Design Outside the Lines

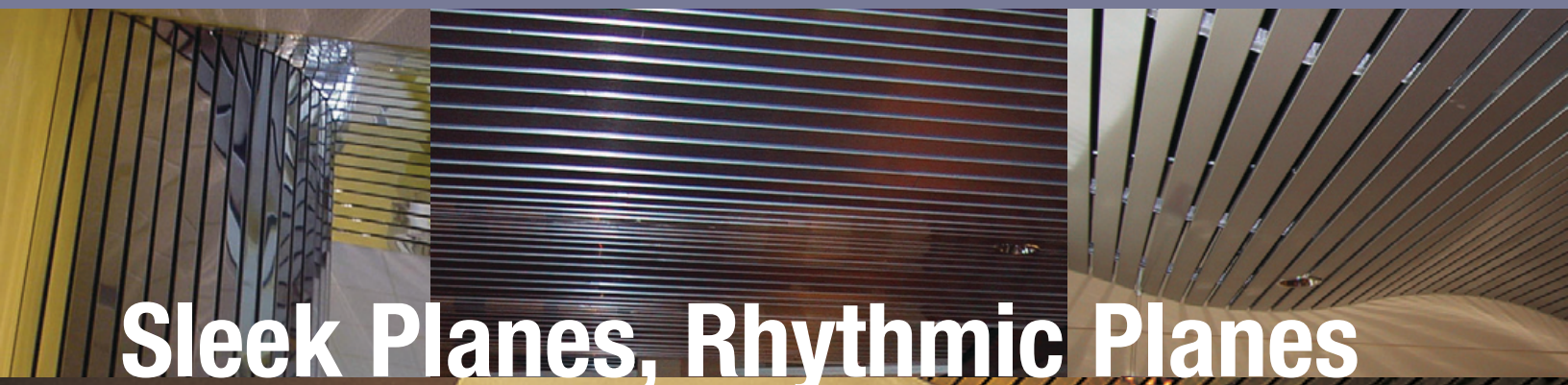
USG

Paraline®

Linear Metal Ceiling System

- Offices
- Lobbies
- Conference Rooms
- Schools
- Retail
- Hospitality
- Entertainment

The PARALINE® Linear Metal Ceiling System combines elegant linear pans and a specially engineered suspension system to create dynamic ceilings with clean, contemporary planes or gently rolling waves. Use the system to enhance visual impact in retail, hospitality, entertainment, office and transportation environments.



Sleek Planes, Rhythmic Planes

User's Guide

Use this brochure to specify PARALINE Linear Metal Ceiling System, and create a signature touch that integrates easily with standard acoustical ceiling systems. Inside, you'll find comprehensive information about system components, lighting and utility options, design ideas, and guide specifications.

Paraline®
Linear Metal Ceiling System

Pans

The PARALINE ceiling is a system of 12′ long linear aluminum pans. To accommodate a range of applications, three pan systems have been developed.

PARALINE I	Features 3-1/4″ wide pans with roll-finished edges. Assembled, the pans provide an open reveal for excellent sound control, using acoustical material in the plenum.
PARALINE II	Pans are 3-1/4″ wide with integral flanges that overlap to form a reveal closure appropriate for exterior soffit applications.
PARALINE III	Features bolder 7-1/4″ wide pans for larger-scale applications. Pans have a roll-finished edge to provide the same open reveal as PARALINE I with similar acoustical control.

Suspension Systems

PARALINE ceilings are suspended from structural elements using either the economical PARALOCK® suspension system or an aluminum Symmetrical Carrier. For special applications such as attaching pans to an existing suspension system, flat ceilings or radius designs, other carrier system components are available.

Air Distribution

Air distribution components for the PARALINE ceiling system are designed to integrate with the suspension systems and pans.

Lighting

The PARALINE ceiling system is compatible with standard lay-in fluorescent (“G” Type), recessed incandescent and HID downlight fixtures.

Performance

PARALINE systems offer several design features to meet specific architectural requirements including:

Fire Ratings

The system includes components engineered and tested to achieve two- or three-hour fire rating assemblies in accordance with U.L. designs D218, P230, P267.

Sound Control

Depending on the type of Paraline pan selected (open or closed reveal; perforated or unperforated) and amount of acoustical material used as overlayment, the Paraline ceiling system is capable of providing excellent noise reduction performance.

Wind Load Strength

Paraline I and Paraline II have been successfully tested with dynamic wind loads of up to 120 mph. Paraline II was further tested to withstand negative (downward) wind load pressure of up to 99 mph.

System Overview

The Paraline Linear Metal Ceiling System is comprised of 12′ long linear aluminum pans offered in widths of 3-1/4″ and 7-1/4″ with roll-finished edges for an open reveal between pans. A variant of the 3-1/4″ pan is offered with integral flanges that overlap to form a closed reveal appropriate for exterior soffit applications.

Pan Product Information

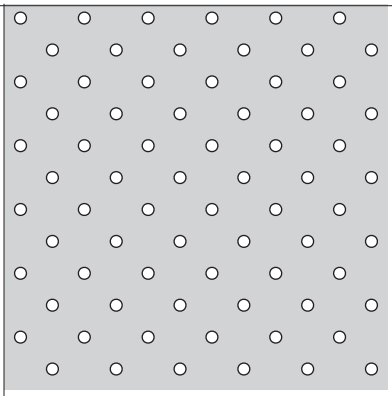
Materials

Aluminum is standard; steel is optional.

Finishes

Painted colors: Flat White, Silver Satin, Metallic Oyster, Metallic Copper, Metallic Gold; also available in polished aluminum and brushed aluminum. Perforations available: Paraline I and II in painted colors only. See Color Selector on the inside back cover.

Paraline II Perforation Pattern



Round—1/16″ perforations
.235 o.c., 5% open reveal
(Perforation shown at actual size)

Typical Sizes

3-1/4″ x 12′
7-1/4″ x 12′
Lengths less than 12′ are available

System Profile

Paraline I

Paraline I ceilings use 3-1/4″ wide pans with roll-finished edges. Once assembled, the pans provide an open reveal for excellent acoustical control (sound is absorbed by acoustical material in the plenum).

Paraline II

Paraline II ceilings maintain the 3-1/4″ wide pan dimension, but are constructed with integral flanges that overlap to form a closed reveal appropriate for exterior soffit applications.

Paraline III

Paraline III ceilings have bolder, 7-1/4″ wide pans for larger scale applications. Pans have a roll-finished edge to provide the same open reveal as Paraline I with similar acoustical control.

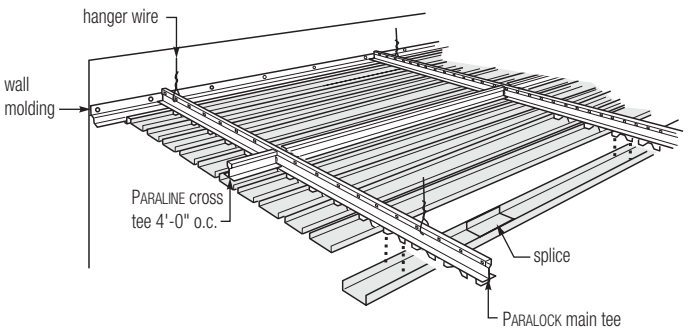
Carriers

Type	Interior	Exterior
Interior Paralock Tee System (steel)	•	
Aluminum Symmetrical Carrier	•	•
Aluminum Flat Channel Flexible Carrier	•	•
Renovation Carrier (steel)	•	

