

GRID SYSTEM

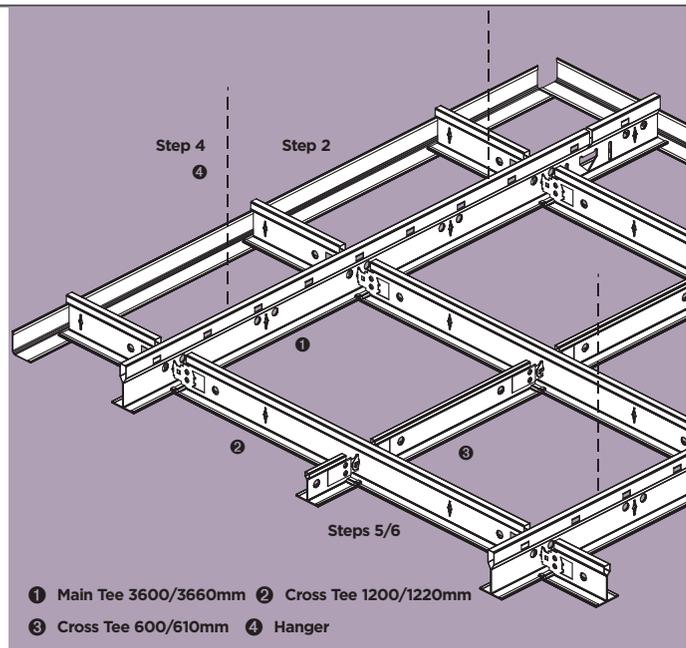
FIRST EDITION

USG BORAL



INSTALLING A DONN® GRID SYSTEM

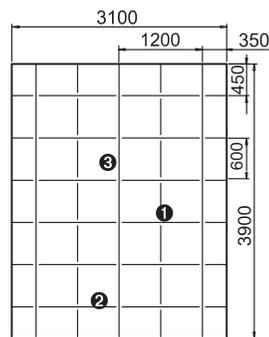
The appearance of a suspended acoustical ceiling is dependent both on the materials used and on the quality of the installation. USG manufactures components to meet BS8290 & BS EN 13964, assuring that the material, structural and quality standards are as prescribed. Installation must meet BS8290, assuring proper level and secure attachment as prescribed. Good construction conditions are very important when successfully installing a suspended ceiling. It is recommended that the temperature and humidity range be 14 - 25°C and max. 75% relative humidity. Store materials in a protected area, store tiles on the job at least 3 days prior to installation.



Step 1

Measuring and planning are key first steps in the installation process.

Measurement and placement of the tees will be on centre (o.c.), meaning from the centre of one to the centre of the next. Planning starts with a drawing of the room that shows all walls, including bays, alcoves beams and stairwells. Note which direction the joists (if any) are running, or if architectural drawings necessitate working in one direction or another. Determine the lines for main runners and cross tees in such a way that the tiles that about the wall are at least half a tile (300mm).

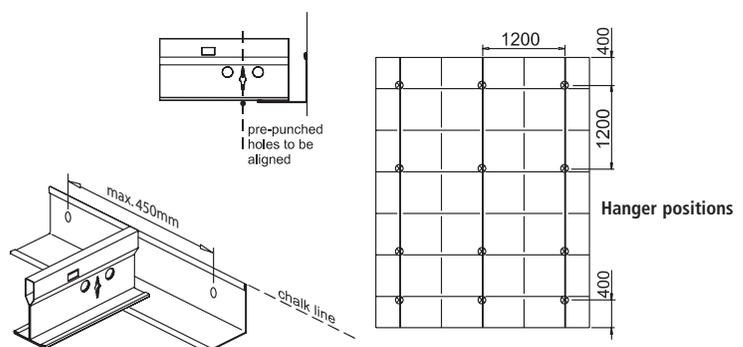


- 1 Main tee 3600/3660mm
- 2 Cross Tee 1200/1220mm
- 3 Cross Tee 600/610mm

Step 2

Mark the desired ceiling height (maintaining at least 70mm clearance below the lowest duct, pipe or beam.)

Measure and mark the walls at all corners above the installation level (= add the height of the wall angle to the desired ceiling height.) Snap a chalk line and test for level. Measuring down from joists or up from the floor is not recommended, since neither may be level. Install wall angle with top edge of angle at the chalk line, spacing appropriate fixings 450mm o.c. or closer. Cut and mitre outside and inside angles at 45°, fitting them snugly together. Alternatively, simply butt angles at corner (as in system illustration).



Step 3

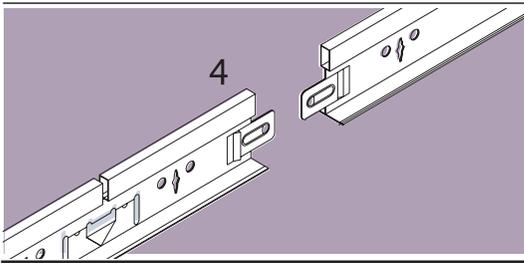
To confirm level, stretch a string until taut along the positions which the main tee will occupy.

Inserting a nail between the wall and the wall angle at marked locations serves as a good anchor for this purpose. Stretch another string across the room where the first row of cross tees will be located. This identifies where the first prepunched slots need to fall. Check to be sure the cross tee string is at 90° to the main tee string via the 3-4-5 method. Install the hangers at 1200mm o.c. above the lines of the main runners. Fix to the structure above using appropriate plugs, screws or other devices.

Step 4

Attach the main runners to the hangers.

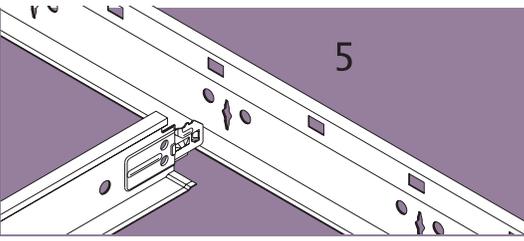
In each row, trim the main tee so that the cross-tee slot will line up with the cross-tee string. Mount main tees, resting the cut end of the main tee on the wall angle. The cut end of the main runner should be about 5mm away from the wall.



Step 5

Install cross tees, assuring that they are adequately connected to main tees (they “click” in place when properly seated).

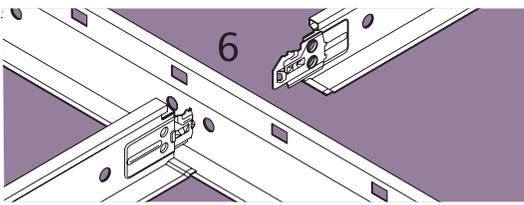
Where two cross tees intersect in the same slot, insert second cross-tee end to the left of the first. Where a cross-tee is installed without an opposing cross-tee, a nail should be slipped into the opening of the cross-tee clip to maintain the pull-out value for the cross-tee.



Step 6

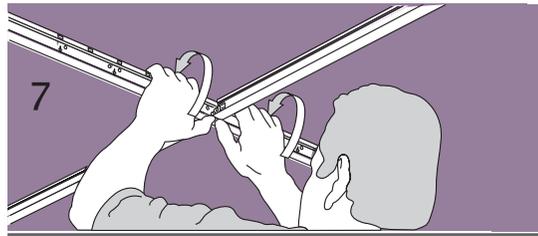
Lay in panels, beginning at one corner and completing row by row.

Tilt each panel up through the opening and lower it to rest squarely on all four tees.



Step 7

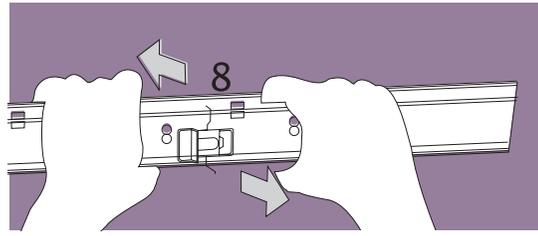
Removal as easy as installation. Just grasp the main tee with one thumb under the main tee-cross tee connection and, pushing up with the thumb, give the main tee a quick, short twist. That's all it takes - no tools needed. The strong clip means that the grid can be reinstated straightaway with no tearing or bending of the clip.



