

# CGC STRUCTURAL PANEL CONCRETE ROOF DECK



**A concrete roof deck that can be combined with other noncombustible materials to create one- and two-hour fire-rated roof-ceiling assemblies.**

- Strong, durable concrete panel; great uplift ratings
- Dimensionally stable; panel will not buckle or warp like wood sheathing; no moisture issues like structural concrete
- Installs fast and easy: circular saw for cutting; screws for fastening
- Meets the criteria of ASTM E136 for use in all types of noncombustible construction

## DESCRIPTION

CGC Structural Panel Concrete Roof Decks are mechanically fastened to cold-formed steel joists or framing members. This roof system is designed to carry gravity and lateral loads. Roof membranes may be applied directly over CGC Structural Panel Concrete Roof Decks.

CGC Structural Panel Concrete Roof Decks can carry a total load, live and dead, of 7.2 kPa (150 psf) on cold-formed steel framing spaced 1220 mm (48").

CGC Structural Panel Concrete Roof Decks 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 CGC Structural Panel Concrete Roof Decks 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-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 -18°C to 52°C (0°F to 125°F).

## LIMITATION

CGC Structural Panel Concrete Roof Decks should not be left in service without an appropriate roof membrane covering.

## INSTALLATION

To perform in the expected manner, CGC Structural Panel Concrete Roof Decks must be installed according to CGC specifications, using only the listed materials and components. For a complete set of specifications, email [securockroofing@usg.com](mailto:securockroofing@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 CGC Structural Panel Concrete Roof Decks on roof framing. A pallet of CGC Structural Panel Concrete Roof Decks (20 sheets, 19 mm x 1220 mm x 2440 mm [3/4" x 4' x 8']) weighs approximately 1542 kg (3400 lbs.). Do not exceed limits when loading pallets or panels on open framing or completed roof assemblies. Store units next to structural walls where the joists meet the wall.

Use a structural concrete panel screw #8 x 1-5/8" (minimum length) with a thin wafer head (or bugle) and GrabberGard® finish to attach the CGC Structural Panel Concrete Roof Decks to the cold-formed steel. For mechanically attaching the roof system, use only corrosion-resistant fasteners that are compatible with concrete.

## FASTENERS FOR COLD-FORMED STEEL

CGC recommends either of the following Grabber screws for fastening our CGC Structural Panel Concrete Roof Decks to cold-formed steel:

### Structural Concrete Panel Screw 8 x 1-5/8" with GrabberGard—Collated

<b>Item Numbers</b>	CGH8158LG, CHS8158JBWG2
<b>Size</b>	#8 (do not use a larger size unless specifically specified by the structural engineer)
<b>Minimum Length</b>	41 mm (1-5/8")
<b>Finish</b>	GrabberGard (required)
<b>Extras</b>	Winged drill, "reamer nibs" under head (for countersink)

**Note:** In accordance with PER-14076, the minimum screw pattern is 153 mm (6") o.c. along the perimeter of the panels and 305 mm (12") o.c. in the field of the panels. The structural engineer should specify the recommended pattern for each application.

## FRAMING

The steel roof 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 41 mm (1-5/8") wide with at least 19 mm (3/4") of the panel bearing on the supporting flange. Metal framing must be a minimum 16 gauge and spaced no greater than 1220 mm (48") o.c. Follow the contract documents and the steel framing manufacturer's recommendations for the proper installation and bracing of the framing.

## TRAFFIC PROTECTION

Place sheathing materials (i.e. additional layer of CGC Structural Panel or plywood) on the roof in high traffic areas to protect newly installed concrete roof decks.

## 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 CGC Structural Panel Concrete Roof Decks with the long edges perpendicular to the framing. 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. 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. **Tongue and groove joints should be fitted tightly without any gapping.** For all panels less than 610 mm (24") wide, all edges must be supported by blocking. Blocking must be cold-formed from steel complying with AISI General, with a minimum 54 mils (1.37 mm) base metal thickness (no. 16 gauge) and a minimum G60 galvanized coating. The attachment flange or bearing edge must be at least 41 mm (1-5/8") wide and at least 19 mm (3/4") of the panel must bear on the supporting flange or edge.

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 CGC Structural Panel Concrete Roof Decks, never expose the panels to direct flame for the purpose of snow removal and/or deicing efforts. At no time should salts, fertilizers or other chemicals be used on the panels for anti-icing and/or deicing purposes.

## ROOFING SYSTEM

Follow the contract documents and the roof system manufacturer's recommendations for the application of roof materials. Before the application of roof materials, ensure that all panels are properly fastened, with the fastener head driven flush or slightly below the surface of the panels.

## PRODUCT DATA

**Sizes and Packaging:** 19 mm x 1220 mm x 2440 mm (3/4" x 4' x 8') panels. Each panel weighs approximately 77 kg (170 lbs.) and is intended to be handled by two people. CGC Structural Panel Concrete Roof Deck is packaged in 20-piece units.