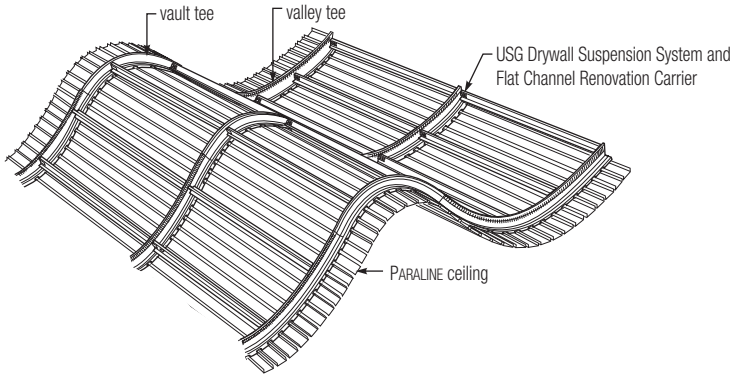
System Overview

Assembly

Flat



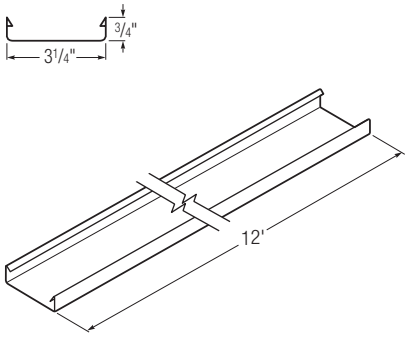
Curved



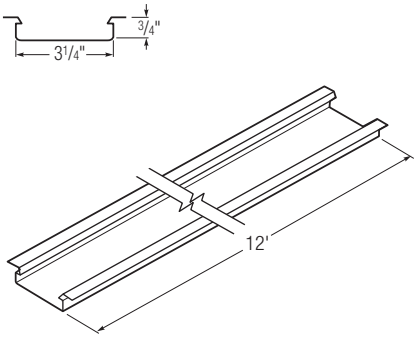
System Components

Pans

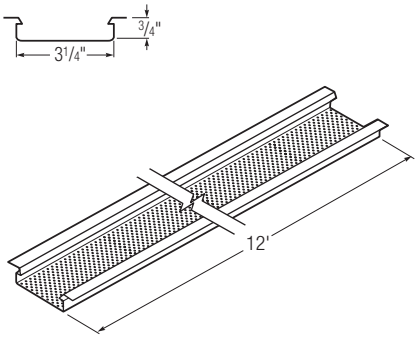
Paraline I – Unperforated



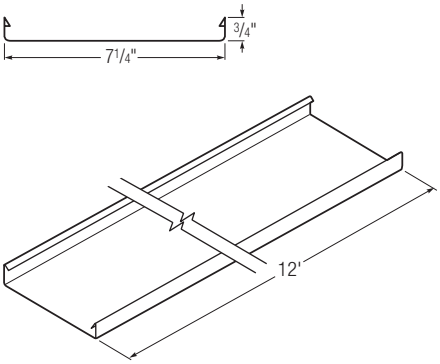
Paraline II – Unperforated



Paraline II – Perforated



Paraline III

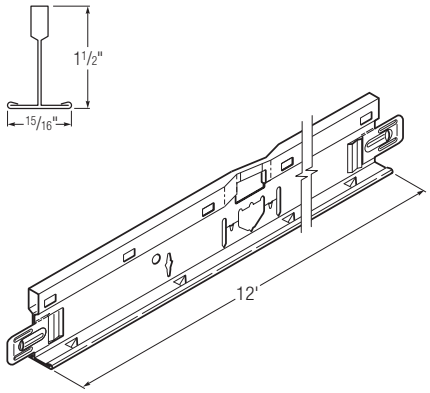


System Components

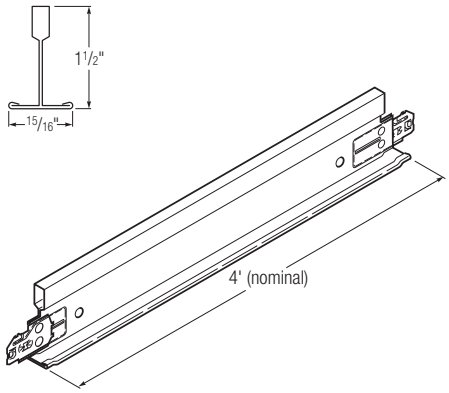
Suspension Systems

PARALOCK Fire-Rated and Non-Fire-Rated Applications

PARALOCK Main Tee

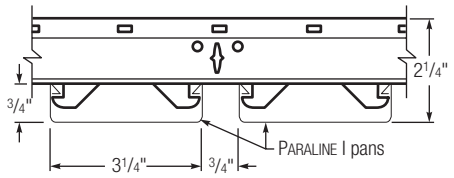


PARALINE 4′ Cross Tee

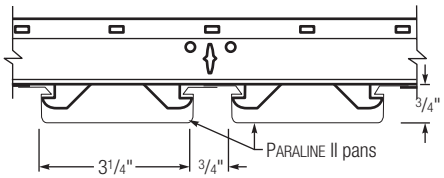


PARALOCK Main Tee Carrier Applications

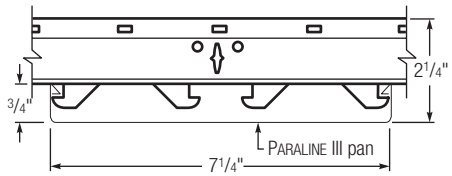
PARALINE I



PARALINE II



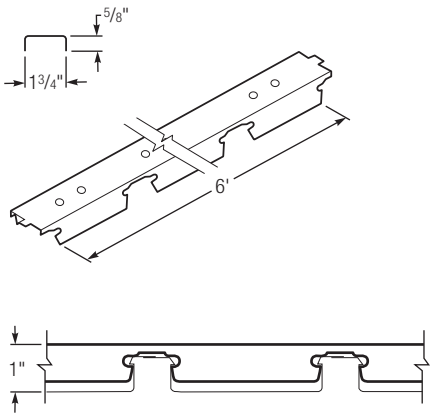
PARALINE III



PARALINE Non-Fire-Rated Suspension Carriers

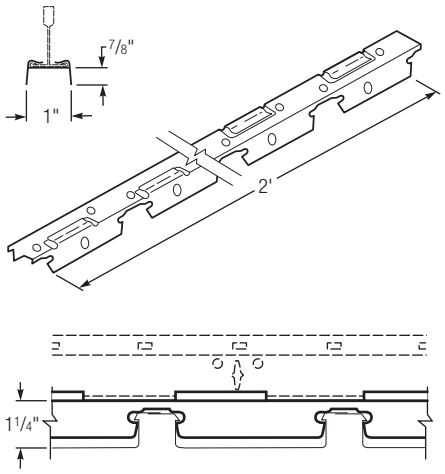
Flat Channel

For use with 15/16″ or 1-1/2″ susepnsion systems.
Use for furred or curved application.

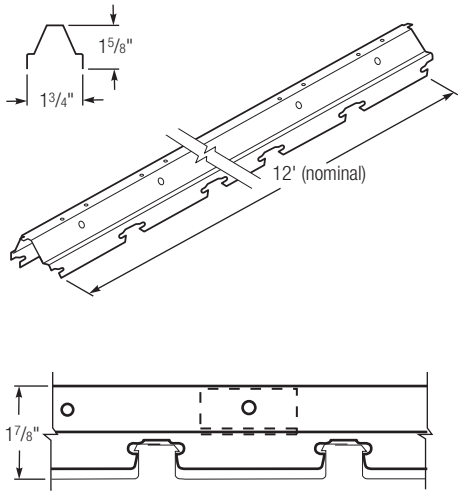


Renovation Carrier

For use with 15/16″ susepnsion systems only.
Assembly: Rotate onto existing grid and locate end to end.

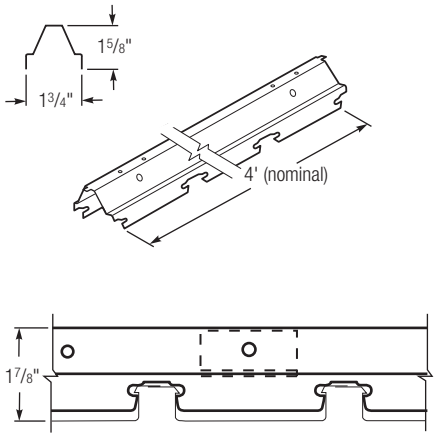


Symmetrical Carrier



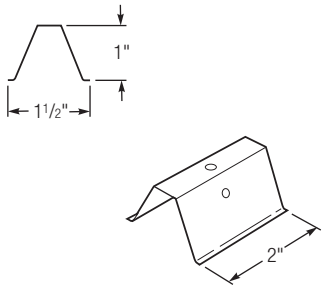
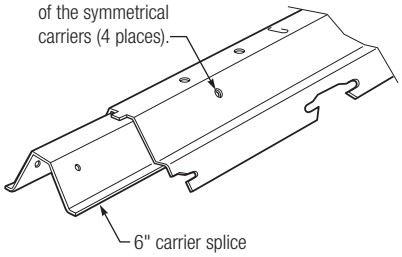
Expansion and Contraction Carriers

Expansion Carrier
Increases the space between pans by 0.125″ to allow use of a full pan at the perimeter.
Contraction Carrier
Decreases the space between pans by 0.094″ to allow use of a full pan at the perimeter.



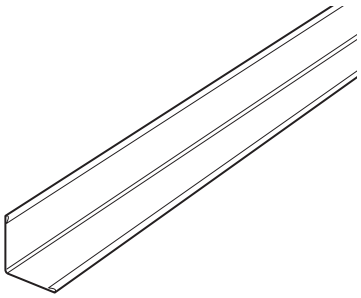
System Components

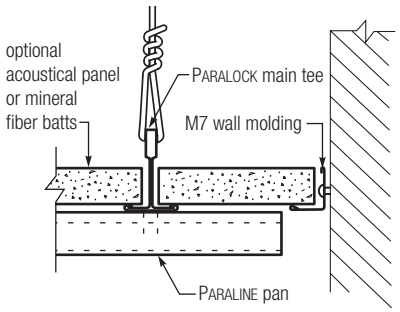
Suspension Systems

Hanger Reinforcement Clip	Symmetrical Carrier Splice
Must use with symmetrical carrier in all exterior or unusual load conditions. 	**Assembly:** screw-fasten the carrier splice to the abutting ends of the symmetrical carriers (4 places). 

M7 Angle Molding

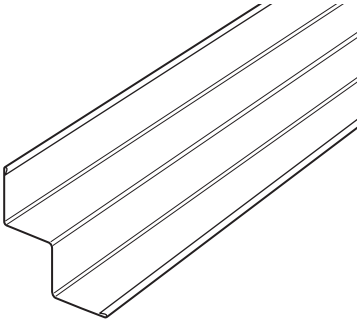
Use to establish a reveal at pan ends perpendicular to a perimeter wall.

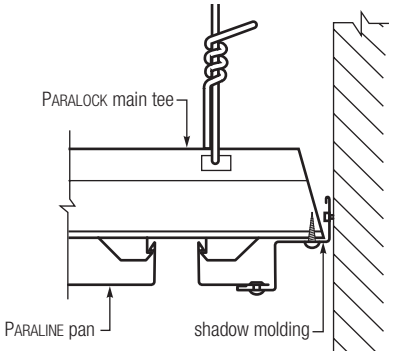




Shadow Molding

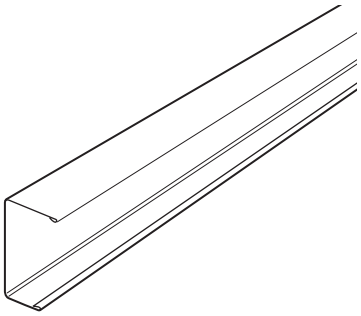
For use with cut pans to maintain a consistent reveal. Also consider using Tee Converter Clips to adjust module spacing to allow full pans at the wall. (See page 10.)

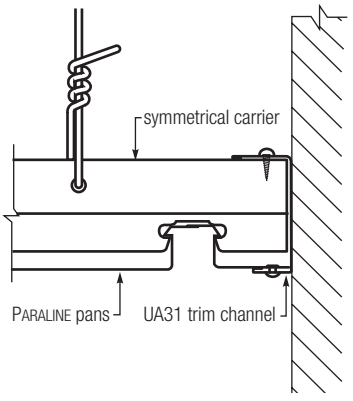




Trim Channel

Used primarily on exterior applications to trim pans at perimeter. Also consider using Expansion Carriers or Contraction Carriers to adjust module spacing to allow full pans at the wall.





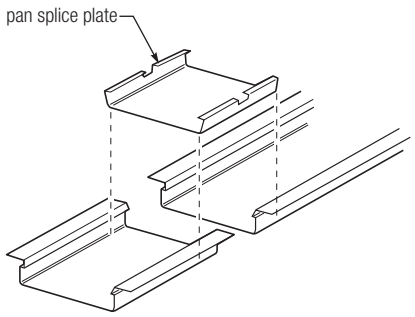
System Components

Accessories

Splice Plates

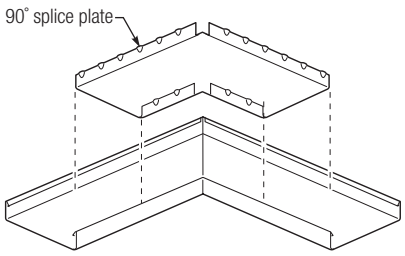
Pan Splice Plate

For use with PARALINE I and PARALINE II pans.



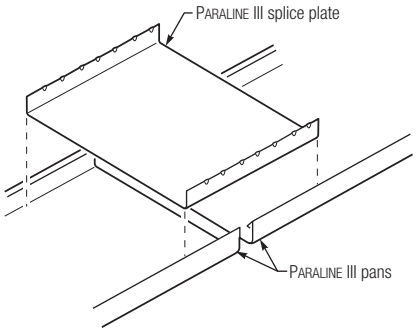
90° Splice Plate

For use with PARALINE I and PARALINE II pans.
Assembly: Snap splice into pan and close joint.



Paraline III Splice Plate

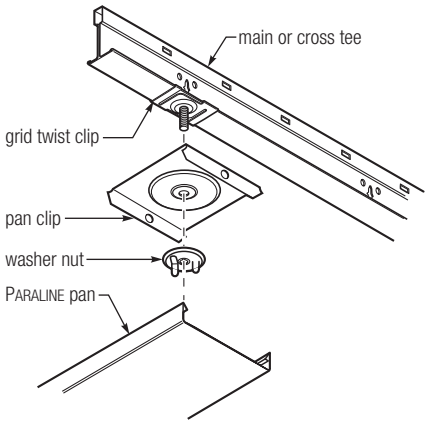
For use with Paraline III pans only.



Attachment Accessories

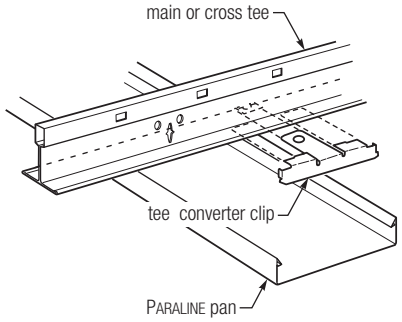
Rotating Pan Clip

Use with PARALINE I and II pans on standard suspension system in existing construction or for special situations where pans do not run parallel with each other, as in converging pan patterns or irregular areas.
Assembly: Twist grid clip onto tee flange. Attach pan clip and washer onto clip stud. Rotate pan clip to desired angle and tighten.



Tee Converter Clip

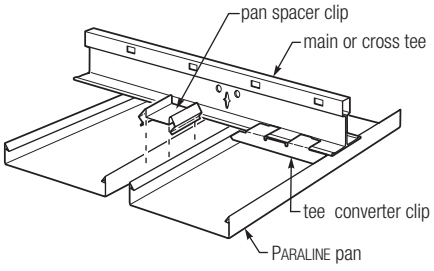
Permits PARALINE I and II pans to be assembled on conventional 15/16" suspension system. Also useful for spacing pans at any desired location.
Assembly: Slide clip onto tee face and bend ear tab over opposite side of face.



Attachment Accessories

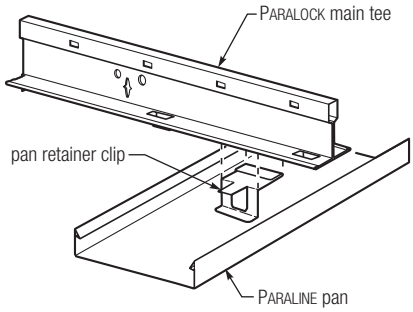
Pan Spacer Clip

PARALINE I and PARALINE III pans only. Use to establish correct spacing between pans in applications where spacing is not maintained by the suspension system, such as when using Tee Converter Clips or Rotating Pan Clips. Also use to prevent pans from shifting longitudinally, such as in access doors where short lengths of pan cannot be spliced with longer lengths.
Assembly: Install by pushing down over side edges of pans.