Step 8

Main tee demounting

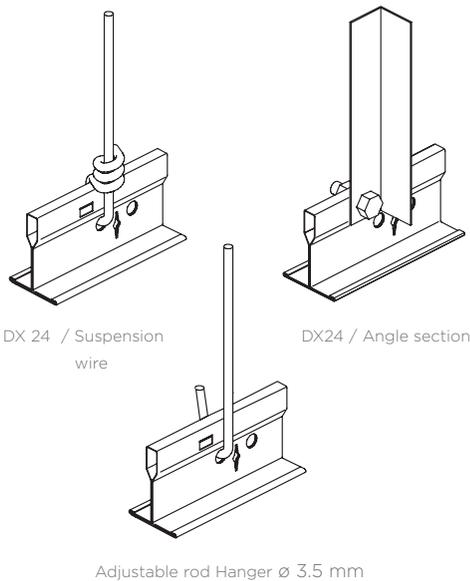
Using a straight shearing motion, push with your left hand and pull with your right hand to disconnect the main runner splice. Note: do not twist the splice during the removal procedure



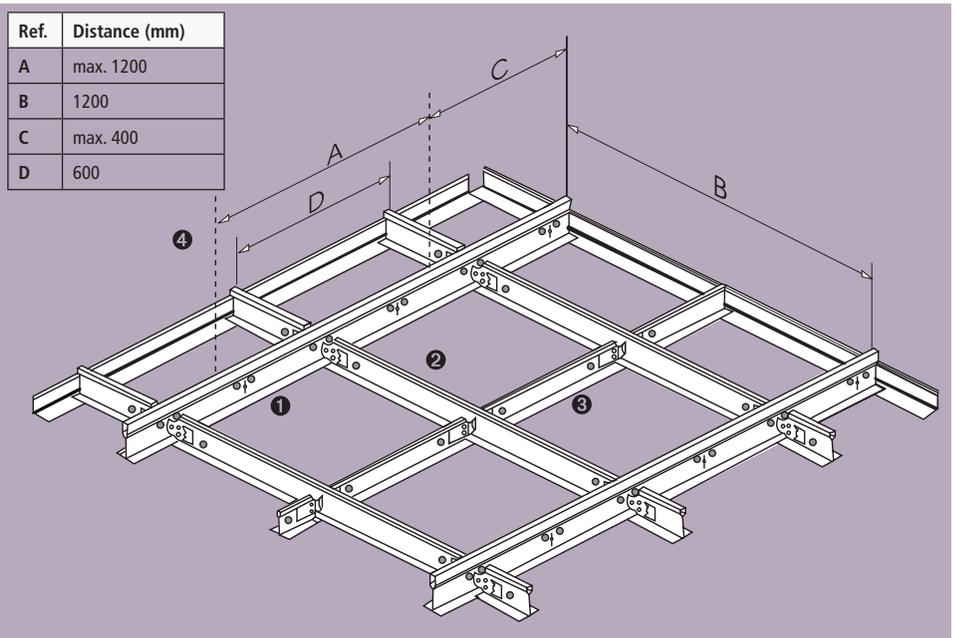
Other installation tips

- A** Cut tees with aviation snips, first the stem and then the flanges.
- B** Cut mineral fibre panels with utility knife and straight edge, cutting the face first. Cut panels should be at least 15mm larger than the opening.
- C** To install panels around obstructions, draw their exact locations on the panels and cut out. Then cut the panel in two parts through the largest section of the cut-out to enable fitting.
- D** To trim for Shadowline edge, use a utility knife to cut the panel, first at the face, then from the edge, to the same depth as Shadowline. If windows, stairwells, etc., extend above the ceiling plane, build suitable valances and attach wall angle.

DONN® EXPOSED GRID



Ref.	Distance (mm)
A	max. 1200
B	1200
C	max. 400
D	600



Materials

All USG suspension systems feature a body and cap made of hot-dip galvanized steel. To ensure that the cap remains attractive and rust-free for long term, manufacturing includes an exclusive four-step coating process that outperforms the competition in paint adhesion and corrosion resistance, as proven by industry-standard salt spray tests conducted by an independent laboratory.

For our extreme environments we offer our grid system, with hot-dipped galvanized steel body and painted aluminum cap for additional corrosion and humidity resistance.

Product Information

Nr	Description	Item reference	
		Metric	Imperial
1	Main Runner	DX3600LD	DX3660LD
2	Long Cross Tee	DX1200LM	DX1220LM
3	Short Cross Tee	DX600LM	DX610LM
4	Wall Angle	MT3600-MS3600	
5	Hanger	35RHXXXX	

Quantity

Linear meter required per square meter

For construction layouts use the following formulas to calculate linear meters (LM) per square meter (m²)

■ Main tee

(1/ Main Tee centres)

eg. if MT at 1200mm centres $\frac{1}{1.2} = 0.83\text{LM}/\text{m}^2$

■ Cross tee

(1/ Cross Tee centres)

eg. if CT at 600mm centres $\frac{1}{0.60} = 1.67\text{LM}/\text{m}^2$

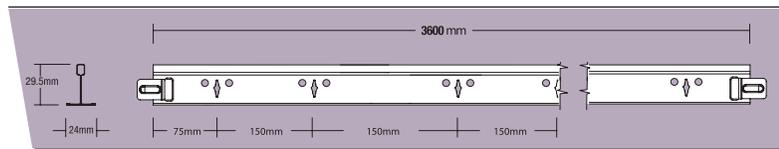
Note: These calculations do not allow for wastage, damage or irregularities but are intended as an informative guideline to assist with the calculation of product required for a given area (in m²)

System characteristics:

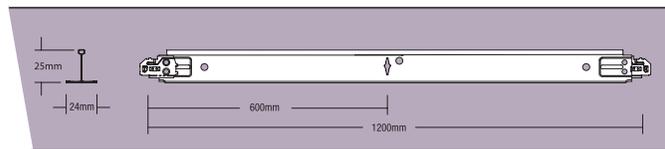
- Exposed 24mm system
- The most widely used grid system in the world
- Safe, fast and simple to install & easily accessible
- Maximum economy and design simplicity
- Cross-tees with override-ends resist twisting and give professionally finished look with no exposed steel edges
- Patented QUICK-RELEASE™ clip design: demountable without tools
- Compatible with square edge and SLB edge ceiling tiles
- Audible Click means you know when tees are connected
- Exceed load compliance specifications as per ASTM C 635
- Available in metric and imperial sizes

DONN® DX24 LIGHT DUTY

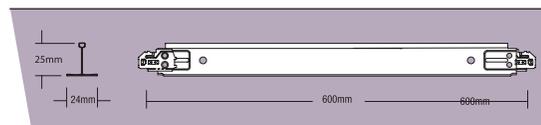
Main Runner DX3600LD



Long Cross Tee DX1200LM



Short Cross Tee DX600LM



Maximum allowed weight of tiles per m² of ceiling

Hanger distance (mm)	Module			
	Main runner at 1200mm		Main runner at 600mm	
800	20.90	21.20	-	-
1000	20.90	21.20	41.90	42.90
1200	10.50	10.50	20.90	20.90
1500	4.10	4.20	8.70	8.90

Note: The load per m² must be distributed uniformly (no point loads) over the ceiling area. After loading, the deflection of any grid component will remain within the maximum deflection per span as stated in BS: 8290: 1991, provided the grid layout is as presented in the sketch.

Please consult USG for other layouts, load or hanger distance.

Specification DONN® DX24-LD

Grid shall be DONN® DX24 exposed grid system, hot dipped galvanised steel 'T' section with pre-painted capping. Table width 24mm. To suit variable module sizes, most typically 600 x 600mm and 1200 x 600mm. Main runners: 29.5 x 24mm, ref DX3600LD shall be normally spaced at 1200mm centres and suspended from the structure or soffit using pre-straightened 2mm diameter HDG steel wire hangers, or adjustable rod hanger ø 35 mm, ref 35 RHXXXX at typically 1200mm centres. First hanger shall be no more than 450mm from the perimeter. Main runners joined end on by means of the integral splice. Splice connections shall be supported within 150mm with a hanger, and shall be staggered across the ceiling area.

Cross tees: 1200mm cross tees, 25 x 24mm ref DX1200LM, shall be installed perpendicular between the main runners at 600mm centres to form a 1200 x 600mm module. If applicable, 600mm cross tees, 25 x 24mm ref DX600LM, shall be installed perpendicular between the 1200mm cross tees to form a 600 x 600mm module. All cross tees feature a 'joggled' end detail.

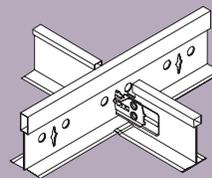
Perimeter trims: 22mm x 19.5mm / 19 x 9 x 9 x 19mm painted HDG steel angle trim, ref MT3600/MS3600, fixed to perimeter wall using fixings appropriate to the structure at maximum 450mm centres. Corners shall normally be finished with a lapped or butt joint.

Tile edge supported



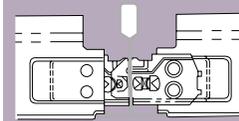
Cross section

Main tee and cross tee connection.



