USG Structural Solutions

USG STRUCTURAL PANEL & PANELIZED FLOOR SYSTEMS

BUILD FASTER WITH PANELIZED FLOOR SYSTEMS

USG Structural Panels are high strength reinforced concrete panels for use in noncombustible construction. When installed on a panelized cold-formed steel panelized frame, the structural system is much faster to install and significantly lighter than poured comparable concrete structural floor systems. A panelized system with USG Structural Panels is a more efficient way to build noncombustible floor and roof systems.

EVALUATION REPORT

STRUCTURAL PEFORMANCE

The USG Structural Panel installed on a panelized framing system provides great third-party certified uniformly distributed load, floor diaphragm and industry leading concentrated load capacities, as well as an ever-expanding set of FM certified wind uplift-resistance systems.

For the most up-to-date load capacity table, see:

Concrete Subfloor
- ICC ESR-1792 (see www.ESR1792.com)
- Progressive Engineering Inc. Product Evaluation Report PER-13067 (see www.per13067.com),

Concrete Roof Deck
- Progressive Engineering Inc. Product Evaluation Report PER-14076 for Concrete Roof Deck (see www.per14076.com)
- Progressive Engineering Inc. Assembly Evaluation Report AER-17108 for Roof Systems (www.aer17108.com)

DESCRIPTION	REFERENCE
Evaluation Reports	ICC ESR-1792 (DSA & OSHPOD Supplement); PER-13067; PER-14076; AER-17108
Code Approvals	LARR #25682; FL#19921; MEA #214-07-M
UL 1-, 1.5-, 2-, 3-Hour Fire Resistance Designs	G556, G557, H505, H510, H501, G602, P561, P562, and more (see www.USGStructuralUL.com for a complete listing)

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LOAD CAPACITIES

The following tables represent attainable load capacities for USG Structural Concrete Panels fastened to a cold-formed steel framed panel.

UNIFORM LIVE LOAD CAPACITIES[2]		
Span Between Supports	**Conditions**	**Total Allowable Load Capacity (PSF)[1]**
12″	Dry or Wet	512
16″	Dry or Wet	283
24″	Dry or Wet	120

Notes:

1. Live load ratings have been determined from testing based upon a minimum 120psf service live load for the 24″ span rating and a maximum panel live load deflection = L/360.
2. A factor of safety of 3.0 applied.
3. A minimum of two framing spans required per panel piece.
4. Tabulated live load ratings are valid for a service level dead load of 10psf or less.
5. See Table 3 in the *Progressive Engineering Inc. Product Evaluation Report PER-13067* (www.per13067.com) for up-to-date uniform loading capacities.

SAMPLE SIMPLE BEAM DIAPHRAGM VALUES					
Panel Type	**Support Spacing**	**Fastener Spacing**		**Blocking**	**Shear Strength**
		Perimeter	**Field**		
Subfloor	16″	4″	12″	No	1462plf
		6″	12″		1395plf
	24″	4″	12″	No	1341plf
		6″	12″		1053plf
Roof Deck	24″	6″	12″	Yes	1468plf
	48″	4″	12″	Yes	2036plf

See Table 5 in the *Progressive Engineering Inc. Product Evaluation Report PER-13067* (www.per13067.com) for complete and up-to-date simple beam floor diaphragm capacities and deflection equation.

CANTILEVER FLOOR DIAPHRAGM TESTING					
Panel Type	**Support Spacing**	**Fastener Spacing**		**Blocking**	**Shear Strength**
		Perimeter	**Field**		
Subfloor	12″	4″	12″	No	772plf
		8″			1121plf
	16″	4″		No	860plf
		8″			975plf
	24″	4″	12″	No	713plf
		8″			465plf
		6″		Yes	1148plf
Roof Deck	48″	4″	12″	Yes	1641plf
	48″	8″	12″	Yes	1098plf

See Table 6 in the *Progressive Engineering Inc. Product Evaluation Report PER-13067* (www.per13067.com) for complete and up-to-date cantilever floor diaphragm capacities and deflection equation. See Table 4 in the same report for safety factors and resistance factors for diaphragms. For technical assistance, email questions to usgstructural@usg.com.