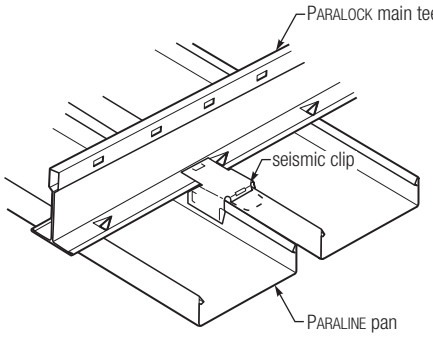
Pan Retainer Clip

Use with PARALOCK main tee anyplace pans could be dislodged by twisting or impact blows, such as in school gymnasiums.
Assembly: Slide clip onto tee face and bend ear tab over back of tee.



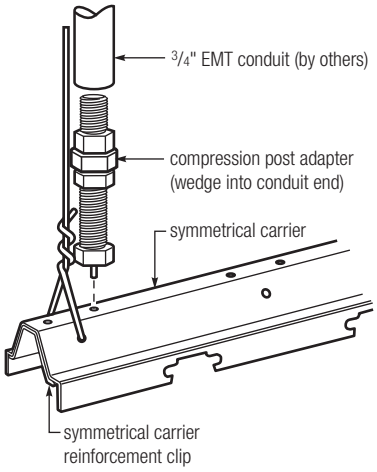
Seismic Clip

For PARALINE I and PARALINE III pans only. Use in geographic locations with specific seismic constructruction requirements or in areas subject to severe vibration to restrict movement of pans.



Compression Post Adapter

For use with 3/4″ EMT conduit for wind-load bracing.
Assembly: Wedge adapter into end of conduit. Insert pin into top of carrier and rotate adapter to apply tension to hanger wire. Tighten lock nut.



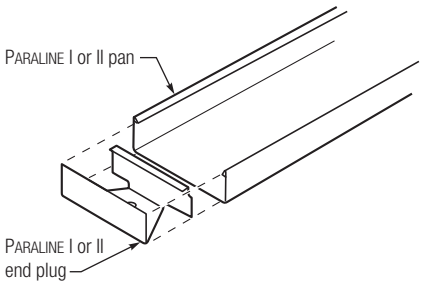
System Components

Trim

End Plugs

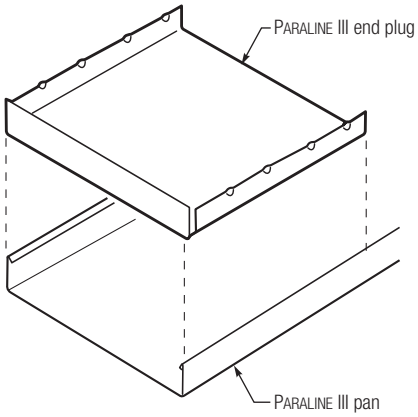
PARALINE I and II

Use to finish visible pan ends.
Assembly: Use with either PARALINE I or II pans. Push gently into end of pan and bend rear flange up to lock in place.



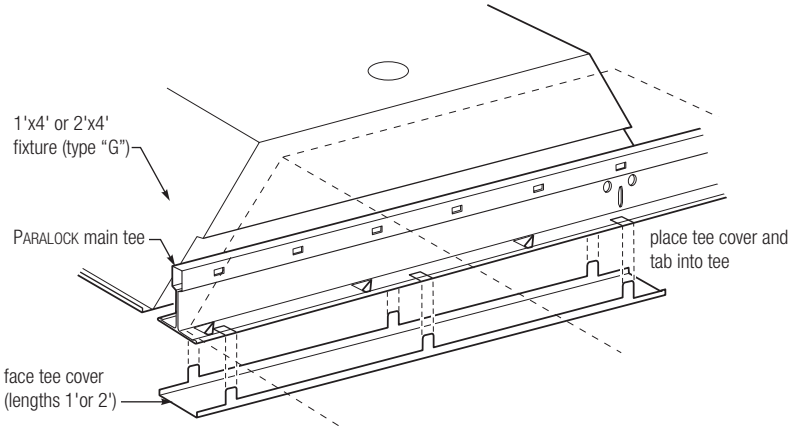
PARALINE III

Use to finish visible pan ends.
Assembly: Use with PARALINE III pans. Snap into pan from the top and align with end.



Face Tee Cover

Use to cover PARALOCK tabs on exposed main tee between two standard light fixtures installed end-to-end.
Assembly: Fold PARALOCK tabs flush with main tee face. Place tee cover over tee face and bend ear tabs over back side.

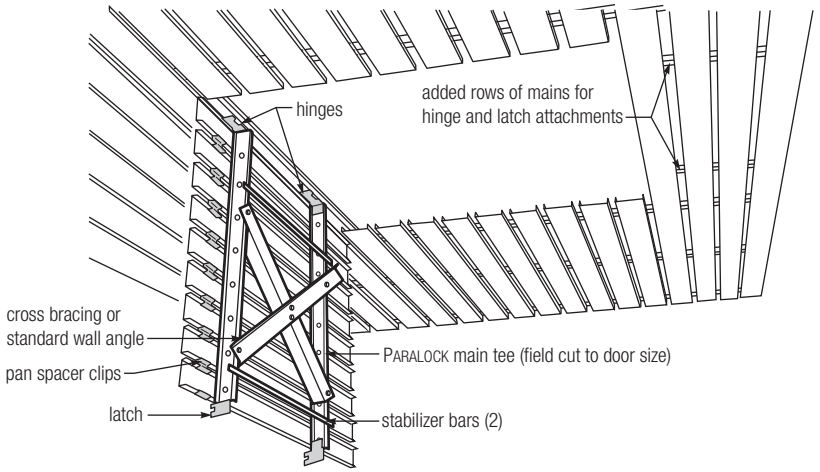


Access Door Kit

Upward/Downard

PARALOCK Main tee

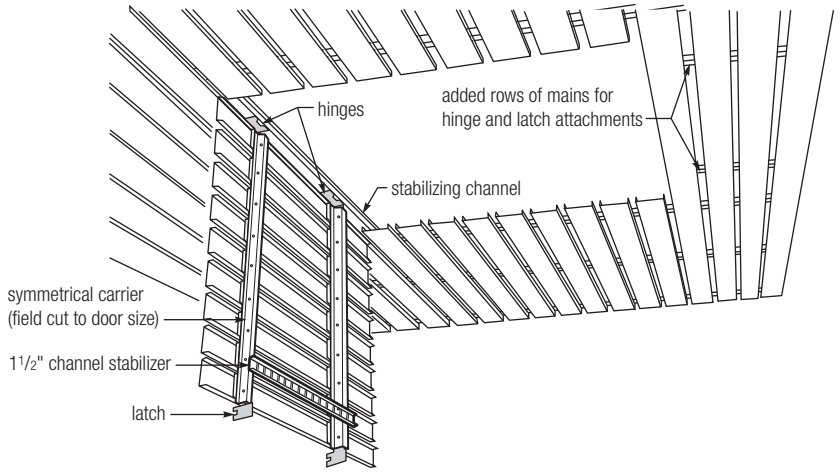
Assembly: Instructions provided with each access door kit. Each kit contains: hinges, latches, stabilizers and pan spacer clips.



Downward

Symmetrical Carrier

Assembly: Instructions provided with access door kit for on-site fabrication using additional PARALINE components. Each kit contains: hinges, latches and 1-1/2″ channel stabilizers.



System Components

Air Diffuser

PARALINE
Air Diffuser

PARALINE standard air boots with one- and two-directional air-deflecting labyrinths are designed for use with PARALINE ceiling systems, using the reveal between pans for air distribution. Assemblies snap onto pans above the ceiling line, concealed from view. Air boots are available in two-, three-, four, six- and eight-slot configurations to meet various air volume and distribution needs.

To use air-handling equipment with PARALINE II pans, the flanges must be trimmed to open the reveal.

For in-depth technical performance data and other important information, see Air Handling Performance (literature item IC471) For information on fire-rated air diffuser assemblies, see page 30.

Standard Features

- Lined with 1/2″, 1-1/2 lb. density glass fiber insulation for acoustical performance and thermal insulation.
- Air boot supported by PARALINE suspension system for simple, easy installation.
- Resilient gasketing around base of boot prevents air leakage.
- One- and two-directional configurations available.

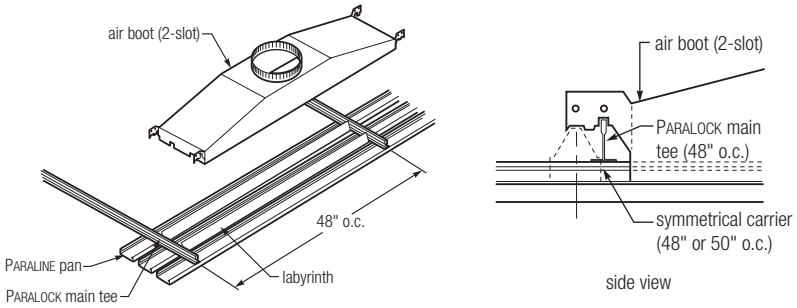
Options

- Alternative collar sizes available for each boot.
- Butterfly damper in collar.
- Face-operable collar damper.

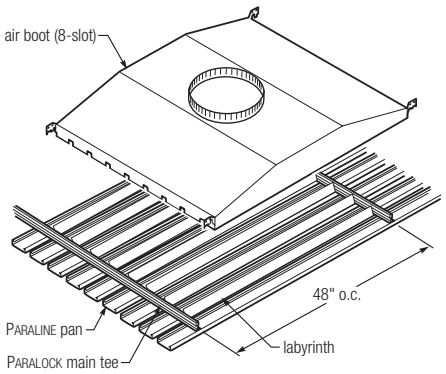
Air Boot	Collar Sizes	Air Distribution
2-Slot	6″, 7″, 8″	8-in. collar delivers 320 CFM at 35 NC and 0.10 WG static pressure.
3-Slot	8″, 9″, 10″	10-in. collar delivers 410 CFM at 35 NC and 0.07 WG static pressure.
4-Slot	8″, 10″, 12″, 14″	12-in. collar delivers 550 CFM at 35 NC and 0.10 WG static pressure.
6-Slot	10″, 12″, 14″	14-in. collar delivers 725 CFM at 35 NC and 0.08 WG static pressure.
8-Slot	12″, 14″, 16″	16-in. collar delivers 850 CFM at 35 NC and 0.07 WG static pressure.

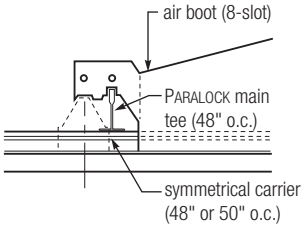
Air Boot

2-Slot



8-slot

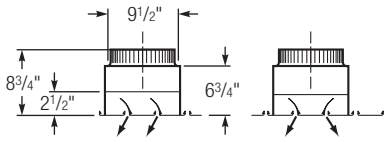




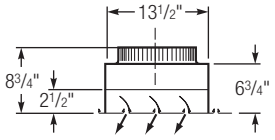
side view

Air Boot Size

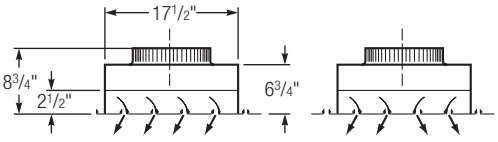
2-Slot



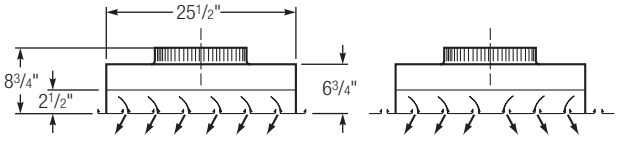
3-Slot



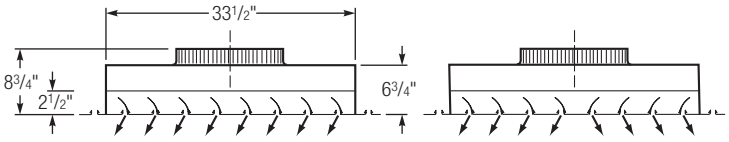
4-Slot



6-Slot



8-Slot



Note: Air handling for fire-rated construction requires the specially designed air boot shown on page 27 and 28. For more information, refer to fire-rated details on pages 26-28).