Clip to Clip Security

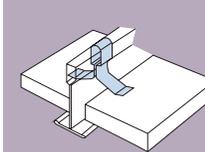
Clip to Clip Connection



180 kg

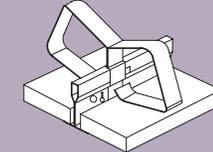
Hold Down Clip

Partition head fixing using revoc clips with DX24.



Spring clip

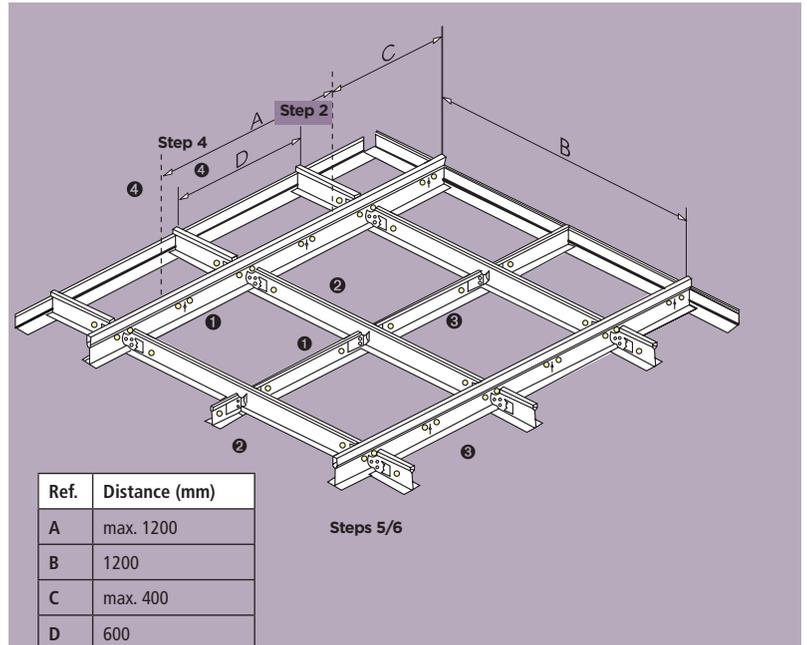
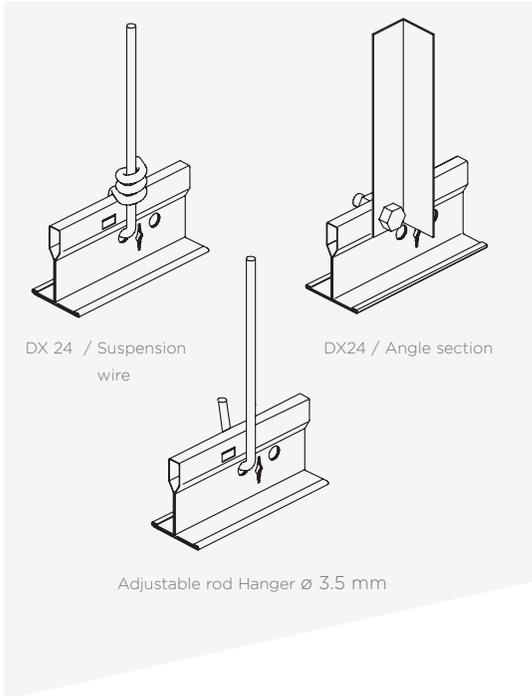
Spring clip application.



Hangers - Seismic Application: Shall be from pre straightened 2mm diameter HDG steel wire, ref DSW2. Hangers shall be fixed through holes in stalk or bulb of main runner and wrapped around itself a minimum of 3 times. Alternatively, hangers can be formed from 25 x 25mm HDG steel angle section, or ø 35mm adjustable rod hanger, fixed to main runners using appropriate self drilling screws or nut and bolt fixings. Hangers shall be normally spaced at 1200mm centres although alternative spacings are acceptable provided maximum loadings stated above are not exceeded. Hangers to be fixed to structure or soffit using fixings appropriate to the structure or soffit.

Hold down clips: Where applicable, these shall be non removable type clips. These generally will only be required in certain fire protecting assemblies or where there is a risk of tile uplift. Where fitted, these should be applied to all grid members at a rate of 1 clip per 600mm of tile edge.

DONN® DX24 INTERMEDIATE DUTY



Materials

All USG suspension systems feature a body and cap made of hot-dip galvanized steel. To ensure that the cap remains attractive and rust-free for long term, manufacturing includes an exclusive four-step coating process that outperforms the competition in paint adhesion and corrosion resistance, as proven by industry-standard salt spray tests conducted by an independent laboratory. For our extreme environments we offer our grid system, with hot-dipped galvanized steel body and painted aluminum cap for additional corrosion and humidity resistance.

Product Information

Nr	Description	Item reference	
		Metric	Imperial
1	Main Runner	DX3600IM	DX3660IM
2	Long Cross Tee	DX1200LM	DX1220LM
3	Short Cross Tee	DX600LM	DX610LM
4	Wall Angle	MT3600-MS3600	
5	Hanger	35RHXXX	

Quantity

Linear meter required per square meter

For construction layouts use the following formulas to calculate linear meters (LM) per square meter (m²)

■ Main tee

(1/ Main Tee centres)

eg. if MT at 1200mm centres $\frac{1}{1.2} = 0.83\text{LM}/\text{m}^2$

■ Cross tee

(1/ Cross Tee centres)

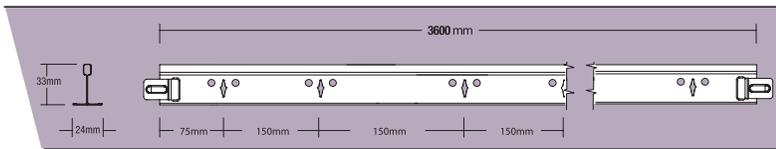
eg. if CT at 600mm centres $\frac{1}{0.60} = 1.67\text{LM}/\text{m}^2$

Note: These calculations do not allow for wastage, damage or irregularities but are intended as an informative guideline to assist with the calculation of product required for a given area (in m²)

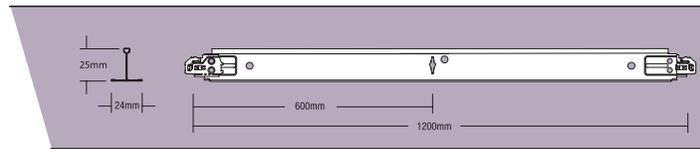
System characteristics:

- Exposed 24mm system
- The most widely used grid system in the world
- Safe, fast and simple to install & easily accessible
- Maximum economy and design simplicity
- Cross-tees with override-ends resist twisting and give professionally finished look with no exposed steel edges
- Patented QUICK-RELEASE™ clip design: demountable without tools
- Compatible with square edge and SLB edge ceiling tiles
- Audible Click means you know when tees are connected
- Exceed load compliance specifications as per ASTM C 635
- Available in metric and imperial sizes

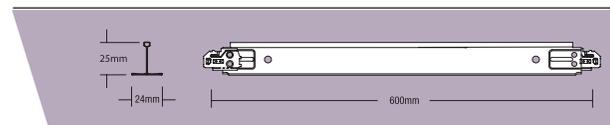
Main Runner DX3600IM



Long Cross Tee DX1200LM



Short Cross Tee DX600LM



Maximum allowed weight of tiles per m² of ceiling

Hanger distance (mm)	Module			
	Main runner at 1200mm		Main runner at 600mm	
800	600 x 600	600 x 1200	600 x 600	600 x 1200
1000	23.2	23.5	46.5	47.6
1200	11.6	11.6	23.2	23.4
1500	4.5	4.6	9.7	9.9

Note: The load per m² must be distributed uniformly (no point loads) over the ceiling area. After loading, the deflection of any grid component will remain within the maximum deflection per span as stated in BS: 8290: 1991, provided the grid layout is as presented in the sketch.

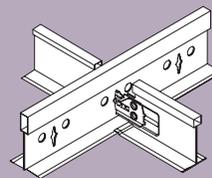
Please consult USG for other layouts, load or hanger distance.

Tile edge supported



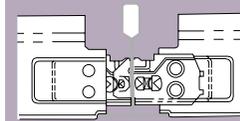
Cross section

Main tee and cross tee connection.



Clip to Clip Security

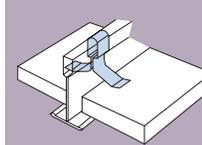
Clip to Clip Connection



180 kg

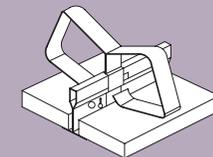
Hold Down Clip

Partition head fixing using revoc clips with DX24.



Spring clip

Spring clip application.