UL-CERTIFIED FIRE DESIGNS

The USG Structural Panel fastened to a cold-formed steel floor panel can be used in multiple UL-certified fire designs with 1-, 1.5-, 2- and 3-hour ratings. These systems were all tested in accordance with ASTM E119/UL 263 and classified as a noncombustible system for floor/ceiling or roof/ceiling assemblies in accordance with active ASTM standard E136 as per the International Building Code (IBC). The table below outlines the available systems.

UL DESIGN H505 2-HOUR RATING

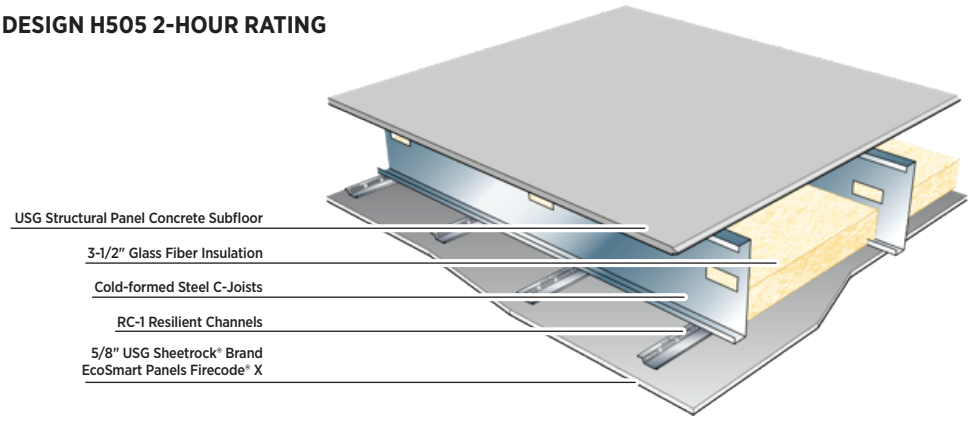
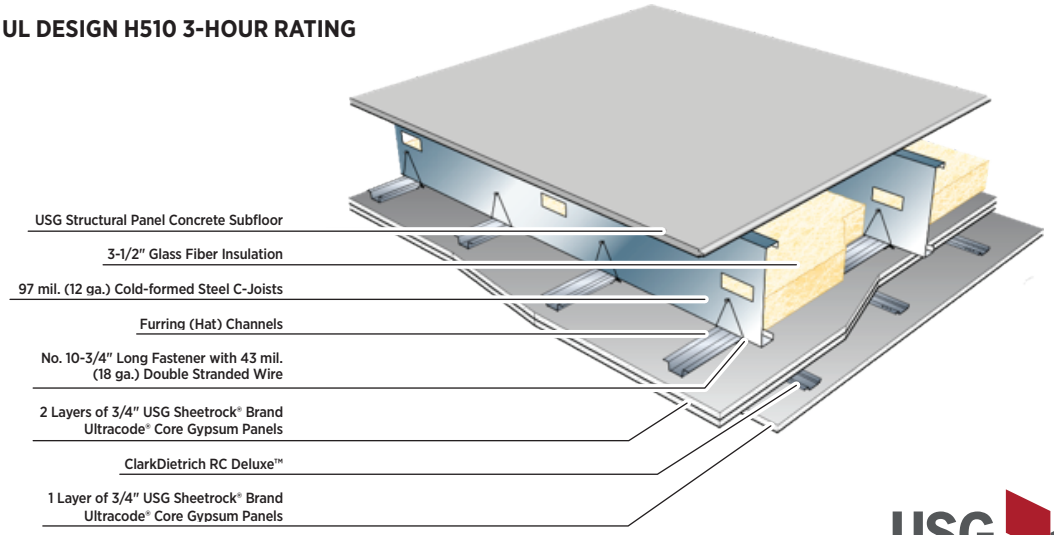