System Components

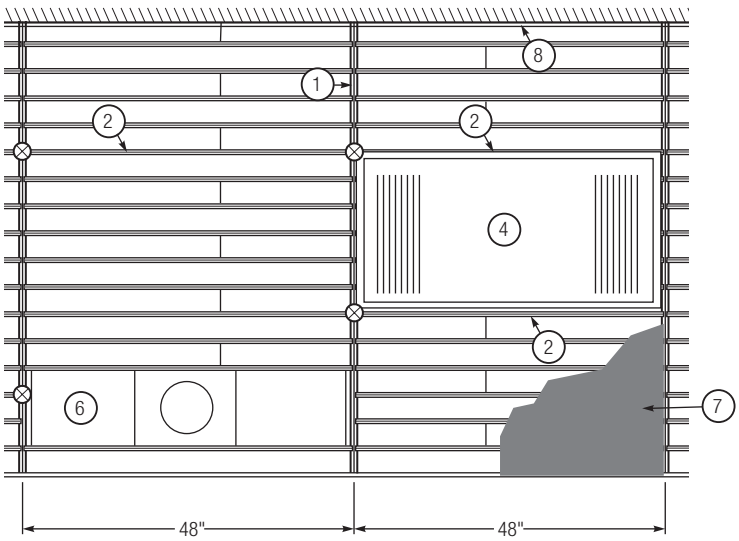
Lighting

Light Fixtures

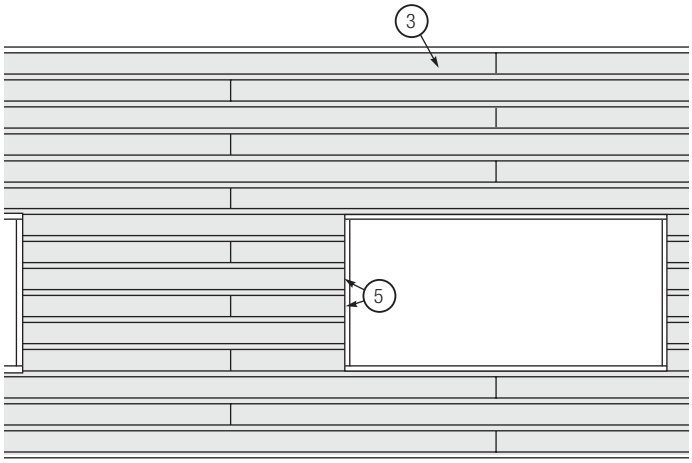
The PARALINE ceiling system is compatible with standard lay-in, recessed incandescent and HID downlight fixtures.
Note: Light fixtures are not manufactured or distributed by USG. For photometric data, electrical and mechanical specifications and specific installation instructions, refer to the light fixture manufacturer.

Type "G" Lay-In Light Fixture

View from above



View from below



Components Exposed Surface Hanger Locations

1. PARALOCK Main Tee
2. Cross Tee
3. PARALINE I, II or III Ceiling Pan
4. Type "G" 2′ X 4′ Lay-In Light Fixture
5. End Plug
6. PARALINE Air Boot
7. Black-Faced Acoustical Material (optional; not a USG product)
8. Wall Angle

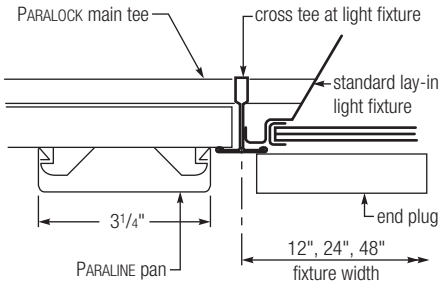
Standard Light Fixtures

Traditionally, locating lay-in lighting fixtures close to the underside of a flat ceiling system could cause unfavorable visual effects. With the PARALINE Metal Ceiling System, this is not a concern because the uniformly spaced reveals between pans creates a striking and attractive appearance.

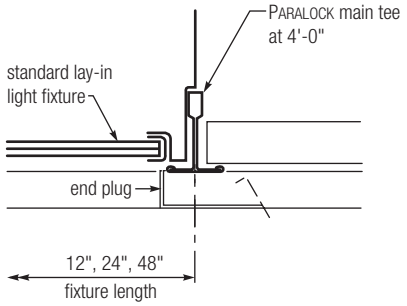
PARALINE ceiling system installed on PARALOCK carriers can accept a variety of types and sizes of standard lay-in lighting fixtures including: 1' x 4', 2' x 4', 2' x 2', 4' x 4'.

PARALOCK Carriers with Type "G" Fixture

Side

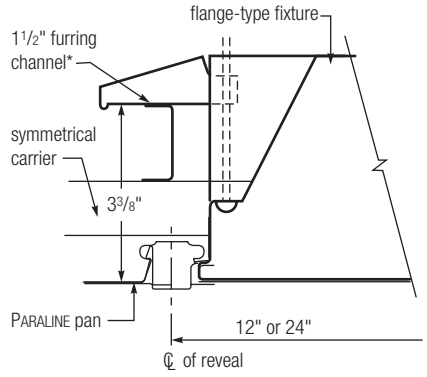


End

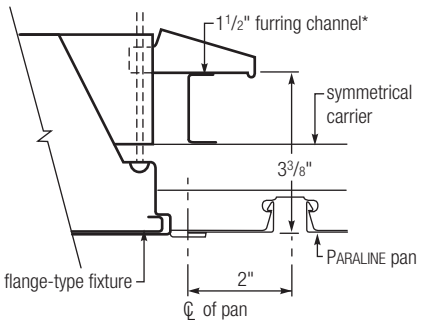


Symmetrical Carriers with Type "F" Fixture

Full Pan



Cut Pan



*Not a USG product.

System Components

Lighting

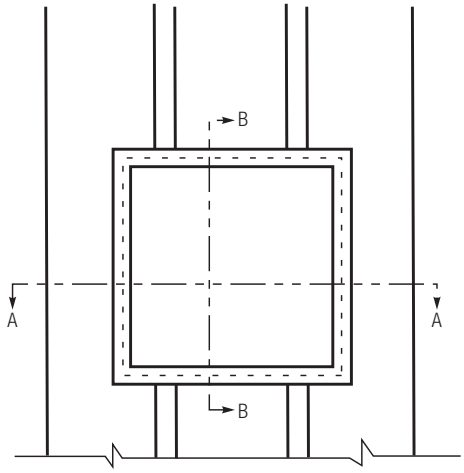
Incandescent and HID Downlights

Depending on the type, design and installation, downlights can provide either concentrated illumination for dramatic effect or brightly light a space overall. A variety of recessed incandescent and high-intensity downlights can be used with PARALINE ceiling systems. Many fit by simply cutting and removing a section of one or two pans, while some larger fixtures may require additional cuts in adjacent pans.

Downlights should have a mounting bracket that will fit into a furring channel and a flange or trim ring to cover any cuts in the surrounding PARALINE pans. Furring channels should be placed perpendicular to and extend 6″ beyond the carrier on each side of the fixture. Fixtures with non-symmetrical loading may require tie wires for connecting with the carrier. Refer to the loading chart for the carrier being used.

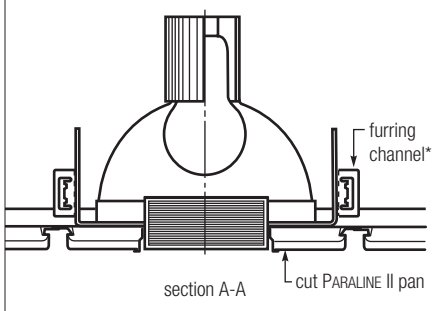
With the exterior symmetrical carrier, most standard flange-type fixtures are compatible. Additional hardware, such as 1-1/2″ furring channels (not a USG product), may be required for fixture support as shown here.

Plan View

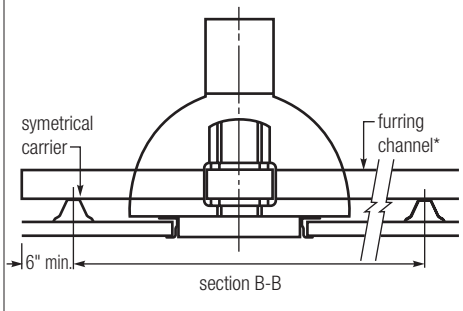


Sections

Flange-type fixture mounted centered between two pans cut longitudinally.



Flange-type fixture mounted with either three or six complete pans removed.



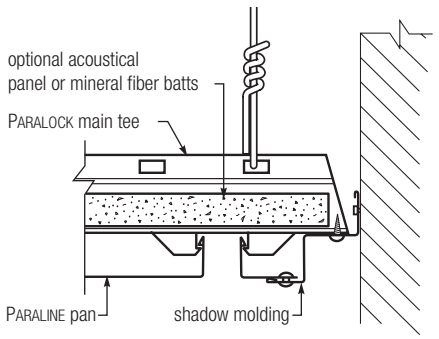
*Not a USG product.