Specification DONN® DX24-IM

Grid shall be DONN® DX24 exposed grid system, hot dipped galvanised steel 'T' section with pre-painted capping. Table width 24mm. To suit variable module sizes, most typically 600 x 600mm and 1200 x 600mm. Main runners: 33 x 24mm, ref DX3600IM shall be normally spaced at 1200mm centres and suspended from the structure or soffit using pre-straightened 2mm diameter HDG steel wire hangers, ref on adjustable rod hanger ϕ 3.5, ref 35 RHXXX at typically 1200mm centres. First hanger shall be no more than 450mm from the perimeter. Main runners joined end on by means of the integral splice. Splice connections shall be supported within 150mm with a hanger, and shall be staggered across the ceiling area.

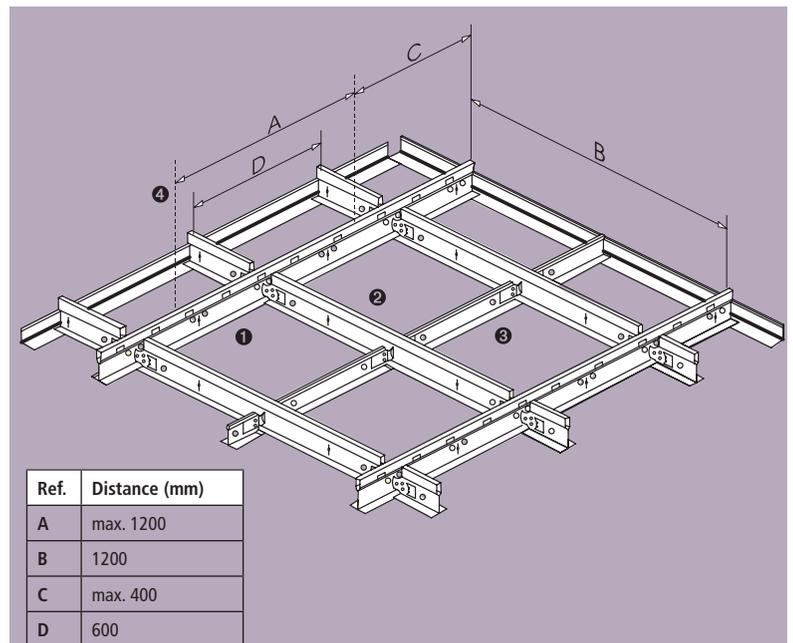
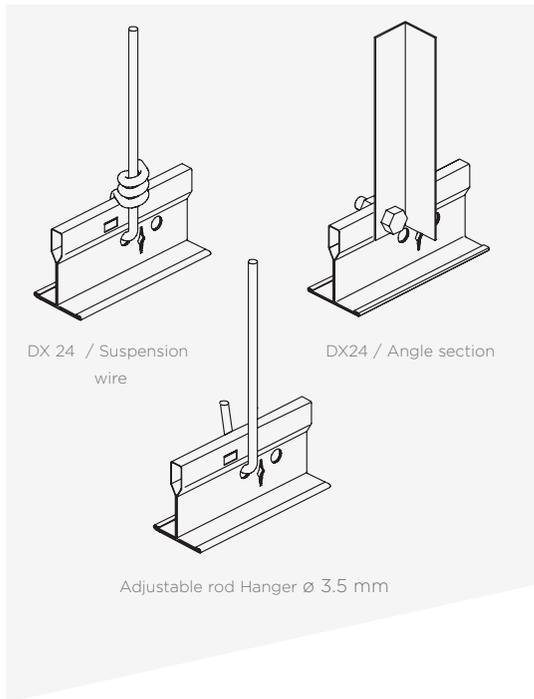
Cross tees: 1200mm cross tees, 25 x 24mm ref DX1200LM, shall be installed perpendicular between the main runners at 600mm centres to form a 1200 x 600mm module. If applicable, 600mm cross tees, 25 x 24mm ref DX600LM, shall be installed perpendicular between the 1200mm cross tees to form a 600 x 600mm module. All cross tees feature a 'joggled' end detail.

Perimeter trims: 22mm x 19.5mm / 19 x 9 x 9 x 19mm painted HDG steel angle trim, ref MT3600/MS3600, fixed to perimeter wall using fixings appropriate to the structure at maximum 450mm centres. Corners shall normally be finished with a lapped or butt joint.

Hangers - Seismic Application: Shall be from pre straightened 2mm diameter galvanized wire hanger, ref 35RHXXXX. Hangers shall be fixed through holes in stalk or bulb of main runner and wrapped around itself a minimum of 3 times. Alternatively, hangers can be formed from 25 x 25mm HDG steel angle section, on 35 ϕ mm adjustable rod hanger fixed to main runners using appropriate self drilling screws or nut and bolt fixings. Hangers shall be normally spaced at 1200mm centres although alternative spacings are acceptable provided maximum loadings stated above are not exceeded. Hangers to be fixed to structure or soffit using fixings appropriate to the structure or soffit.

Hold down clips: Where applicable, these shall be non removable type clips. These generally will only be required in certain fire protecting assemblies or where there is a risk of tile uplift. Where fitted, these should be applied to all grid members at a rate of 1 clip per 600mm of tile edge.

DONN® DX24 HEAVY DUTY - STANDARD



Materials

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Product Information

Nr	Description	Item reference	
		Metric	Imperial
1	Main Runner	DX3600H	DX3660H30
2	Long Cross Tee	DX1200H30 / DX1200 LM	DX1220H30 / DX 1220LM
3	Short Cross Tee	DX600H30 / DX600LM	DX610H30 / DX610LM
4	Wall Angle	MT3600-MS3600	
5	Hanger	35RHXXXX	

Quantity

Linear meter required per square meter

For construction layouts use the following formulas to calculate linear meters (LM) per square meter (m²)

■ Main tee

(1/ Main Tee centres)

eg. if MT at 1200mm centres $\frac{1}{1.2} = 0.83\text{LM/m}^2$

■ Cross tee

(1/ Cross Tee centres)

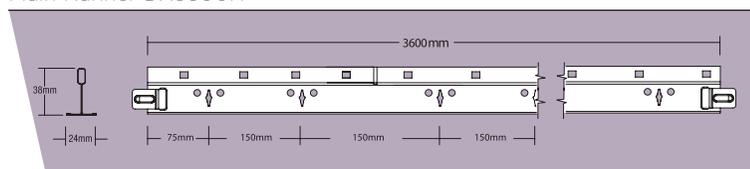
eg. if CT at 600mm centres $\frac{1}{0.60} = 1.67\text{LM/m}^2$

Note: These calculations do not allow for wastage, damage or irregularities but are intended as an informative guideline to assist with the calculation of product required for a given area (in m²)

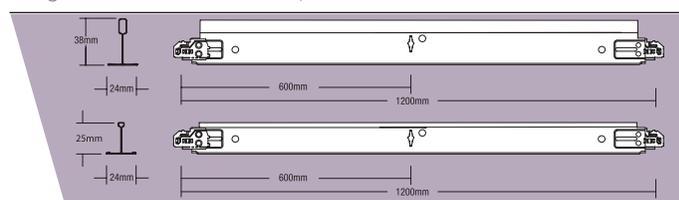
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- Safe, fast and simple to install & easily accessible
- Maximum economy and design simplicity
- Cross-tees with override-ends resist twisting and give professionally finished look with no exposed steel edges
- Patented QUICK-RELEASE™ clip design: demountable without tools
- Compatible with square edge and SLB edge ceiling tiles
- Audible Click means you know when tees are connected
- Exceed load compliance specifications as per ASTM C635
- Available in metric and imperial size

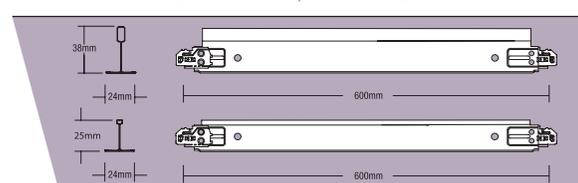
Main Runner DX3600H



Long Cross Tee DX1200H30 / DX1200LM



Short Cross Tee DX600H30 / DX 600LM



Maximum allowed weight of tiles per m² of ceiling

Hanger distance (mm)	Module			
	Main runner at 1200mm		Main runner at 600mm	
800	23.2	23.5	-	-
1000	23.2	23.5	46.8	48.6
1200	12.3	12.4	24.6	25.2
1500	4.5	4.6	9.7	9.9

Note: The load per m² must be distributed uniformly (no point loads) over the ceiling area. After loading, the deflection of any grid component will remain within the maximum deflection per span as stated in BS: 8290: 1991, provided the grid layout is as presented in the sketch.

Please consult USG for other layouts, load or hanger distance.

