

Structo-Crete™ Structural Concrete Panel

A structural concrete panel that can be combined with other noncombustible materials to create 1- and 2-hour fire-rated floor-ceiling assemblies.

- Strong, durable cement panel
- Dimensionally stable, panel will not buckle or warp like wood sheathing
- Installs like wood sheathing; circular saw for cutting, screws for fastening
- Meets the criteria of ASTM E136-04 for use in all types of noncombustible construction

Description

STRUCTO-CRETE™ structural concrete panels are mechanically fastened to cold-formed steel joists or framing members. A noncombustible ceiling assembly is attached to the bottom of the floor joists to complete the construction. This floor system is designed to carry gravity and lateral loads. Finished floor materials, such as carpet and pad, may be applied directly over STRUCTO-CRETE structural concrete panels.

STRUCTO-CRETE structural concrete panels can carry a total load, live and dead, of 110 psf on cold-formed steel framing spaced 24" o.c. Shear diaphragm design ratings up to 580 plf for seismic loading and 725 plf for wind loading allow this panel to be used as a shear diaphragm in the structural design of the building.

When applied over steel framing, covered with carpet and pad, with a double-layer drywall ceiling attached to resilient channels below the framing, a floor system using STRUCTO-CRETE structural concrete panels can achieve a 56 STC and a 65 IIC sound performance rating. Additional acoustically rated systems for various floor and ceiling finishes are available.

STRUCTO-CRETE structural concrete panels have a linear variation with change in moisture content of less than 0.10%. This means that the panels will not buckle or warp like wood sheathing.

Cutting STRUCTO-CRETE structural concrete panels requires a carbide-tipped saw blade and a circular saw equipped with dust collection or suppression to lessen airborne dust. Fastening is also conventional, using a screw gun and self-drilling No. 8- to No.10-gauge screws. Because these panels are so durable, they may be installed in most weather conditions including mild precipitation (rain or snow) and temperatures from 0 °F to 125 °F.

Limitation

STRUCTO-CRETE structural concrete panels should not be left in service without an appropriate finish floor covering. Floor coverings such as ceramic tile, vinyl, wood, carpet or other approved materials are required for all applications.

Installation

To perform in the expected manner, STRUCTO-CRETE structural concrete panels must be installed according to USG specifications, using only the listed materials and components. For a complete set of specifications, email structo-crete@usg.com.

As with all types of construction, appropriate safety procedures must be followed to protect installers from personal injuries resulting from lifting incorrectly, falling, and eye, hand and lung irritation.

Care must be taken when placing pallets of STRUCTO-CRETE structural concrete panels on floor framing. A pallet of STRUCTO-CRETE panels (20 sheets, 3/4" x 4' x 8') weighs approximately 3000 lbs. Do not exceed floor limits when loading pallets or panels on open framing or completed floor assemblies. Store units next to structural walls where the joists meet the wall.

Framing

The steel floor framing must be designed to meet the strength and deflection criteria specified in the contract documents. The attachment flange or bearing edge must be a minimum 1.625" (41 mm) wide with a minimum .5" (12mm) return flange. Metal framing must be a minimum 18 gauge and spaced no greater than 24" o.c. Follow the contract documents and the steel framing manufacturer's recommendations for the proper installation and bracing of the framing.



**USG Fortcrete is now Structo-Crete™
Same great panel**

Application

Cut panels to size with a circular saw equipped with carbide-tipped blade and a dry dust collection device or a water-dispensing device that limits the amount of airborne dust. Wear safety glasses and a NIOSH-approved N95 dust mask when cutting this panel. Dispose of collected dust in a safe manner and in compliance with local, state and federal ordinances.

Install STRUCTO-CRETE structural concrete panels with the long edges perpendicular to the framing. Apply the panel with the markings toward the installer. Fasten each panel after it has been placed following the fastening schedule listed in the contract documents. Install panels in a running bond pattern so that end joints fall over the center of the framing members and are staggered by at least two supports from where the end joints fall in the adjacent rows. For all panels less than 24" wide, all edges must be supported by blocking. Blocking must be cold-formed from steel complying with AISI-General, with a minimum 43 mils (0.0428 inch or 1.09 mm) base metal thickness (No. 18 gauge) and a minimum G60 galvanized coating. The attachment flange or bearing edge must be at least 1.625 inches (41 mm) wide.

Installed 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 should be used for snow removal whenever possible. Excessive shoveling or scraping may damage 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 STRUCTO-CRETE structural concrete panels, never expose the panels to direct flame for the purpose of snow removal and/or de-icing efforts. At no time should salts, fertilizers or other chemicals be used on the panels for anti-icing and/or de-icing purposes.

Floor Finish

Follow the contract documents and the floor finish manufacturer's recommendations for the application of finished flooring. Before the application of floor finish 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. A SHEETROCK® brand gypsum panel or a plaster ceiling may be applied directly to the floor/ceiling framing or to resilient channels that are fastened to the joists. A drywall or acoustical suspended ceiling system may also be used to enhance sound performance.

Product Data

Sizes and Packaging 3/4" x 4' x 8' panels. Each panel weighs approximately 150 lbs. and is intended to be handled by two people. STRUCTO-CRETE structural concrete panels are packaged in 20-piece units.

Availability STRUCTO-CRETE structural concrete panels are sold through select USG distributors. Email structo-crete@usg.com for information on availability and a dealer in your area.

Storage STRUCTO-CRETE structural concrete panels are shipped in 20 piece units. Panels should be stored in a horizontal position and uniformly supported. Panels must be covered when stored in unprotected areas.