TABLE OF UL-CERTIFIED FIRE DESIGN SYSTEMS *(www.USGStructuralUL.com)*	
Floor/Ceiling Assemblies	**Fire Rating**
G556 (www.ULG556.com)	1-, 1.5-, 2-Hour
G557 (www.ULG557.com)	2-Hour
H505 (www.ULH505.com)	1-, 2-Hour
G602 (www.ULG602.com)	2-Hour
H510 (www.ULH510.com)	3-Hour
Roof/Ceiling Assemblies	**Fire Rating**
P561 (www.ULP561.com)	1-, 1.5-, 2-Hour
P562 (www.ULP562.com)	1-Hour
Panelized Assembly	**Fire Rating**
H522™ (contact sales for a copy)	1-, 2-Hour

The table above lists all the UL-certified designs in which the USG Structural Panel fastened to a cold-formed panel can be used. The development of new fire designs in ongoing, so please visit USG Structural UL-certified fire designs at www.USGStructuralUL.com for the most up-to-date list, or for technical assistance email queries to usgstructural@usg.com.

UL DESIGN H510 3-HOUR RATING



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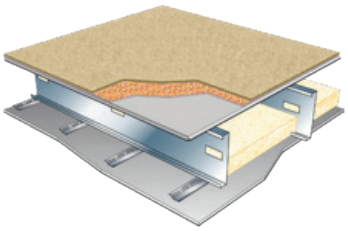
ACOUSTICAL PERFORMANCE

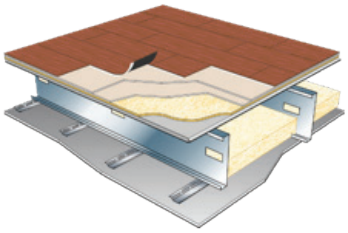
The USG Structural Panel fastened to a c-joist framed panelized system achieves above the code minimum STC 50 value without any floor coverings. The UL-certified 2-hour design H505 attains a bare value of 54. Values recorded by following the Sound Transmission Coefficient (STC) when tested in accordance to ASTM E90, and Impact Isolation Class (IIC) when tested in accordance with ASTM E492.

The following table represents the attainable sound rating and premium sound ratings for a panelized cold-formed steel c-joist framing system sheathed with USG Structural Panel Concrete Subfloors. For the most up-to-date acoustical information see your local USG Structural Sales Representative. For technical questions, email usgstructural@usg.com.

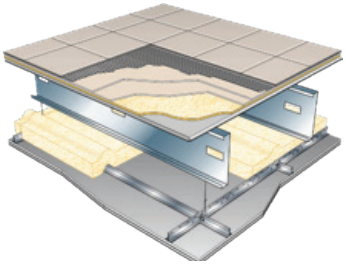
Base – Carpet & Pad



Improved – LVT



Greater Sound Value



2-HOUR RATED SYSTEM – H505				
Floor Coverings	**Base Sound Ratings**		**Improved Sound Ratings**	
	STC	**IIC**	**STC**	**IIC**
Bare Floor	54	27	58	32
Carpet & Pad	56	71	57	72
Carpet ONLY	55	51	59	54
Sheet Vinyl	56	51	59	56
Padded Sheet Vinyl	57	56	59	56
VCT	58	51	60	56
LVT	57	51	60	56
Laminate (Pergo)	57	51	60	54
1/2" Wood Floor	57	51	59	55
Ceramic Tiles (12"x12")	58	54	61	57

Base Sound Ratings are with a single layer of USG Sheetrock® Brand EcoSmart Panels Firecode® X on 1/2" resilient channels. Improved Sound ratings were tested with two (2) layers of USG Sheetrock® Brand EcoSmart Panels Firecode® X fastened to 1/2" resilient channels. In all cases, two layers 1/4" Fiberock Underlayment Panels with joints staggered were used under floor coverings and layered over either Kinetics Soundmatt or Pliteq Genie RST02 sound isolation mats, all supported by the USG Structural panel.

Greater sound values are attainable with alternative ceiling construction and alternative sound mats. Please contact your local USG Structural representative or email us at **usgstructural@usg.com**.

The complete *USG Structural Fire & Acoustic Manual* (SCP100) is available at **www.SCP100.com**.