System Applications

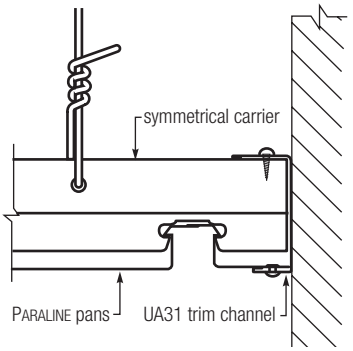
Interior Construction

Pan Parallel to Wall

Cut Pan at Perimeter Wall

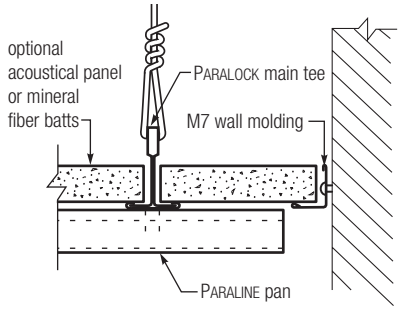


Trim Channel

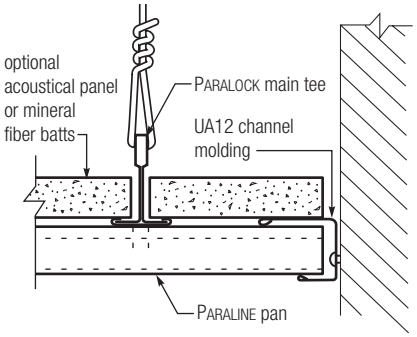


Pan Perpendicular to Wall

Revealed Pan Ends at Perimeter Wall



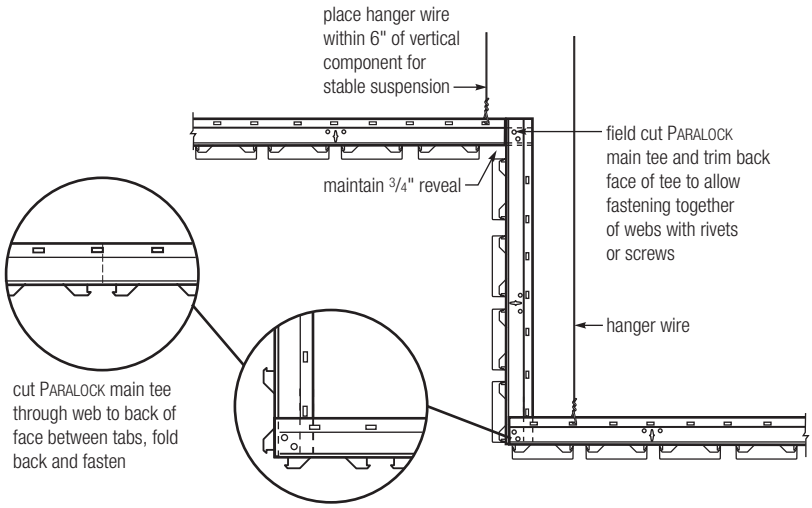
Lay-On Pan at Perimeter Wall



90° Change in Direction

Horizontal to Vertical

Suspended



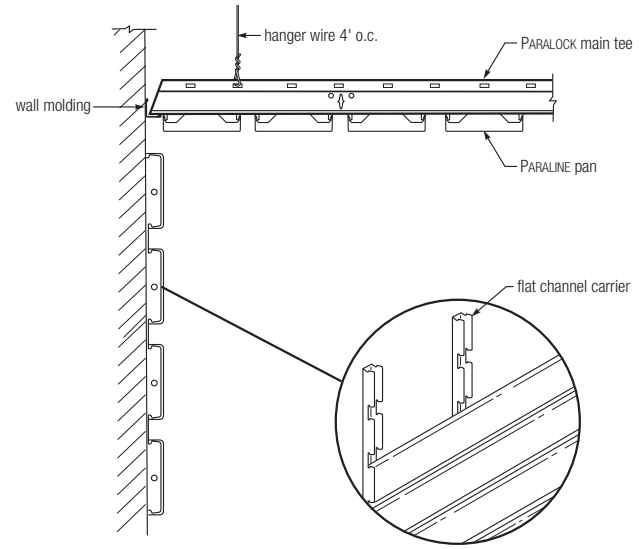
System Applications

Interior Construction

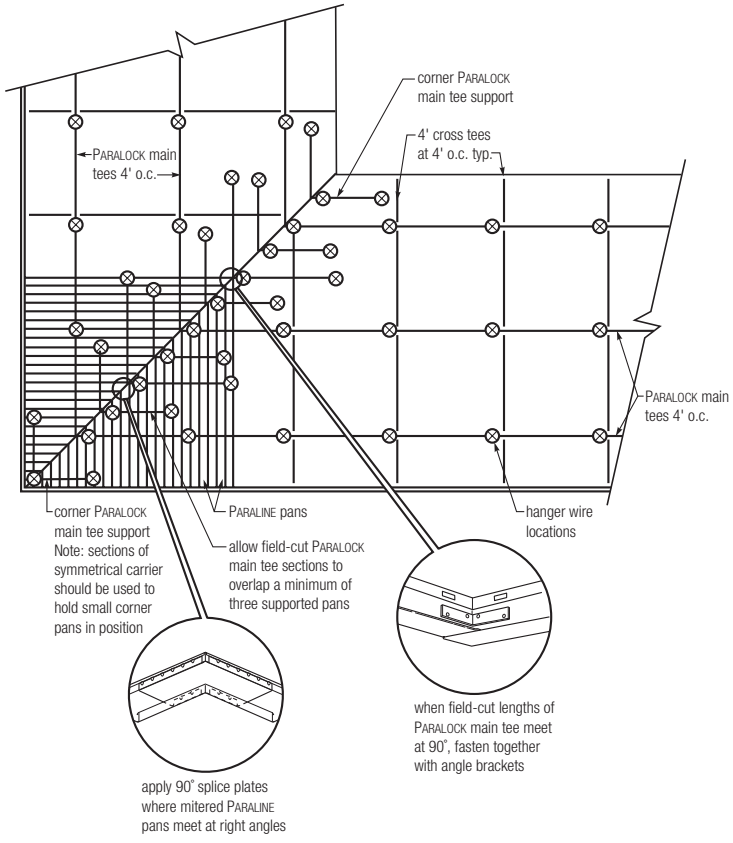
90° Change in Direction

Horizontal to Vertical

Furred



Horizontal Plane

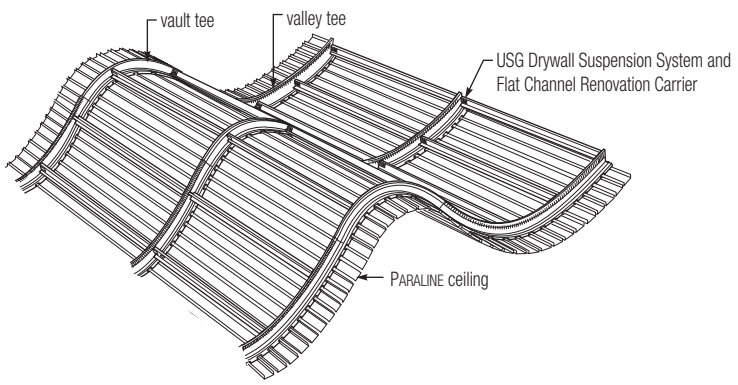


Curved/Radius Construction

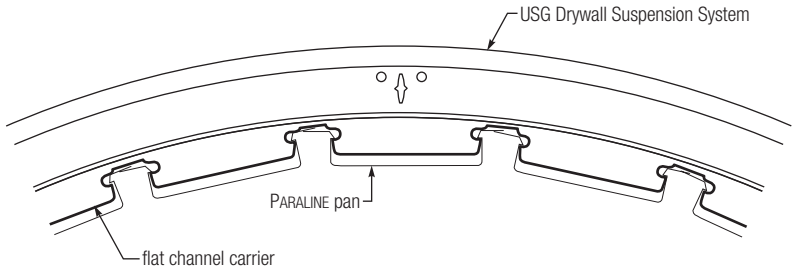
Curved sections can be fabricated three ways:

1. By using the USG Drywall Suspension System, which can be manufactured to almost any radius (below);
2. By cutting and forming PARALOCK main tees in the field (page 22); or
3. With symmetrical carriers and flat channel carriers (page 23).

USG Drywall Suspension System



Detail



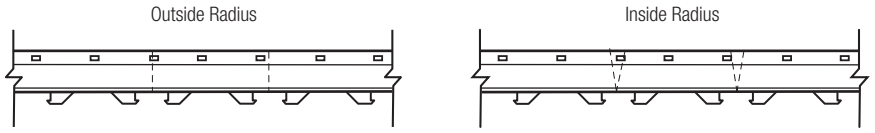
System Applications

Curved/Radius Construction

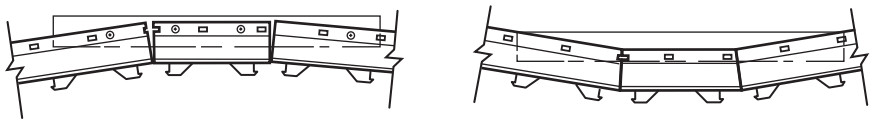
PARALOCK Main Tee

Cutting and Forming PARALOCK Carrier

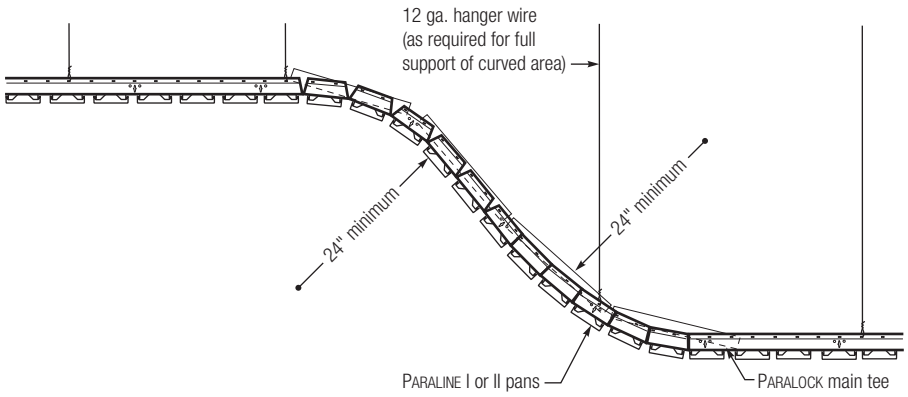
1. Cut web with tin snips between tabs at desired points.



2. Bend to desired radius and secure with splice and screws.

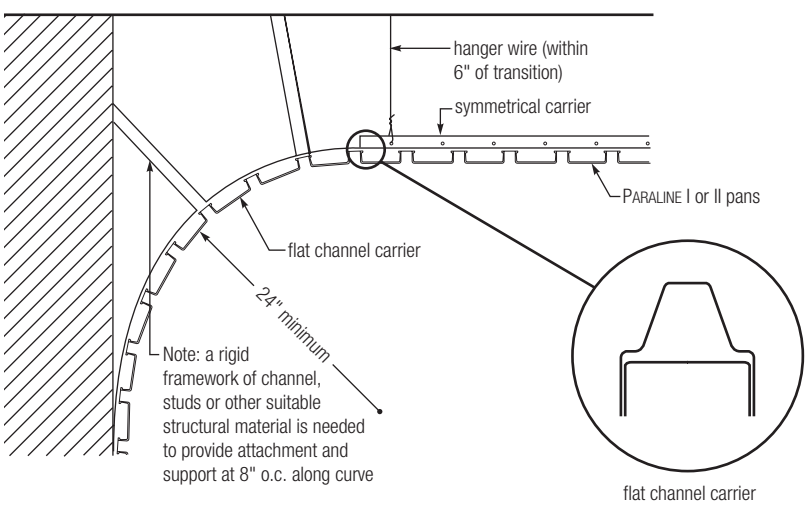


Suspension

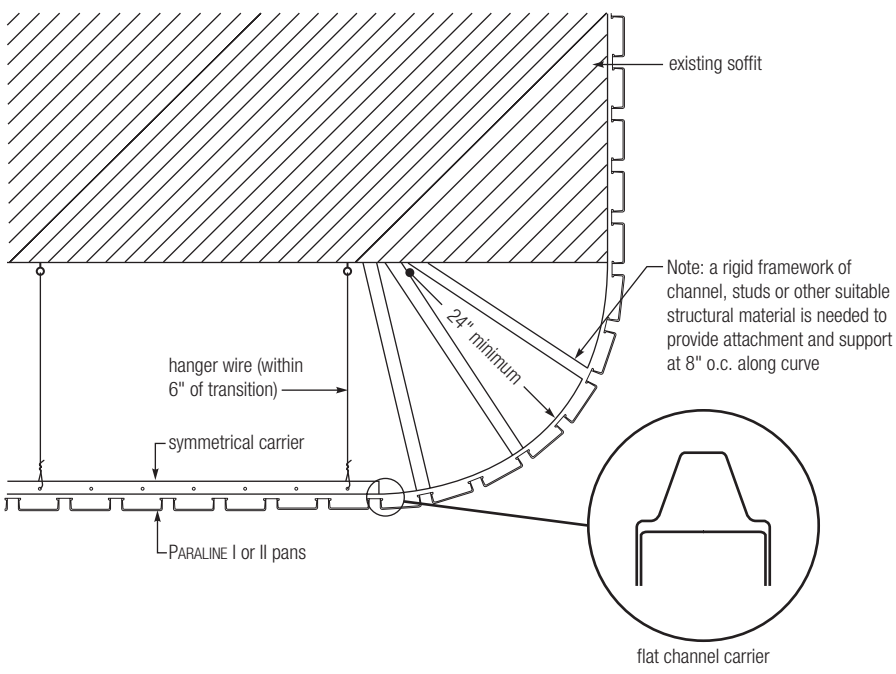


Symmetrical Carrier with Flat Channel Carrier

Inside Radius



Outside Radius

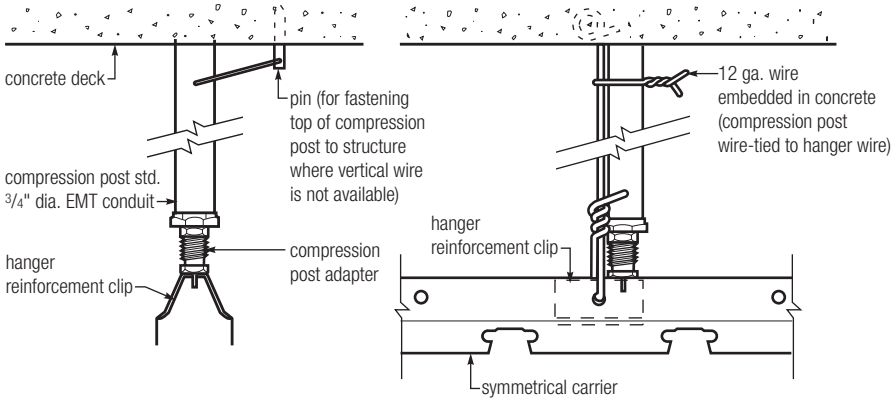


System Applications

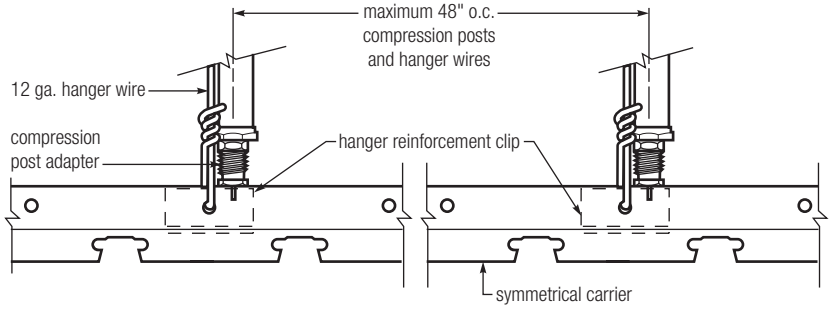
Exterior Construction

Symmetrical Carrier Run

The American Institute of Steel Construction recommends that the slenderness ratio of "length" divided by "radius of gyration" (l/r) of compression members shall not exceed 200. The 3/4″ EMT conduit shown has a radius of gyration of .309″ These compression posts, as well as any other material chosen for compression posts and their installation, should be reviewed by a local structural engineer.