Excessive moisture and freezing temperatures may result in panels sticking together within the units. Therefore, care should be taken to ensure units of STRUCTO-CRETE structural concrete panels are not exposed to excessive moisture, ice and snow. In the event that panels do become frozen together within a unit, the unit needs to be brought to a temperature of 32 °F to allow the ice to melt naturally. Salt, fertilizer or other de-icing agents should not be used at any time. Covering the units completely with tarps or similar coverings is an easy way to avoid panels freezing together.

Maintenance STRUCTO-CRETE structural concrete 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 structural concrete panels that are secured following the fastening schedule prescribed in the original installation documents. The replacement panels must be a minimum of 24" wide, or the edge blocked, and must span a minimum of two supports.

Test Data

Physical and Mechanical Properties	Test Standard	Typical Values Standard (Metric)
Moment capacity (3/4" thick panel)	ASTM C1185, 5.5	1585 lb-in/ft (588 N-m/m)
Bending stiffness (3/4" thick panel)	ASTM C1185, 5.5	315,000 lb-in ² /ft (3kN-m ² /m)
Compressive strength	ASTM C109	2500 psi (17 MPa)
Concentrated load	ASTM E661	400 lbs (1.78 kN) static 0.125" (3.2 mm) max. deflection @ 200 lbs (0.89 kN)
Fastener lateral resistance ^a	ASTM D1761,S.10.2	> 210 lb (0.93 kN) dry > 160 lb (0.71 kN) wet
Density ^b	ASTM C1185	75 lb/ft ³ (1200 kg/m ³)
Weight at 3/4" thickness	ASTM D1037	4.7 lbs/ft ² (23 kg/m ²)
pH value	ASTM D1293	10.5
Linear variation with change in moisture (25% to 90% relative humidity)	ASTM C1185, S.8	<0.10 %
Thickness swell	ASTM D1037, B	max. 3.0 %
Freeze / thaw resistance	ASTM C1185	Passed (50 cycles)
Mold resistance	ASTM D3273 ASTM G21	10 0
Water absorption ^c	ASTM C1185, 5.2.3.1	<15.0 %
Noncombustibility	ASTM E136 (-04)	Passed
Surface-burning characteristics (flame spread/smoke developed)	ASTM E84	0/5
Long-term durability	ASTM C1185, S.13	min. 75% retention of physical properties
Water durability	ASTM C1185, S.5	min. 70% retention of physical properties

(a) Fastener lateral resistance measured with 1-5/8" 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.

Description	Reference
Code Report	ICC ESR-1792
City Code Approvals	New York: MEA # 214-07-M, MEA # 229-07-M Los Angeles: LARR # 25682
UL 1-, 1.5-, 2-Hour Fire Resistance Designs	G535, G536, G556, G557, G558, G562, G569, G570, L570, M502, M506
ULC 1-, 1.5-, 2-Hour Fire Resistance Designs	I528, I529
UL Metal and Plastic Through-Penetration Firestop Systems	F-E-1023, F-E-2031
Acoustical Ratings	>65 IIC ^a >56 STC ^a

(a) Carpet and pad over STRUCTO-CRETE panels attached to cold-formed steel framing with a ceiling consisting of resilient channels spaced 12" o.c., 3-1/2" of fiberglass insulation in the joist cavity and a single layer of 5/8" Type C gypsum panel.

Load Table

These loads represent the load-carrying capacity of the panels spanning between floor joists. Loads are based on a 3-span condition and loading on all spans. For load conditions other than 3-span or uniform loads, please contact structo-crete@usg.com. A qualified architect or engineer should review and approve the calculations for all projects. For Sl: 1 inch = 25.4 mm, 1 foot = 0.305 m, 1 pound = 0.004448 kN, 1 pound per square foot = 0.0479 kN/m².

Deflection	Allowable Superimposed Uniform Loads (psf) for Given Joist Spacing		
	16'	20'	24'
L/240	245	170	110
L/360	245	170	110
L/480	245	160 ^a	80 ^a

(a) Load capacity limited by panel deflection. All other values are limited by panel strength.

Submittal Approvals

Job Name		
Contractor		Date

Product Information

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

WARNING!
Portland cement is strongly alkaline. Direct contact can be corrosive and cause severe damage or chemical burns to the eyes and wet or moist skin. Avoid contact with eyes and skin. Wear eye protection, alkali-resistant protective gloves, long-sleeved shirts and pants to prevent direct contact. If eye contact occurs, immediately flush thoroughly with water for 30 minutes and seek medical advice. Inhalation of dust may be corrosive or cause chemical burns or irritation to nose, throat and respiratory tract. Avoid breathing dust. Use in a well-ventilated

area or provide sufficient local ventilation. If dusty, wear a NIOSH/MSHA-approved dust respirator. Wash thoroughly with soap and water after use. Do not ingest. If ingested, call physician. If cutting board with a power tool, use a wet or vacuum saw to reduce the amount of dust generated. Panels are heavy and can fall over, causing serious injury or death. Avoid creating a tripping hazard and do not exceed floor limit loads. Long-term breathing of respirable crystalline silica dust can cause permanent lung damage and/or cancer. Product safety information: 800 507.8899 or usg.com.

KEEP OUT OF REACH OF CHILDREN.

Trademarks

The following trademarks used herein are owned by United States Gypsum Company or a related company: SHEETROCK, STRUCTO-CRETE, USG, USG in stylized letters.

Notice

We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by applications 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 30 days from date it was or reasonable should have been discovered.

Safety First!

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