RECOMMENDED FASTENERS

Refer to ***USG Structural Recommended Fasteners*** **(SCP95)** for the most current fastener recommendations for installing USG Structural Panel Concrete Subfloor. The recommended fasteners meet several criteria to insure they have adequate pull-out, pull-through, and slip performance. These fasteners also meet or exceed 1000 hours corrosion resistance when tested in accordance with ASTM B117. High corrosion resistance is critical because of the panel pH level. When coupled with any moisture exposure, including high humidity, this elevated pH may deteriorate a non-corrosion resistant fastener.

Panel Framing	Min. End Distance	Min. Flange Width	Fastener Manufacturer	Part Number	Fastener Description
54-97 mil. (16-12 ga) C-Joists	1/2" [13mm]	1-5/8" [41mm]	Grabber Construction Products, Inc.	CGH8158LG	#8 x 1-5/8" Winged Flat Wafer Head Self-Drilling Screw
			Simpson Strong-tie Company, Inc.	CBSDQ158S	#8 x 1-5/8" Winged Self-Drilling Screw

CUTTING & FASTENING

Efficiently cutting and fastening USG Structural Concrete Panels requires the proper tools and accessories. These are suggested tools for use in applying USG Structural Panels. USG recommends that you review and follow all manufacturer guidelines for the use and care of any tools used to install our products and accepts no responsibility for their use or warranty. Model numbers subject to change by tool manufacturers. The recommendations provided are based on the control of dust during the cutting of the panels.

OSHA Respirable Crystalline Silica Standard for Construction - Rule 29 CFR 1926.1153
As the cutting of our product is not covered in Table 1, USG recommends that a competent person develop a written exposure control plan and follow the steps to determine the exposure potential of workers and the control plan methods.

Steel Framing: Stand-up style, 2500 RPM or less variable speed screw gun is recommended. Do not use dry or wet lubricants in the drive head mechanism of stand-up drivers. Remove dust frequently with dry, clean compressed air, such as canned air.

Stand-Up driver examples
- Grabber® SuperDrive® 75
- Simpson Quik Drive® Pro250

For straight cuts, use a hand held circular saw with a carbide-tipped framing blade. A diamond or other specialty blade is not required.

Blade examples:
- Diablo D0724X – 7-1/4", 24 T Carbide-Tipped
- Makita T-01426 - 6-1/2", 24 T Carbide-Tipped

Per OSHA Rule 29, saws used outside with blades 8" or less must be equipped with a dust collection port and a VDCS (vacuum dust collection device) rated at over 80 cubic feet per minute with a 99% or greater filter efficiency. For improved control of dust use a HEPA filter on the vacuum.

Circular saw examples:
- Makita – 5057KB 7-1/4" (Corded)
- DeWalt – DWS520K 6-1/2" Track Saw (Corded)
- SkilSaw – SPT67FMD-01 7-1/4" (Corded)

VDCS examples:
- Makita - VC410
- DeWalt – DWV012

For making small openings, use the appropriate size hole saw or rotary tool with dust collector port and VDCS.

Hole saw examples:
- Milwaukee 49-56-3003 Carbide Tipped Hole Saw
- Diablo Tools DHS3000 Bi-Metal Hole Saw.

Rotary tool examples:
- Roto-Zip XB-UL1, WD1, XB-TC1

ADDITIONAL TOOLS

For anchoring systems into the USG Structural Panel Concrete Subfloor, see Code Report PER-13067, Table 7 available at **www.per13067.com**.

For the complete list of tools, including fastening system required bits, please visit **www.USG.com** and search for *USG Structural Panel Tools* (SCP96).

CONTACT INFO

Review our **Contact Map (SCP70)** to identify the USG Structural Panel business manager in your area or email queries to **usgstructural@usg.com**.

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

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

DANGER
The following are warnings when installing the panels. 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 of 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 atusg.com.
KEEP OUT OF REACH OF CHILDREN.

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

USG.4YOU
800 (874-4968)
usg.com/structural

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

MSRP based upon full truckload delivered to jobsite:
Subfloor: $4.50/sf
Roof Deck: $5.40/sf

SCP99-USA-ENG/rev. 8-20

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