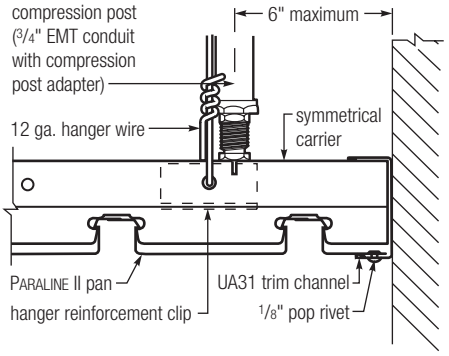


Adjustable Compression Post Detail

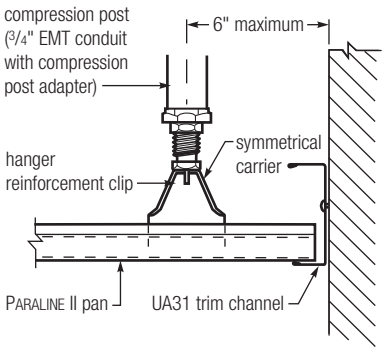


Wall Intersection

Pans Parallel to Wall



Pans Perpendicular to Wall



System Performance

Wind Resistance

PARALINE ceiling systems may be used for sheltered exterior applications such as soffits and drive-throughs. PARALINE I and PARALINE II systems have been tested for wind load strength. The two units of measure commonly used are miles per hour (mph) and pounds per square foot (psf),equated by the formula.

Testing of the two PARALINE systems reach dynamic wind loads of up to 120 mph. Testing was conducted by an independent laboratory using standard and approved testing methods and equipment. Neither system revealed evidence of damage, failure, deformation or permanent set under these extreme wind load stresses. The PARALINE II system was further tested at negative (downward) wind load pressures up to 99 mph. Copies of these test results are available from your USG Interiors representative for design evaluation.
Note: Finish is not UV-resistant; PARALINE should not be installed where direct exposure to sun or weather will occur, such as fascias or facades.

Tested Layout

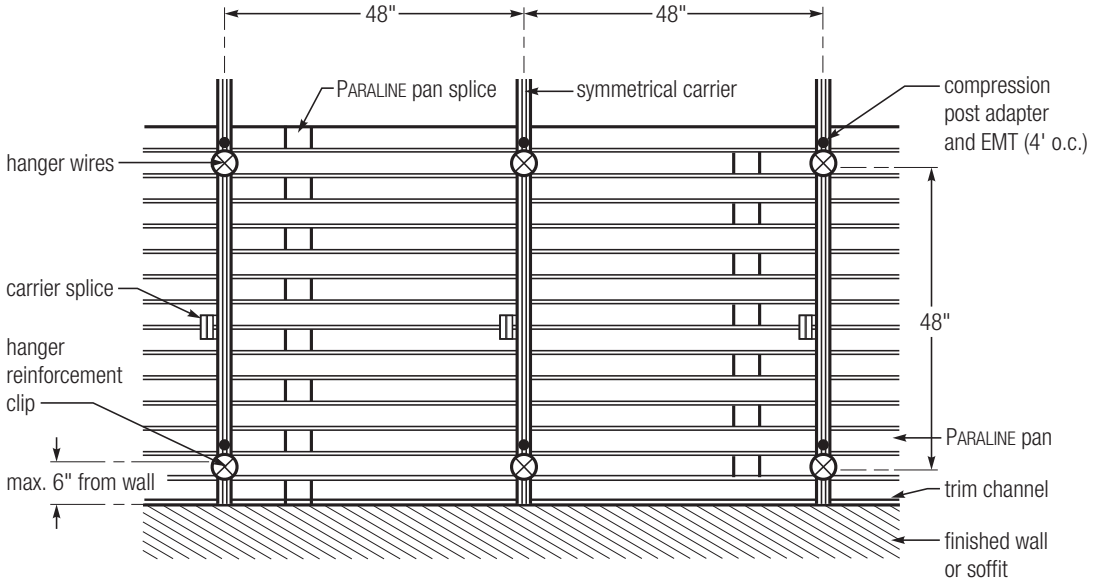
120 mph

Technical Data

– Wind load as certified by Construction Research Labs tests No. 2629A and 2725D.
– Compression posts used for test were 3/4″ EMT conduit with compression post adapters.

Guidelines

– Building structure from which the PARALINE system is suspended and spaced, as well as hanger wire and compression post attachment methods, must be capable of withstanding the loads applied during wind conditions.
– Other materials can be used for compression posts, provided the compressive strength and attachment method are approved for use by a local structural engineer.
– Architect's details must cover design and location of expansion joints in addition to meeting all applicable building code requirements.



Note: The American Institute of Steel Construction recommends that the slenderness ratio of "length" divided by "radius of gyration" (l/r) of compression members shall not exceed 200. The 3/4″ EMT conduit shown has a radius of gyration of .309″ These compression posts and their installation, should be reviewed by a local structural engineer.

System Performance

Acoustics

Noise Reduction

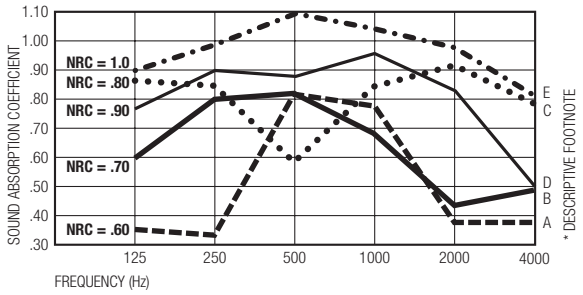
Acoustical performance of PARALINE ceiling systems will vary depending on the system selected (PARALINE I, II or III), pan style (perforated or unperforated; open or closed reveal) and type and amount of acoustical material used as an overlayment.

The following data is helpful for selecting the PARALINE ceiling components and acoustical materials needed to deliver the acoustical performance desired (see next page for graphed data).

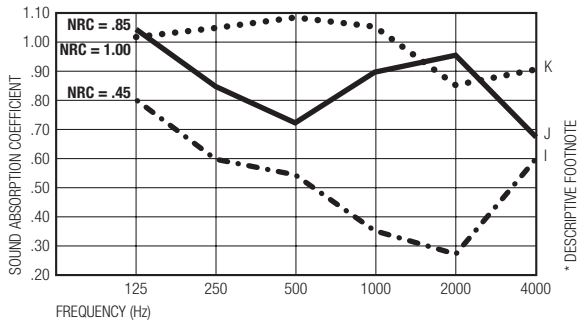
		1/3 Octave Central Bank Frequency (Hz)									
		125	250	500	1000	2000	4000				
	Noise Reduction Coefficient (Range)	**Sound Absorption Coefficient**						**Perforated or Unperforated**	**Acoustical Material**	**Mount***	**Test Report #**
PARALINE I Open Reveal	.55-.65	.35	.34	.82	.78	.39	.39	Unperforated[A]	5/8″ Wet Felted Acoustical Panel	#7	A71-5
	.65-.75	.60	.80	.82	.68	.43	.49	Unperforated[B]	1″ Glass Fiber (In Bag)	#7	7801-089
	.75-.85	.86	.85	.58	.83	.91	.79	Perforated[C]	1″ Glass Fiber Insulation	#7	7901-143
	.85-.95	.78	.90	.88	.97	.83	.49	Perforated[D]	1-1/2″ Glass Fiber (In Bag)	#7	A78-163
	.90-1.00	.90	.97	1.10	1.05	.99	.81	Perforated[E]	3″ Glass Fiber (In Bag)	#7	A78-153
PARALINE II Closed Reveal	.15-.25	.47	.31	.17	.17	.21	.19	Unperforated[F]	No Insulation	#7	A78-177
	.70-.80	.67	.79	.64	.87	.79	.48	Perforated[G]	1″ Glass Fiber Insulation	#7	A78-158
	.90-1.00	.83	.98	1.09	1.00	.85	.63	Perforated[H]	3″ Glass Fiber (In Bag)	#7	A78-155
PARALINE III Open Reveal	.40-.50	.80	.61	.53	.33	.27	.60	Unperforated[I]	1″ Glass Fiber Insulation	E-400	8401-016
	.80-.90	1.05	.83	.71	.90	.95	.67	Perforated[J]	1″ Glass Fiber Insulation	E-400	8401-020
	.90-1.00	1.02	1.05	1.07	1.05	.85	.90	Perforated[K]	3″ Glass Fiber Insulation	E-400	8401-023

[A] Unperforated; open reveal (18.75% open area) installed with 5/8″ mineral fiber board on PARALOCK main tees, 8.3 lbs./cu.ft density; #7 mounting.
[B] Unperforated; open reveal (18.75% open area) installed with 1″ thick glass fiber insulation in polyethelene bag, 2 lbs./cu. ft. density; #7 mounting.
[C] Perforated; open reveal (23.93% open area) installed with 1″ thick glass fiber insulation, 2 lbs./cu. ft. density; #7 mounting.
[D] Perforated; open reveal (23.93% open area) installed with 1-1/2″ thick glass fiber insulation in polyethelene bag, 1.55 lbs./cu. ft. density; #7 mounting.
[E] Perforated; open reveal (23.93% open area) installed with 3″ thick glass fiber insulation in polyethelene bag, 1.55 lbs./cu. ft. density; #7 mounting.
[F] Unperforated; closed revewl (0% open area) with no insulation; #7 mounting.
[G] Perforated; closed reveal (5.18% open area) installed with 1″ thick glass fiber insulation, 1.25 lbs./cu. ft. density; #7 mounting.
[H] Perforated; closed reveal (5.18% open area) installed with 3″ thick glass fiber insulation in polyethelene bag, 1.55 lbs./cu. ft. density; #7 mounting.
[I] Unperforated; open reveal (9.38% open area) installed with 1″ thick glass fiber insulation, 2 lbs./cu. ft. density Type E-400 mounting.
[J] Perforated; open reveal (14.58% open area) installed with 1″ thick glass fiber insulation, 2 lbs./cu. ft. density; Type E-400 mounting.
[K] Perforated; open reveal (14.58% open area) installed with 3″ thick glass fiber insulation, .75 lbs./cu. ft. density; Type E-400 mounting.
* Per ASTM E795. Mounting Method #7 is now referred to as Mounting Method E405 per ASTM E795.

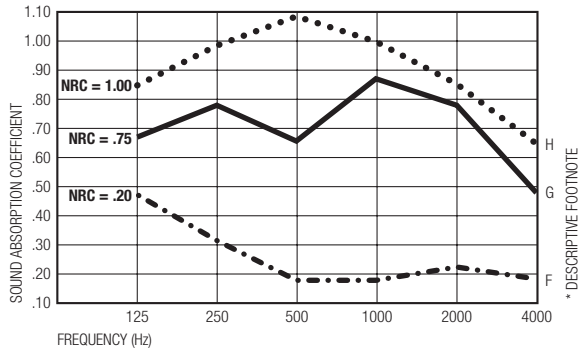
PARALINE I Open Reveal



PARALINE III
Openveal



PARALINE II
Closed Reveal

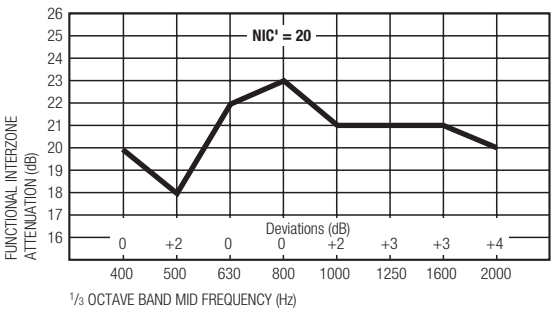


Noise Isolation

PARALINE I

Perforated; open reveal (23.93% open area) installed with 3″ thick glass fiber insulation in polyethylene bag, .75 lbs./cu. ft. density; Test Method PBS C. 2; ceiling height 9′0″; chart depicts survey path perpendicular to PARALINE pans. NIC′ of 19 when survey path is parallel to pans. Test report no. DP – 22279 -188.

