Test Values Standard (Metric)
Concentrated load	ASTM E661 (550 lb, 0.108 in)	804 lb (3.58 kN) static 0.066 in (1.7 mm) max. deflection @ 200 lb (0.89 kN)
Fastener lateral resistance ^a	ASTM D1761, Sec. 10.2 (dry >210 lbf, wet >160 lbf)	776 lbf (3.45 kN) dry 800 lbf (3.56 kN) wet
Density ^b	ASTM C1185 (75 lb/ft ³)	78.6 lb/ft ³ (1,258 kg/m ³)
Weight at 3/4" (19 mm) thickness	ASTM D1037	5.3 lb/ft ² (26 kg/m ²)
pH value	ASTM D1293	10.5
Linear variation with change in moisture (25% to 90% relative humidity)	ASTM C1185, Sec. 8 (<0.10%)	0.06%
Thickness swell	ASTM D1037, B (≤3.0%)	0.04%
Freeze / thaw resistance	ASTM C1185 (75%)	100% properties retention
Mold resistance	ASTM D3273 (10)	10
Water absorption ^c	ASTM C1185, Sec. 5.2.3.1 (<15%)	9.0%
Noncombustibility	ASTM E136 (unmodified) CAN/ULC-S114	Passed Passed
Surface-burning characteristics (flame spread/smoke developed)	ASTM E84 (0/0) CAN/ULC-S102 (0/0)	0/0 0/0
Long-term durability	ASTM C1185, Sec. 13 (75%)	100% properties retention
Water durability	ASTM C1185, Sec. 5 (70%)	83% properties retention
Termite resistance	AWPA Standard E1-13	9.8
Low VOC emissions	CDPH/EHLB/Standard Method V1.1-2010 ^d	Compliant

(A) Fastener lateral resistance measured with #8, 1-5/8 in (41 mm) Hi-Low screw.
 (B) Density measured at equilibrium conditioning per Section 5.2.3.1., 28 days after manufacturing.
 (C) Absorption measured from equilibrium conditioning followed by immersion in water for 48 hours.
 (D) Reference Standard: California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010 (Emission testing method for CA Specification 01350).

CODE COMPLIANCE

Description	Reference
Code Reports	ICC ESR-1792 ; PEI PER-13067
City Code Approvals	Los Angeles: LARR # 25682
Ultimate Uniform Load (total DL and LL)	ICC ESR-1792 ; PEI PER-13067
Shear Diaphragm Ratings	1,468 plf (21.4 kNm) ^A
UL 1-, 1.5-, 2-Hour Fire Resistance Designs ^C	G535, G536, G556, G557, G602 (2- & 3-hr.), H501™ , H505, H510, H515, H521, H522, H524
ULC 1-, 1.5-, 2-Hour Fire Resistance Designs ^C	I526, I527, I528, I529, M520, M521
UL 2-, 3-Hour Load-Bearing Walls ^C	V465, V471
UL/ULC Metal and Plastic Through-Penetration Firestop Systems	F-E-1023, F-E-1032, F-E-2045
Acoustical Ratings	>65 IIC b >56 STC b

- (A) Joists spaced 24 in (610 mm) o.c. and fasteners spaced 6 in (153 mm) o.c. at the perimeter and 12 in (305 mm) o.c. in field, blocked. See the PEI Product Evaluation Report [PER-13067](#).
- (B) Carpet and pad over STRUCTO-CRETE® panels attached to cold-formed steel framing with a ceiling consisting of resilient channels spaced 12 in (305 mm) o.c., 3 1/2 in (89 mm) of fiberglass insulation in the joist cavity and a single layer of 5/8 in (16 mm) USG Sheetrock® Brand Firecode® C Gypsum Panel.
- (C) For additional information and the most up-to-date UL/ULC designs, visit [USGStructuralUL.com](#).

LOAD TABLE

This table represents the ultimate uniform gravity load capacities for STRUCTO-CRETE® panels used for floors. For the most up-to-date floor system load tables, see the PEI Product Evaluation Report [PER-13067](#), the ICC Product Evaluation Report [ESR-1792](#) or for technical assistance, email usgstructural@usg.com.

Framing Spacing inches (mm)	Ultimate Uniform Load psf
12 in (3,045)	1,958 (93.7)
16 in (407)	1,171 (56.1)
19.2 in (488)	875 (41.9)
24 in (610)	475 (22.7)

1 in = 25.4mm, 1 psf = 47.88 Pa.

- Ultimate load values shown have no safety factor included.
- These loads represent the load carrying capacity of the panels spanning between a minimum of two framing spans per panel piece. The table does not consider the influence of joist deflection.
- Values based on panel flexural strength and stiffness properties.
- Blocking at all joints perpendicular to framing to be a minimum of 16 gauge (54 mils, or 0.0538 inch [1.37 mm]), 3-5/8 in (92 mm) wide track. For sheathing installation where a single span condition exists, additional track blocking is required perpendicular to the framing located mid-way between the edges of the panel.

A qualified architect or engineer should design, review, and approve all floor or roof system applications.

SUBMITTAL APPROVALS

Job Name	
Contractor	Date

PRODUCT INFORMATION

See usg.com for the most up-to-date product information.

DAANGER

Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer by inhalation of respirable crystalline silica. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Use only in a well-ventilated area, wear a NIOSH/MSHA approved respirator. Wear protective gloves/protective clothing/eye protection. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Immediately call a poison center/doctor. If on skin: Wash with plenty of water. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace. If skin irritation or rash occurs, or otherwise exposed or concerned: Get medical attention. Store locked up. Dispose of in accordance with local, state, and federal regulations. For more information call Product Safety: 800 507-8899 or see the SDS at usg.com.

KEEP OUT OF REACH OF CHILDREN.

TRADEMARKS

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SAFETY FIRST!

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protection equipment. Read SDS and literature before specification and installation.

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Manufactured by
United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

MSRP based upon full truckload delivered to jobsite: STRUCTO-CRETE® panel \$4.70/psf

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