**Availability:** CGC Structural Panel Concrete Roof Decks are sold through CGC distributors. Please contact your local CGC Representative for additional information.

**Storage:** CGC Structural Panel Concrete Roof Decks 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 CGC Structural Panel Concrete Roof Decks 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 above 0°C (32°F) to allow the ice to melt naturally. Never physically pry panels apart. Salt, fertilizer or other deicing 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:** CGC Structural Panel Concrete Roof Decks 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 CGC Structural Panel Concrete Roof Decks that are secured following the fastening schedule prescribed in the original installation documents. The replacement panels must be a minimum of 610 mm (24") wide and must span a minimum of two supports. If not, the replacement panel must be fully blocked on all sides.

## TEST DATA

Physical and Mechanical Properties	Test Standard	Typical Values Standard (Metric)
Moment capacity (3/4" thick panel)	ASTM C1185, 5.5	1,800 lb.-in./ft. 685 Nm/m
Bending stiffness (3/4" thick panel)	ASTM C1185, 5.5	315,000 lb.-in. <sup>2</sup> /ft. (3 kN-m <sup>2</sup> /m)
Concentrated load	ASTM E661	550 lbf. (2.45 kN) static 0.108" (2.7 mm) max. deflection @ 200 lbf. (0.89 kN)
Fastener lateral resistance <sup>a</sup>	ASTM D1761, S.10.2	>210 lbf. (0.93 kN) dry >160 lbf. (0.71 kN) wet
Density <sup>b</sup>	ASTM C1185	75 lbs./ft. <sup>3</sup> (1,200 kg/m <sup>3</sup> )
Weight at 3/4" thickness	ASTM D1037	5.3 lbs./ft. <sup>2</sup> (26 kg/m <sup>2</sup> )
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)
Mould resistance	ASTM D3273 ASTM G21	10 0
Water absorption <sup>c</sup>	ASTM C1185, 5.2.3.1	<15%
Noncombustibility	ASTM E136 (unmodified) CAN/ULC S114	Passed Passed
Surface-burning characteristics (flame spread/smoke developed)	ASTM E84 CAN/ULC S102	0/0
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 #8 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.

## SYSTEM PERFORMANCE

Description	Reference
Code Reports	PER-14076
Ultimate Uniform Load <sup>a</sup>	150 psf @ 813 mm o.c. (32"). See Table
Shear Diaphragm Ratings	>19.2 kN/m (>1300 lbf/ft) <sup>b</sup>
UL 1-, 1.5-, 2-Hour Fire Resistance Designs	P561, P562
UL Roofing System, Uplift Resistance	TG1K.R25352

(a) On steel framing.

(b) Joists spaced 813 mm (32") o.c. and fasteners spaced 200 mm (8") at the perimeter and 305 mm (12") o.c. in field, fully blocked. See the Progressive Engineering Inc. Product Evaluation Report PER-14076.

## LOAD TABLE

The following table represents the allowable load-carrying capacity of CGC Structural Panel Concrete Roof Decks. For the most up-to-date load tables, see the Progressive Engineering Inc. report, PER-14076. For technical questions, email [securockroofing@usg.com](mailto:securockroofing@usg.com). **A qualified architect or engineer should review and approve the calculations for all projects.**

### Ultimate Uniform Load for CGC Structural Panel Concrete Roof Deck

Joist Spacing - mm (in.)	305 mm (12")	406 mm (16")	610 mm (24")	813 mm (32")	1220 mm (48")
Uniform Load - kPa (psf)	63.2 kPa (1,320 psf)	35.6 kPa (744 psf)	15.8 kPa (330 psf)	11.5 kPa (240 psf)	7.2 kPa (150 psf)

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

(1) **Ultimate Load Values have no safety factor included.**

(2) Two framing spans minimum per panel piece.

(3) Ultimate Uniform Load Table for general reference only.

For complete load capacities, consult Progressive Engineering Inc. Product Evaluation Report PER-14076

### PRODUCT INFORMATION

See [cgcinc.com](http://cgcinc.com) for the most up-to-date product information.

### WARNING

Dust can contain silica. Prolonged and repeated breathing of silica dust can cause lung damage and cancer. If cutting with a power tool, use a wet or vacuum saw to reduce the amount of dust generated. Dust can be corrosive to eyes, skin, and respiratory tract. Contact can cause severe chemical burns. Wear eye, skin and respiratory protection. If eye contact occurs, flush immediately with water for 30 minutes. If ingested, call physician. Product safety information: 800 387 2690 or [cgcinc.com](http://cgcinc.com).

**KEEP OUT OF REACH OF CHILDREN.**

### TRADEMARKS

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### NOTE

Products described here may not be available in all geographic markets. Consult your CGC Inc. 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/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.

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