	1/3 Octave Band Mid-frequency							
	400	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**
Functional Interzone Attenuation (dB)	20	18	22	23	21	21	21	20



System Performance

Fire Resistance

Design

The fire-rated PARALINE ceiling system reduces construction costs by eliminating the need for a separate fire-rated membrane or intumescent coating. The ceiling system described here has been tested and approved by Underwriters Laboratories. The system is listed as a two- or three-hour floor/ceiling assembly with a three-hour beam rating. PARALINE pans and fire-rated PARALOCK suspension with DXL cross tees maintain the integrity of the fire-protective membrane by allowing thermal expansion.

The integral splice of PARALINE I pans allows the pans to telescope and override each other when exposed to the heat of fire. Standard butt-cut pans and splice plates may also be used. PARALINE air boots, fitted with the prescribed fire-protective acoustical material, are part of the fire-rated assembly. Protected standard lighting fixtures also may be used.

The PARALOCK suspension system is designed for use with PARALINE pans in the fire-rated system. PARALOCK suspension members allow expansion with fire-relief notches built into the main tees to offset movement at the ends of cross tees.

Features

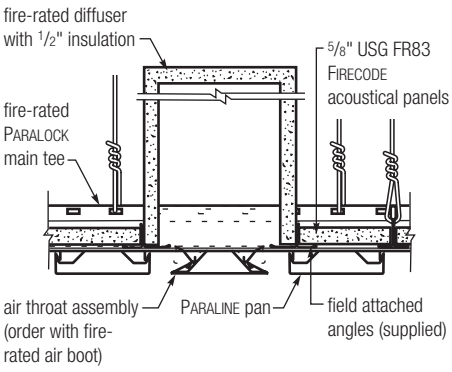
- UL fire-rated design No. D-218 rating for two-hour or three-hour restrained or unrestrained assembly and three-hour unrestrained beam rating.
- UL Fire-Rated Design Nos. P230 and P269 also available.
- PARALINE I pans constructed of steel or aluminum with integral splice or butt cut.
- PARALINE II pans constructed of aluminum.
- Expansion-relief notches in main tees of the fire-rated PARALOCK suspension system.
- Air boot and light fixtures directly supported by the fire-rated PARALOCK suspension system.
- Offsetting expansion allowance at each end of fire-rated cross tees with PARALOCK suspension system.

PARALINE Fire-Rated System Components

Fire Rating and UL Number	Board Thickness	Board Mfr.	Percentage of of Fixtures per 100 Sq. Ft.	Air Opening Inches per Sq. Ft.	Concrete Thickness
2-Hour; D218	5/8″, 3/4″	USG Interiors	4.5% PARALINE/ 20% 2 x 4	72	2-1/2″
3-Hour; D218	5/8″, 3/4″	USG Interiors	4.5% PARALINE/ 20% 2 x 4	72	3-1/4″

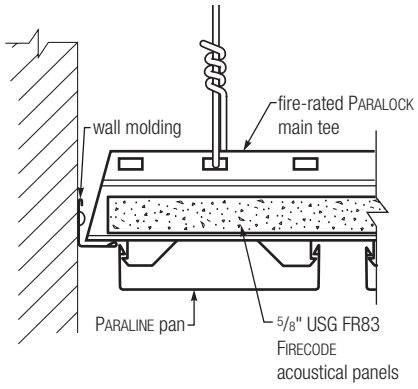
From the Fire Resistance Index of Underwriters Laboratories, Inc. resistance classification (fire) floor or roof, ceiling constructions and beam protection.

Air Diffuser Assembly

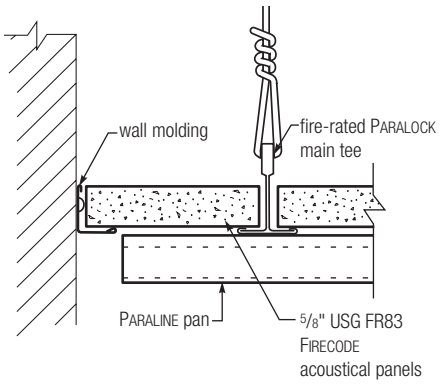


Wall Intersection

Pans Parallel to Wall



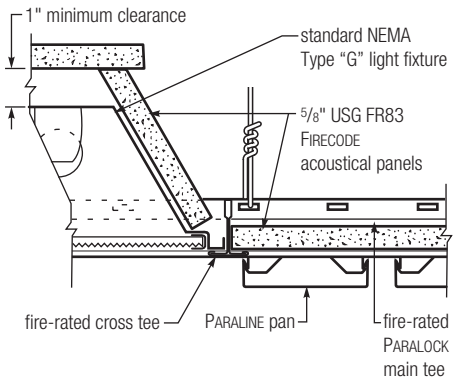
Pans Perpendicular to Wall



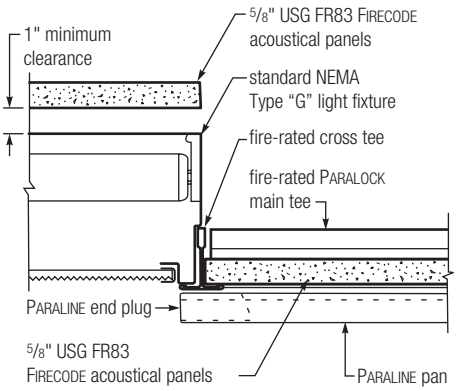
Note: Some hanger wires omitted for detail clarity. Refer to U.L. Design #D-218 for exact requirements.

Standard NEMA Type "G" Light Fixture

End View



Side View



System Performance

Fire Resistance

Air Handling

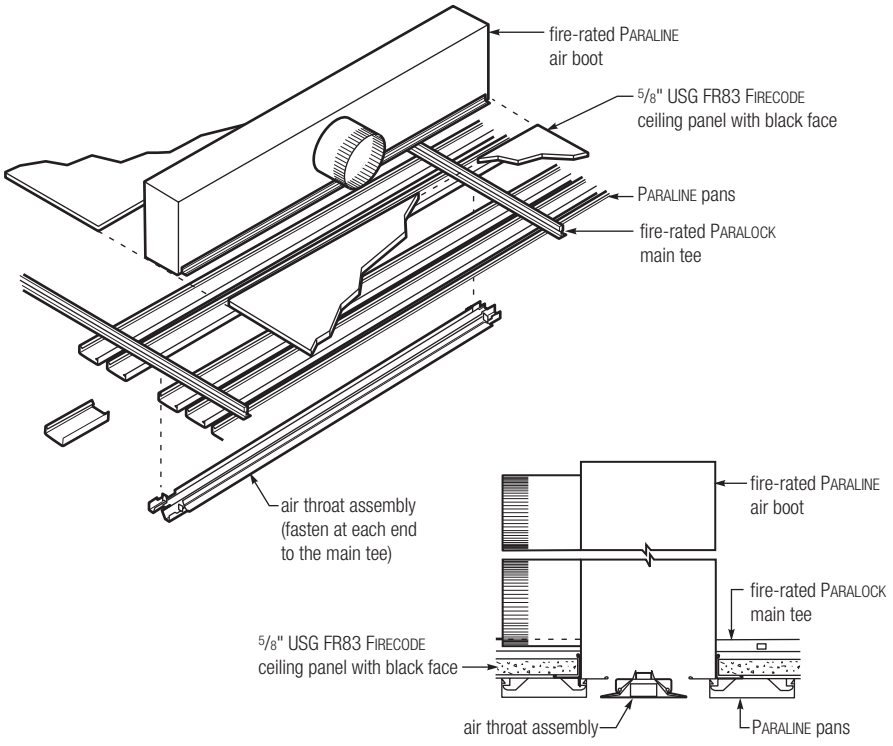
Fire-rated PARALINE ceilings require a specially designed air boot. The boot integrates fully with PARALINE ceiling designs and has been tested and approved by Underwriters Laboratories under UL Design D-218.
Note: If compliance with UL-555 is required, a fusible-linked damper will be needed between the air boot and supply duct.

Features

– Galvanized sheet metal construction to resist corrosion.
– Lined with 1/2″ neoprene-coated glass fiber insulation (1-1/2 lbs./cu. ft. density) permanently bonded to the interior for acoustical performance and fire-rated insulating capacity.
– Directly supported by PARALOCK suspension system for fire-rated construction.
– Direction and volume controlled with face-operable weirs.
– Equipped with 6″ or 8″ diameter side-entry inlet collar.

Performance

Two-slot air boot with 6″ collar delivers 320 CFM at 35 NC and 0.08 WG static pressure (see IC471 page 10).



Application Guide Specifications

Note to specifier: The following specification for PARALINE Linear Metal Ceiling System is a guide in the preparation of a project specification for an exterior and interior fire-rated or non-fire-rated linear metal ceiling system with integrated lighting and air distribution components, and includes suspension members and accessories as required to complete the installation. Delete such items that are not related to the particular project. Where blank spaces occur, provide information incidental to the particular project for which the specification is prepared.

The International System of Units (Metric Units) is available on request.

Section 13_____.

Part 1 General

1.01 Description of Work

A. Related work specified elsewhere:
- **1.** Insulation: Section_____
- **2.** Mechanical equipment: Section_____
- **3.** Electrical: Section_____
- **4.** Gypsum board systems: Section_____
- **5.** Acoustical ceilings: Section_____

B. Work installed but furnished under other sections:_____

C. Work furnished but installed under other sections:
- **1.** Lighting components incidental to integrated ceiling system.
- **2.** Air distribution components incidental to integrated ceiling system.

1.02 System Description

A. Interior and/or exterior linear metal ceiling system (fire-rated) (non-fire-rated assemblies, consisting of prefinished aluminum or steel pans mounted to a carrier system and incorporating lighting fixtures and air handling components as applicable to the particular project design.

1.03 Quality Assurance

A. Subcontractor qualifications: Installer shall have not less than three years of successful experience in the installation of linear metal ceiling systems on projects with requirements similar to requirements specified.

B. Requirements of regulatory agencies: Codes and regulations of authorities having jurisdiction.

C. Source quality control:
- **1.** Test reports: Manufacturer will provide test certification for minimum requirements as tested in accordance with applicable industry standards and/or to meet performance standards specified by various agencies.
- **2.** Changes from system: System performance following any substitution of materials or change in assembly design must be certified by the manufacturer.
- **3.** Wind load resistance tests: Exterior metal ceiling system shall withstand wind blasts of up to 120 miles per hour (mph) with no deformation or excessive permanent set.

1.04 References

A. ASTM C635 and C636: Manufacturing and Installation of Suspended Ceilings.

B. Underwriters Laboratories Inc.: Fire Resistance Directory, Design D218.

C. ASTM E119: Fire Tests of Building Construction and Materials.

D. ASTM C423: Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

1.05 Submittals

A. Samples: Submit representative sample of color and finish of all exposed materials.

B. Shop drawings:
- **1.** Reflected ceiling plans: Indicate layout arrangement of ceiling design, dimensions and locations of related integrated lighting and air distribution components.
- **2.** Installation drawings: Detail complete installation including carrier system, connections between carrier system, connections between carriers and pans, details of level changes and/or changes in pattern, installation of related lighting and air distribution components, access requirements, sound absorption requirements, and fire rating requirements when applicable.

3. Manufacturer's data: Submit manufacturer's catalog cuts or standard drawings showing details of system with project conditions clearly identified and manufacturer's recommended installation instructions.
4. Maintenance materials: Submit one percent of amount of linear metal ceiling components installed.

1.06 Delivery, Storage and Handling

A. Delivery of materials: Deliver materials in original, unopened packages clearly labeled with the manufacturer's name and identification number.
B. Storage: Store in manner that will prevent warping, scratches or damage of any kind.
C. Handling: Handle in such a manner as to insure against racking, distortion or physical damage or any kind.

1.07 Project Conditions:

A. Existing conditions: (Include specific alteration work requirements for project.)
B. Environmental requirements for interior installation: Building shall be enclosed with windows and exterior doors in place and glazed, and roof watertight before installation of linear metal ceiling system and related ceiling components. Climate condition range of 60 °F (15.56 °C) to 85 °F (29.44 °C) and relative humidity of not more than 70 percent.
C. Coordination with other work:
1. Mechanical work: Ductwork above ceiling shall be complete, and permanent heating and cooling systems operating to climate conditions prior to installation of linear metal ceiling components.
2. Electrical work: Installation of conduit above ceiling shall be complete before installation of linear metal ceiling components.
3. Fire protection work: Fire protection lines and/or equipment occurring above ceiling shall be completed and tested before linear metal ceiling components are installed.
D. Protection: Protect completed work above ceiling system from damage during installation of linear metal ceiling components.