Specification DONN® DX24-H

Grid shall be DONN® DX24 exposed grid system, hot dipped galvanized steel 'T' section with pre painted capping. Table width 24mm. To suit variable module sizes, most typically 600 x 600mm and 1200 x 600mm. Main runners: 38 x 24mm, ref DX3600H shall be normally spaced at 1200mm centres and suspended from the structure or soffit using pre-straightened 2mm diameter HDG steel wire hangers, at typically 1200mm centres. First hanger shall be no more than 450mm from the perimeter. Main runners joined end on by means of the integral splice. Splice connections shall be supported within 150mm with a hanger, and shall be staggered across the ceiling area.

Cross tees: 1200mm cross tees, 38 x 24mm ref DX 1200H30 and 25 x 24mm ref DX1200LM, shall be installed perpendicular between the main runners at 600 mm centres to form a 1200 x 600mm module. If applicable, 600mm cross tees, 25 x 24mm ref DX600LM and 38 x 24mm ref DX600H30, shall be installed perpendicular between the 1200mm cross tees to form a 600 x 600mm module. All cross tees feature a 'joggled' end detail.

Perimeter trims: 22mm x 19.5mm/19x9x9x19mm painted HDG steel angle trim, ref MT3600/MS3600, fixed to perimeter wall using fixings appropriate to the structure at maximum 450mm centres. Corners shall normally be finished with a lapped or but joint.

Hangers - Seismic Application: Shall be from pre straightened 2mm diameter HDG steel wire, ref 35RHXXXX. Hangers shall be fixed through holes in stalk or bulb of main runner and wrapped around itself a minimum of 3 times. Alternatively, hangers can be formed from ø 3.5mm adjustable rod hanger on 25 x 25mm HDG steel angle section, ref DGA5, fixed to main runners using appropriate self drilling screws or nut and bolt fixings. Hangers shall be normally spaced at 1200mm centres although alternative spacings are acceptable provided maximum loadings stated above are not exceeded. Hangers to be fixed to structure or soffit using fixings appropriate to the structure or soffit.

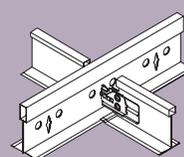
Hold down clips: Where applicable, these shall be non removable type clips. These generally will only be required in certain fire protecting assemblies or where there is a risk of tile uplift. Where fitted, these should be applied to all grid members at a rate of 1 clip per 600mm of tile edge.

Tile edge supported



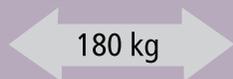
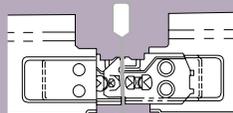
Cross section

Main tee and cross tee connection.



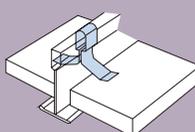
Clip to Clip Security

Clip to Clip Connection



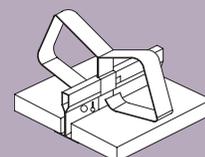
DX24 / revoe clip

Partition head fixing using revoe clips with DX24.

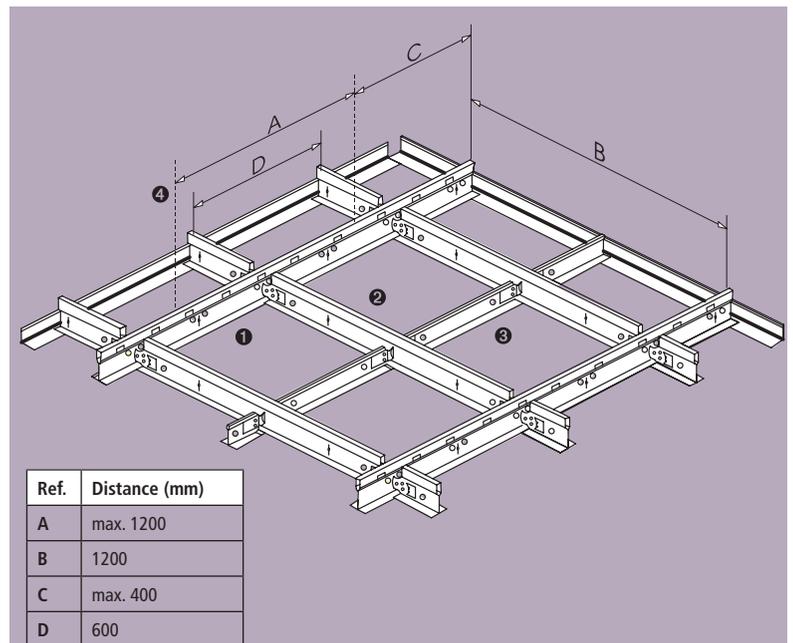
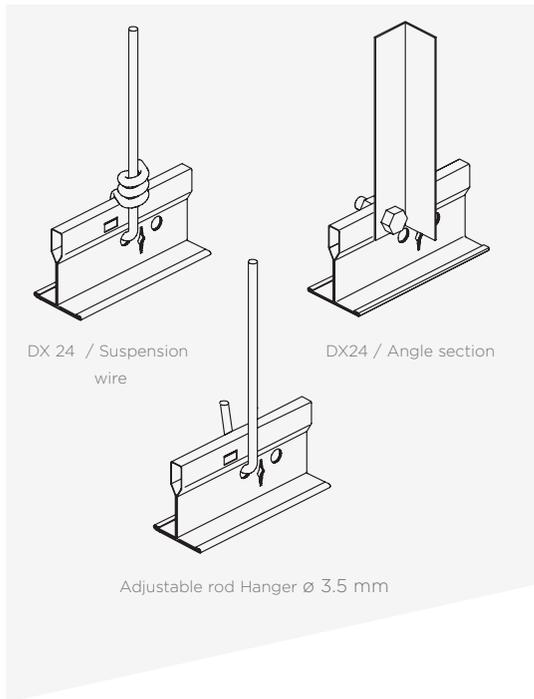


Spring clip

Spring clip application.



DONN® DXL24 HEAVY DUTY - FIRE RATED



Materials

All USG suspension systems feature a body and cap made of hot-dip galvanized steel. To ensure that the cap remains attractive and rust-free for long term, manufacturing includes an exclusive four-step coating process that outperforms the competition in paint adhesion and corrosion resistance, as proven by industry-standard salt spray tests conducted by an independent laboratory. For our extreme environments we offer our grid system, with hot-dipped galvanized steel body and painted aluminum cap for additional corrosion and humidity resistance.

Product Information

Nr	Description	Item reference	
		Metric	Imperial
1	Main Runner	DXL3600	DXL3660
2	Long Cross Tee	DX1200H30	DX1220H30
3	Short Cross Tee	DX600H30	DX610H30
4	Wall Angle	MT3600 - MS3600	
5	Hanger	35RHXXXX	

Quantity

Linear meter required per square meter

For construction layouts use the following formulas to calculate linear meters (LM) per square meter (m²)

■ Main tee

(1/ Main Tee centres)

eg. if MT at 1200mm centres $\frac{1}{1.2} = 0.83\text{LM/m}^2$

■ Cross tee

(1/ Cross Tee centres)

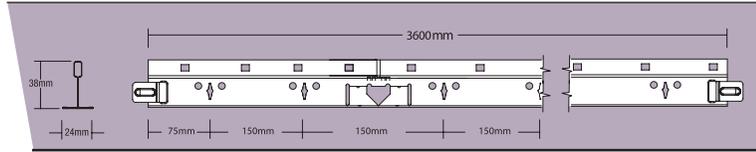
eg. if CT at 600mm centres $\frac{1}{0.60} = 1.67\text{LM/m}^2$

Note: These calculations do not allow for wastage, damage or irregularities but are intended as an informative guideline to assist with the calculation of product required for a given area (in m²)

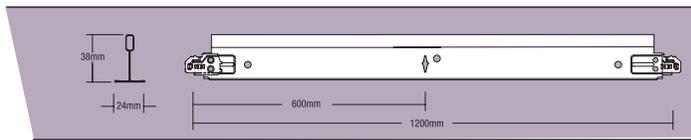
System characteristics:

- Exposed 24mm system
- The most widely used grid system in the world
- Safe, fast and simple to install & easily accessible
- Maximum economy and design simplicity
- Cross-tees with override-ends resist twisting and give professionally finished look with no exposed steel edges
- Patented QUICK-RELEASE™ clip design: demountable without tools
- Compatible with square edge and SLB edge ceiling tiles
- Audible Click means you know when tees are connected
- Exceed load compliance specifications as per ASTM C635
- Available in metric and imperial size

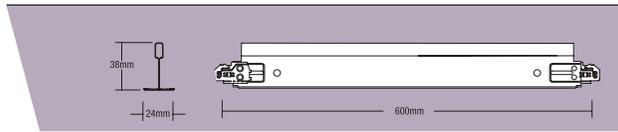
Main Runner DXL3600



Long Cross Tee DX1200H30



Short Cross Tee DX600H30



Maximum allowed weight of tiles per m² of ceiling

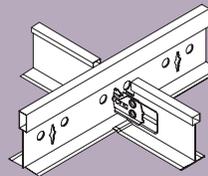
Hanger distance (mm)	Module			
	Main runner at 1200mm		Main runner at 600mm	
	600 x 600	600 x 1200	600 x 600	600 x 1200
800	23.7	23.9	-	-
1000	23.7	23.9	55.9	56.3
1200	12.8	12.9	26.3	26.6
1500	4.6	4.8	10	10.3
<p>Note: The load per m² must be distributed uniformly (no point loads) over the ceiling area. After loading, the deflection of any grid component will remain within the maximum deflection per span as stated in BS: 8290: 1991, provided the grid layout is as presented in the sketch.</p> <p>Please consult USG for other layouts, load or hanger distance.</p>				

Tile edge supported



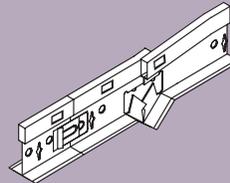
Cross section

Main tee and cross tee connection.



Fire protection

DX main tees are designed to expand at the fire lance in the event of a fire (shown here). This maintains the structural integrity of the ceiling and holds tiles in place.

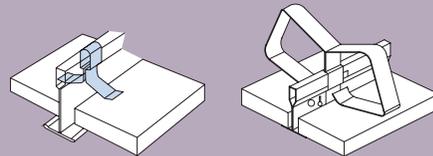


Hold Down Clip

Partition head fixing using revoc clips with DX24.

Spring clip

Spring clip application.



Specification DONN® DXL24

Grid shall be DONN® DX24 exposed grid system, hot dipped galvanised steel 'T' section with pre-painted capping. Table width 24mm. To suit variable module sizes, most typically 600 x 600mm and 1200 x 600mm. Main runners: 38 x 24mm, ref DXL3600 shall be normally spaced at 1200mm centres and suspended from the structure or soffit using pre-straightened 2mm diameter HDG steel wire hangers, at typically 1200mm centres. First hanger shall be no more than 450mm from the perimeter. Main runners joined end on by means of the integral splice. Splice connections shall be supported within 150mm with a hanger, and shall be staggered across the ceiling area.

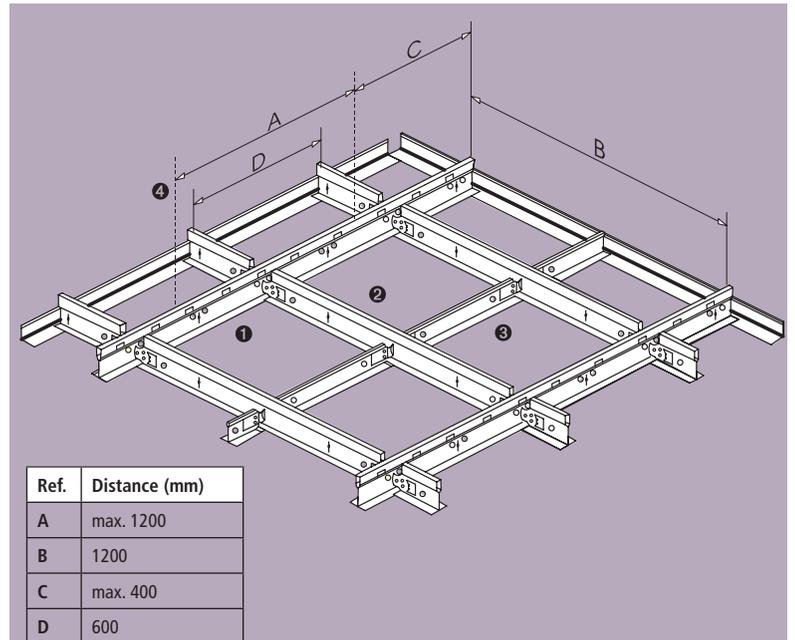
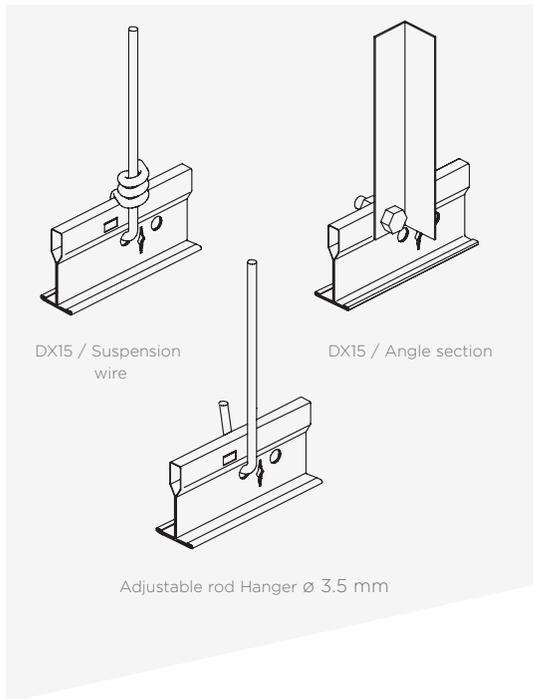
Cross tees: 1200mm cross tees, 38 x 24mm ref DX1200H30, shall be installed perpendicular between the main runners at 600mm centres to form a 1200 x 600mm module. If applicable, 600mm cross tees, 38 x 24mm ref DX600H30 shall be installed perpendicular between the 1200mm cross tees to form a 600 x 600mm module. All cross tees feature a 'joggled' end detail.

Perimeter trims: 22mm x 19.5mm/19x9x9x19mm painted HDG steel angle trim, ref MT3600/MS3600, fixed to perimeter wall using fixings appropriate to the structure at maximum 450mm centres. Corners shall normally be finished with a lapped or butt joint.

Hangers - Seismic Application: Shall be from pre straightened 2mm diameter HDG steel wire, ref 35RHXXXX. Hangers shall be fixed through holes in stalk or bulb of main runner and wrapped around itself a minimum of 3 times. Alternatively, hangers can be formed from 3.5mm adjustable rod hanger on 25 x 25mm HDG steel angle section, fixed to main runners using appropriate self drilling screws or nut and bolt fixings. Hangers shall be normally spaced at 1200mm centres although alternative spacings are acceptable provided maximum loadings stated above are not exceeded. Hangers to be fixed to structure or soffit using fixings appropriate to the structure or soffit.

Hold down clips: Where applicable, these shall be non removable type clips. These generally will only be required in certain fire protecting assemblies or where there is a risk of tile uplift. Where fitted, these should be applied to all grid members at a rate of 1 clip per 600mm of tile edge.

DONN® DX15 CENTRICITEE



Materials

All USG suspension systems feature a body and cap made of hot-dip galvanized steel. To ensure that the cap remains attractive and rust-free for long term, manufacturing includes an exclusive four-step coating process that outperforms the competition in paint adhesion and corrosion resistance, as proven by industry-standard salt spray tests conducted by an independent laboratory. For our extreme environments we offer our grid system, with hot-dipped galvanized steel body and painted aluminum cap for additional corrosion and humidity resistance.

Product Information

Nr	Description	Item reference	
		Metric	Imperial
1	Main Runner	DXT15-3600M	DXT15-3660IM
2	Long Cross Tee	DXT15-1200M	DXT15-1220IM
3	Short Cross Tee	DXT15-600M	DXT15-610IM
4	Wall Angle	M93600-MS3600	
5	Hanger	35RHXXXX	

Quantity

Linear meter required per square meter

For construction layouts use the following formulas to calculate linear meters (LM) per square meter (m²)

■ Main tee

(1/ Main Tee centres)

eg. if MT at 1200mm centres $\frac{1}{1.2} = 0.83\text{LM}/\text{m}^2$

■ Cross tee

(1/ Cross Tee centres)

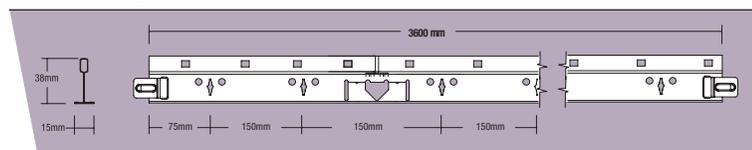
eg. if CT at 600mm centres $\frac{1}{0.60} = 1.67\text{LM}/\text{m}^2$

Note: These calculations do not allow for wastage, damage or irregularities but are intended as an informative guideline to assist with the calculation of product required for a given area (in m²)