Part 2: Products

2.01 Manufacturer

PARALINE Linear Metal Ceiling System as manufactured by USG Interiors, LLC, Chicago, Illinois, U.S.A.

2.02 Materials

A. Pans: **(Delete items not applicable.)**
1. PARALINE I: 3-1/4″ wide face, 3/4″ vertical legs with edges formed for attaching to carrier support system on 4″ centers.
a. Aluminum: Roll-formed aluminum sheet (.024″ nominal) (perforated) (unperforated); factory-finished in (baked enamel paint finish) (color_____) (polished or brushed with clear protective finish).
b. Splice plate: Aluminum in (matte black finish) (finish to match pans); formed for snap-fit in butt-cut pan ends.
2. PARALINE II: 3-1/4″ wide face, 3/4″ vertical legs with carrier attachment edge and integral closure flange.
a. Aluminum: Roll-formed aluminum sheet (.024″ nominal) (perforated) (unperforated); factory-finished in (baked enamel paint finish) (color____) (polished or brushed with clear protective finish).
b. Closure flange finish: (Matte black) (finish to match pans).
c. Splice plate: (Matte black finish) (finish to match pans); formed for snap-fit in butt-cut pan ends.
3. PARALINE III: 7-1/4″ wide face, 3/4″ vertical legs with edge formed for attaching into carrier support system.
a. Aluminum: .027″ nominal roll-formed aluminum sheet, smooth surface; factory-finished in (baked enamel paint finish) (color____).
b. Splice plate: (Matte black finish) (finish to match pans); formed for snap-fit in butt-cut pan ends.
B. Support system: (Delete items not applicable.)
1. Interior carrier system: PARALOCK main tee, 25-gauge commercial quality HDG steel; face capped during forming; factory-finished in matte black baked enamel paint finish.
a. Main tees: Double-web design, 1-1/2″ high, 15/16″ wide face; hook-shaped tabs punched into face for locating and attaching pans 4″ o.c. and 3/4″ apart, with integral reversible splice.
b. Cross tees: Double-web design, 1-1/2″ high, 15/16″ wide face.

2. Interior or horizontal exterior carrier system: .040″ nominal aluminum alloy, roll-formed; factory-finished in matte black baked enamel paint finish.
Symmetrical carrier: Inverted V-shaped carrier, 1-5/8″ high by 1-3/4″ wide; each leg notched for locating and attaching pans 4″ o.c. and 3/4″ apart.
Expansion carrier: Same as Symmetrical Carrier except 4-1/8″ for spacing pans 7/8″ apart.
Contraction carrier: Same as Symmetrical Carrier except 3.906″ module for spacing pans .656″ apart.
Splice sections: Formed to match configuration of carrier; 6″ long.
Hanger reinforcement clip: Formed to match configuration of carrier. Used in exterior applications to reinforce symmetrical carrier at hanger wire attachment points.

3. Flat channel carrier: Aluminum channel shape, 7/8″ high by 1-3/4″ wide; each leg notched for locating and attaching pans 4″ o.c. and 3/4″ apart.

4. Renovation carrier: 25-gauge commercial quality cold-rolled steel; factory-finished in matte black baked enamel paint finish; formed with tabs for locating and attaching pans 4″ o.c. and 3/4″ apart; integral top tab for direct attachment to existing suspended tees.

C. Lighting components:

1. Standard NEMA Type G: 12″ x 48″ up to 24″ x 48″ (not manufactured by USG Interiors).

D. Air-distribution components:

1. Air boot: 28-gauge galvanized sheet steel; interior lined with black fiberglass insulation, 1/2″ thick, 1.5 lb./cu. ft. density; size as indicated.

2. Collar: sheet steel, galvanized, _____diameter.

3. Diverters: Labyrinth of black vinyl, locate on vertical legs of PARALINE pans to achieve desired air pattern.

E. **a.** Acoustical material: Black Class "A" acoustical material, no surface printing; (1″ thick fiberglass, 2 lbs./cu. ft. density, .70 NRC) (1-1/2″ thick fiberglass, 1-1/2 lbs./cu. ft. density, .60 NRC) (3″ thick fiberglass, 1.55 lbs./cu. ft density, 1.00 NRC).
b. 5/8″ Wet Felted Acoustical Panels by USG.

F. Fire-rated ceiling system:

1. Rating standard: Insulation and components to comply with UL Design_____; (1) (2) (3) hour rating, and components shall bear appropriate UL label.

2. Pans: PARALINE pans as specified.

3. Support system: DXL PARALOCK main tees and DXL cross tees as specified with expansion relief notches on main tees, and cross tees offset at face ends to rest on back of main tee face, complying with UL Design _____.

4. Lighting components:
a. Standard NEMA Type G lay-in nominal 24″ X 48″, classified for fire resistance and complying with specified UL Design.
b. Protection board: 5/8″ thick USG FR83 FIRECODE protection at top and two sides of fixture, and at ends when fixture is located below or adjacent to a beam; and complying with UL Design D218.

5. Air distribution components: Air boot and collar assembly, as specified, equipped with volume control damper, size as required to meet design requirements.
a. Air boot: PARALINE fire-rated air boot (6″ collar) (8″ collar) with damper.
b. PARALINE air throat assembly: Color and finish to match ceiling pans; screw fastened to main tees.

6. Acoustical material: (5/8″) (3/4″) thick, USG FR83 FIRECODE board having a noise reduction coefficient (NRC) range of .50 to .60 when tested in accordance with ASTM C423.

G. Accessories

1. Trim channel: .024″ nominal aluminum, roll-formed into channel shape (finish to match pans) (black).

2. End plugs: Size and configuration of pan design; material (finish to match pans) (black).

3. Tee converter clip: Used to adapt standard main tee for PARALINE attachment or to space pans at different modules.

4. Rotating pan clip: Used where pans run at other than 90° to main tees.

5. Vinyl space clip: Used to set module and prevent linear movement of PARALINE (I) (III) pans; extruded of matte black vinyl material.

6. Pan retainer clip: Spring steel clip used to prevent pans from being dislodged from PARALOCK main tee due to impact.
7. Seismic clip: Used to secure PARALINE I or III pans for seismic installations.
8. Compression posts (exterior installations): size as required to withstand wind load and include integral leveling adjustment.
9. Compression post adapter (exterior installations): adapts standard 3/4″ EMT conduit for use as compression member for exterior application of PARALINE ceiling.
10. Face tee cover: Used to cover tabs on PARALOCK main tees between NEMA Type G fixtures when installed end-to-end; finished in standard matte black finish.
11. Access door kit: Used with standard pans and PARALOCK carriers to field-fabricate up to a 36″ x 36″ (upward) (downward) access door; or with standard pans and symmetrical carriers to field-fabricate downward access doors.
12. Mechanical fasteners: Material and finish to match item to which installed; type and size as required for particular installation.

2.03 Fabrication

- **A.** Pans: Edges formed to snap onto carrier members and provide positive locking mechanism with no additional fasteners; factory-finished to match approved samples.
- **B.** Support system: Formed and fabricated for mechanical connection with adjoining section and pre-punched holes for (direct suspension) (mechanically fastened in place).
- **C.** Air distribution components: Formed to provide airtight assembly and positive connection to mechanical equipment components.

Part 3: Execution

3.01 Inspection

- **A.** Examine areas to receive linear metal ceiling system for conditions which will adversely affect installation.
- **B.** Do not start work until unsatisfactory conditions are corrected.
- **C.** Work to be concealed: Verify work above support system is complete, tested and installed in manner that will not affect layout and installation of linear metal ceiling system.
- **D.** Fire rated assembly: Construction above ceiling system shall meet requirements as applicable to provide fire-resistance rating specified for integrated linear metal ceiling system, UL Design _____.
- **E.** Exterior wind bracing to be approved by a registered professional engineer licensed by the state where the product is being installed.
  Note: Exterior refers to horizontal applications such as soffits and drive-throughs – not intended for fascias or facade use.

3.02 Preparation

- **A.** Field dimensions: Installer must verity actual field dimensions prior to installation.
- **B.** Renovation work: In locations where open-reveal pans are to be installed over existing surfaces, existing surfaces shall be painted matte black before renovation carriers are installed. (With closed-reveal pans, painting is not required.)
- **C.** Coordination: Coordinate and schedule installation of linear metal ceiling system with work of other trades affected by this installation, with particular attention to mechanical and electrical work that must be installed and operating before ceiling work can begin.

3.03 Installation

- **A.** Reference: Install in accordance with approved shop drawings and manufacturer's instruction. Follow architects' details for thermal and building expansion joint treatments.
- **B.** Hanger wires:
  1. Spacing: Space hanger wires maximum 48″ o.c. along length of carrier system, attached directly to structure above.
  2. Limitation: Do not support hanger wires from mechanical and/or electrical equipment, piping, or other equipment occurring above ceiling.
  3. Provide additional fixture support as required in accordance with local building codes or other regulatory agencies.
- **C.** Carrier system: Space (PARALOCK main tee 48″ o.c.) (symmetrical carrier [48″] [50″] o.c.) and secure with

hanger wires, or secure directly to structural supports.

1. Adjustment: Align support system straight, level and in required position.
2. Mechanical fasteners: Where required, install in manner that will provide completed assembly to conform to project design requirements.

D. Pans:

1. PARALINE ll pans must be installed in alternate rows to ensure point access.
2. Changes in direction: Where ceiling pans change direction, trim pans to correct angles and secure ends for rigidity.
3. End plugs: When pan ends are visible, install end plugs flush with end surface.
4. Acoustical material: Where acoustical material is required, install material across top of ceiling pans between support system members.
5. Access: Where access to area above ceiling is required, (remove pans) (cut ceiling pans and carriers to required dimensions and install access door assembly as recommended by manufacturer and in accordance with approved shop drawings).

E. Lighting components: Refer to Section 16_____.

F. Air distribution components: Refer to Section 15_____.

G. Fire-rated ceiling system:

1. Reference: Install fire-rated linear ceiling components in accordance with Underwriters' Laboratories Design _____, meeting (1) (2) (3) -hour rating.
2. Hanger wires: Install hanger wires in accordance with the following requirements, as applicable:
   - **a.** Maximum 48″ spacing along fire-rated PARALOCK main tees system.
   - **b.** At four corners of grid modules containing light fixtures and/or air-distribution components.
   - **c.** At center of each cross tee forming long sides of grid modules containing light fixtures or air-distribution components.
   - **d.** Within 6″ of main tee splice.
3. Pans: splice butt-end pans with splice plate.
4. Air distribution components: Refer to Section 15_____.
   - **a.** Collar end standard: Install as recommended for attachment to mechanical components.
   - **b.** Diverters: Install integral splice sections to pans at both ends and secure to carrier members at each end with self-drilling, self-tapping screws.
   - **c.** Air boot spacing: Maximum one per 100 sq. ft. of ceiling area.

H. Exterior Installation: Install hanger reinforcements, compression posts and other structural components as required per structural engineer's evaluation.

3.04 Cleaning

A. PARALINE pans: Clean painted pans with nonabrasive, non-solvent-based commercial cleaner. Clean polished finishes with nonabrasive, quick-drying glass cleaner. A soft cotton cloth is recommended.

B. Immediately remove any corrosive substances or chemicals that would harm painted finish.

C. Touch-up all minor scratches and spots, as acceptable, or replace damaged sections when touch-up is not permitted.

D. Removal of debris: Remove all debris resulting from work of this section.

For more information on the

PARALINE Linear Metal Ceiling System

call us or visit our website

at www.usg.com.

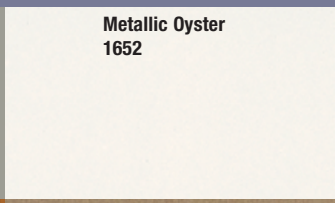
The color reproductions shown below are representations only. Please request a color sample by emailing our sample literature department at samplit@usg.com or by calling 888 874.2450.

Paraline Perforation Pattern

Polished Chrome
PM61

Brushed Aluminum
089

Silver Satin
002



Metallic Oyster
1652

Metallic Copper
1690

Metallic Gold
1691

Available Finishes

Technical Service
800 USG.4YOU

Web Site
usg.com

Samples/Literature E-mail
samplit@usg.com

Samples/Literature/Fax
888 874.2348

Customer Service
800 950.3839

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Manufactured by
USG Interiors, LLC
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Chicago, IL 60661

IC463/rev. 1-12