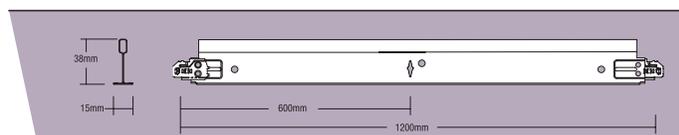
System characteristics:

- Exposed 15mm system
- Narrow table grid for subtle visual effect
- Cross-tees with override-ends resist twisting and give professionally finished look with no exposed steel edges
- Patented QUICK-RELEASE™ clip design: easy to remove without tools
- Safe, fast and simple to install and easily accessible
- Standard joggled (overriding) cross tee system
- Suitable for FLB edge and most "face cut design" ceiling tiles
- Designed for fire rated ceilings
- Lay-on Cross Tees resist twist and gapping • Audible Click means you know when tees are connected
- Exceed load compliance specifications as per ASTM C635
- Available in metric in imperial size

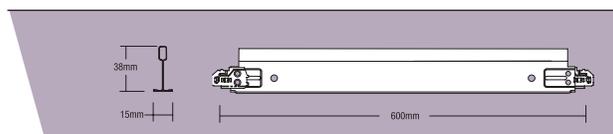
Main Runner DXT15-3600M



Long Cross Tee DXT15-1200M



Short Cross Tee DXT15-600M



Maximum allowed weight of tiles per m² of ceiling

Hanger distance (mm)	Module			
	Main runner at 1200mm		Main runner at 600mm	
	600 x 600	600 x 1200	600 x 600	600 x 1200
800	24.0	24.2	-	-
1000	24.0	24.2	54.0	54.2
1200	12.4	12.5	25.5	25.7
1500	4.5	4.7	9.8	10.0

Note: The load per m² must be distributed uniformly (no point loads) over the ceiling area. After loading, the deflection of any grid component will remain within the maximum deflection per span as stated in BS: 8290: 1991, provided the grid layout is as presented in the sketch.

Please consult USG for other layouts, load or hanger distance.

Specification DONN® DXLT15

Grid shall be DONN® DX24 exposed grid system, hot dipped galvanised steel 'T' section with pre-painted capping. Table width 24mm. To suit variable module sizes, most typically 600 x 600mm and 1200 x 600mm. Main runners: 38 x 15mm, ref DXT15-3600M shall be normally spaced at 1200mm centres and suspended from the structure or soffit using pre-straightened 2mm diameter HDG steel wire hangers, at typically 1200mm centres. First hanger shall be no more than 450mm from the perimeter. Main runners joined end on by means of the integral splice. Splice connections shall be supported within 150mm with a hanger, and shall be staggered across the ceiling area.

Cross tees: 1200mm cross tees, 38 x 15mm ref DXT15-1200M, shall be installed perpendicular between the main runners at 600mm centres to form a 1200 x 600mm module. If applicable, 600mm cross tees, 38 x 15mm ref DXT15-600M shall be installed perpendicular between the 1200mm cross tees to form a 600 x 600mm module. All cross tees feature a 'joggled' end detail.

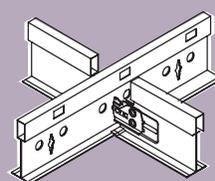
Tile edge supported



DX15 / FL DX15 / FLB

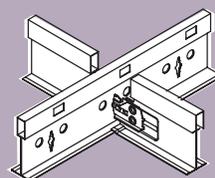
Cross section (joggled)

Main tee and cross tee connection.



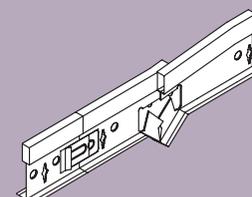
Cross section (butt cut)

Main tee and cross tee connection.



Fire protection

DX main tees are designed to expand at the fire lance in the event of a fire (shown here). This maintains the structural integrity of the ceiling and holds tiles in place.



Perimeter trims: 15mm x 24 mm/19x9x9x19mm painted HDG steel angle trim, ref M93600/MS3600, fixed to perimeter wall using fixings appropriate to the structure at maximum 450mm centres. Corners shall normally be finished with a lapped or butt joint.

Hangers - Seismic Application: Shall be from pre straightened 2mm diameter HDG steel wire, ref 35RHXXXX. Hangers shall be fixed through holes in stalk or bulb of main runner and wrapped around itself a minimum of 3 times. Alternatively, hangers can be formed from 25 x 25mm HDG steel angle section, on ø 3.5mm adjustable rod hanger fixed to main runners using appropriate self drilling screws or nut and bolt fixings. Hangers shall be normally spaced at 1200mm centres although alternative spacings are acceptable provided maximum loadings stated above are not exceeded. Hangers to be fixed to structure or soffit using fixings appropriate to the structure or soffit.

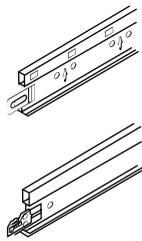
Hold down clips: Where applicable, these shall be non removable type clips. These generally will only be required in certain fire protecting assemblies or where there is a risk of tile uplift. Where fitted, these should be applied to all grid members at a rate of 1 clip per 600mm of tile edge.

DONN® EXPOSED GRID

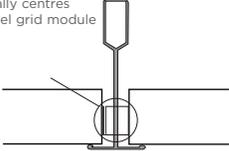
DONN®
CENTRICITEE
15mm
EXPOSED
GRID



15mm Tee System



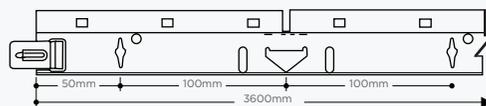
	PROFILE	PRODUCT	PROFILE HEIGHT	COMPONENT LENGTH	THICKNESS	PANEL EDGE OPTIONS
MAIN TEE	 Deep	Main Tee-Centricitee Heavy Duty- Fire Rated	38mm	3600/3660mm	0.38mm	A,B,C,D
CROSS TEE	 Deep	Cross Tee (Heavy) Cross Tee (Heavy)	38mm 38mm	1200mm 600mm	0.30mm	A,B,C,D

	A	B	C	D	
	Square Edge (SQ) ²	Fineline Bevel Edge (FLB)	Fineline (FL)	Interline Tapered (ILT)	Patented self centering device in cross tees automatically centres ceiling panel grid module
USG Panel Edge Detail					

Fire Rated Option

DONN® DXT15 is available only as a Fire Rated option providing protection up to 1 hour, subject to assembly design

Main Tee (Fire Rated)

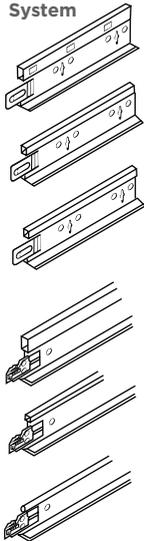


DONN® EXPOSED GRID

DONN® DX
24mm
EXPOSED GRID



24mm Tee System



	PROFILE	PRODUCT	PROFILE HEIGHT	COMPONENT LENGTH	THICKNESS	PANEL EDGE OPTIONS
MAIN TEE	Deep	Heavy-Standard	38mm	3600/3660mm	0.30mm	A,B,C,D
		Fire Rated	38mm	3600/3660mm	0.38mm	A,B,C,D
	Medium	Intermediate Duty	33mm	3600/3660mm	0.30mm	A,B,C,D
	Shallow	Light Duty	29.5 mm	3600/3660mm	0.30mm	A,B,C,D
CROSS TEE	Deep	Fire Rated	38mm	1200/1220mm	0.30mm	A,B,C,D
		Fire Rated	38mm	600/610mm		A,B,C,D
	Medium	Intermediate Duty	33mm	1200/1220mm	0.30mm	A,B,C,D
		Intermediate Duty	33mm	600/610mm		A,B,C,D
	Shallow	Light Duty	25.5mm	1200/1220mm	0.30mm	A,B,C,D
		Light Duty	25.5mm	600/610mm		A,B,C,D

- A** Square Edge (SQ)
- B** Shadowline Tapered (SLT)
- C** Shadowline (SL)
- D** Shadowline Bevel (SLB)

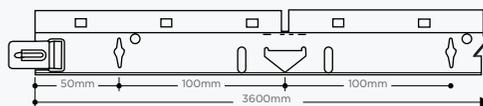
USG Panel Edge Detail



Fire Rated Option

DONN® DXL is available as a Fire Rated option providing protection up to 1 hour, subject to a assembly design

Main Tee (Fire Rated)



USG MIDDLE EAST LIMITED

Loadings - DONN® DX 24mm Exposed Grid

Ceiling Mass - Kg/m²

Use of Maximum Allowable Gross Ceiling Weight Charts:

- Determine the maximum allowable ceiling weight for the chosen Main Tee and hanger spacings from Graph.
- Determine the maximum allowable ceiling weight for the chosen Cross Tee spacing from table.
- The maximum allowable gross weight is the lower of the values from step 1 and 2.
- Note that any heavy lighting, or other mechanical fixtures should be independently supported.
- Siesmic considerations for in-plane loads may take precedence in determining the required section (refer USG Representative for details).

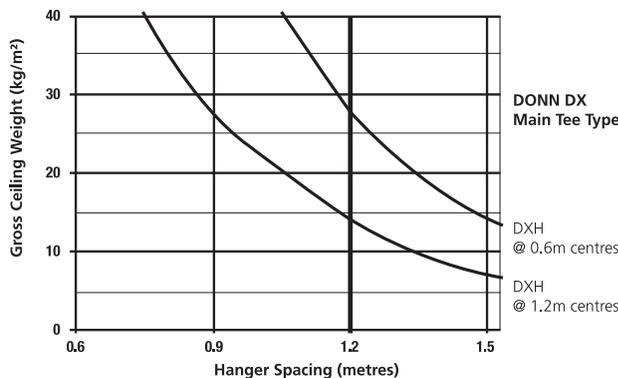
Cross Tees

DONN DX Cross Tee Type	Cross Tee Spacing (m)	
	0.6	1.2
DX600L M	40.0	29.5
DX1200H 30	28.0	14.0
DX1200L M	9.8	4.9

NOTES:

- Values are based on simple span tests in accordance with recognised International Standard ASTM C635. Higher values can often be attained by allowing for the effect of continuous spans, the actual increase being subject to span arrangements. Please contact USG Interiors for guidance.
- For cross-nogged configurations e.g.: where a 1200x600 mm panel runs parallel with the main tee, the spacing values should be used as for 1200x1200mm module.
- Where main tees are at 1200mm centres, creating a 600x600mm configuration does not significantly increase load carrying limits.

Main tees



Uniform Loads - kg/lm (linear metre)

Uniform loads are loads that are transferred evenly along a given tee. The maximum load is the combined load on both sides of the tee.

Example:

A 1200 x 600 light fitting weighing 12.6 kg applies a load of 3.5 kg/lm

(1.2 + 0.6 + 1.2 + 0.6 = 3.6 lm

therefore 12.6 kg / 3.6 lm = 3.5 kg/lm)

A 1200 x 600 ceiling panel weighing 3.6 kg applies a load of 1 kg /lm

The combined load of light and ceiling panel is 4.5 kg/lm.

The maximum allowable uniform load is the lesser of either main or cross tee values.

DONN DX Component	Uniform Load kg/lm
Main Tee	
DX3600H	16.8
DX3600IM	11.6
Cross Tee	
DX600LM	35.4
DX1200LM	16.7
DX1200LM	5.9

* Hanger spacing @ 1.2m centres

Point Loads - kg

Point loads are loads that transfer to a tee at a single point (or several points) over a very small area. The weakest point is assumed to be mid span. main tees are based on a 1200mm span.

The maximum allowable point load is the lesser of either main or cross tee values.

DONN DX Component	Point Load kg
Main Tee	
DX3600H	7.9
DX3600IM*	7.0
Cross Tee	
DX600LM	13.2
DX1200LM	7.9
DX1200LM	4.1

* Hanger spacing @ 1.2m centres

Lighting Installation DONN® DX 24mm Exposed Grid

DONN® DX

As worldwide leaders in acoustical ceiling systems, USG Interior works with the major lighting manufacturers to ensure system compatibility is maintained. The following guidelines are designed to assist in the correct specification and installation of light fittings in USG's DONN® Exposed Grid and acoustical ceiling systems.

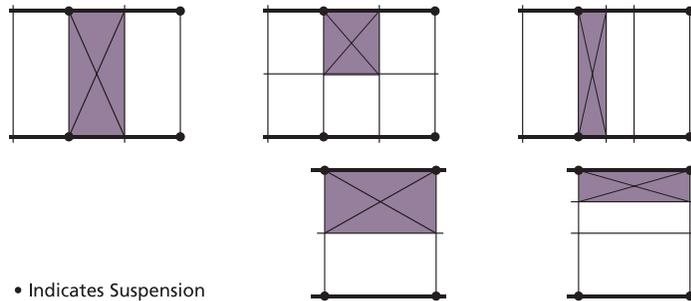
Luminaire Positioning

Typical recessed pan fitting arrangements are shown below. Main Tees at 1200mm centres are shown horizontal, with suspension at 1200mm centres.

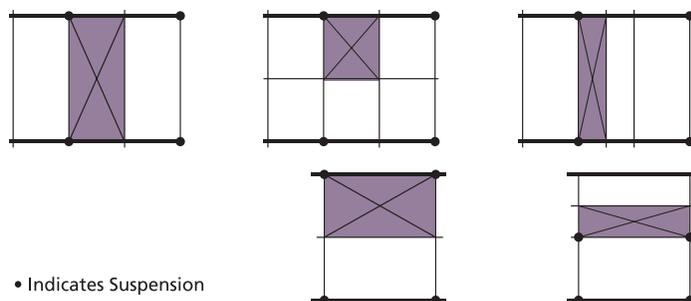
Refer to Loadings (page 108) for maximum allowable point loads, uniform loads and gross ceiling loads depending on type of luminaire and DONN® grid selected.

Where luminaire weight exceeds point or uniform load maximums consider:

- A higher specifications DONN® grid option if applicable (refer to Loadings page 108 this brochure to ensure compliance).
- Independent support from structure.
- Additional suspension points as shown below, or similar.



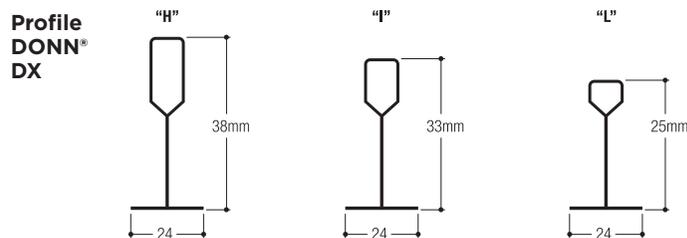
• Indicates Suspension



• Indicates Suspension

DONN® Grid Profiles

When recessed pan fittings use the top of the DONN® tee bulb for support, use the same height tee profiles for even support.

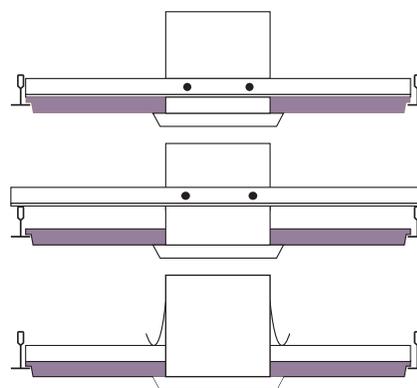


Ceiling panel Mounted Fittings

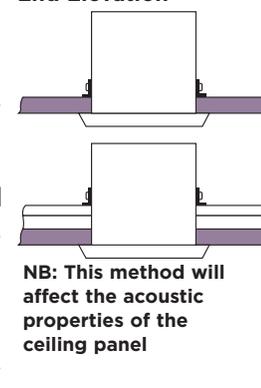
Light fittings mounted through USG acoustical ceiling panels shall not rely on the ceiling panel for support. Their weight shall be transferred back to the grid by:

- Simple supports across the back of the ceiling panel.
- Simple supports onto the top of the tee bulb.
- An additional rigid panel across the back of the ceiling panel.

Side Elevation



End Elevation



NB: This method will affect the acoustic properties of the ceiling panel

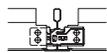
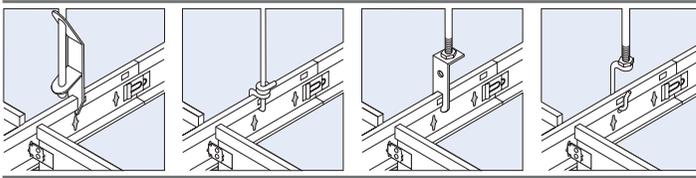
GRID EDGE DETAILS

DONN® DX is the most widely specified grid in Middle East. It includes a wide range of profiles and colours and is fully compatible with all USG ceiling tiles as well as most third party brands. Precision design and quality manufacturing ensure both structural and aesthetic integrity in all ceiling designs.

USG offers the following suspension system and edge details options. Select a suspension details, or vice versa, to assure proper system fit and assembly

Grid system	Edge detail	Square (SQ)	Shadowline Tapered (SLT)	Shadowline (SL)	Fineline (FL)	Pedestal	Shiplap	BESK	Designer (FL)
DONN DX24 DONN DX24K DONN DXE24 Espace									
DONN DX15									
DONN Meridian DXM									
DONN Fineline DXF									
DONN Concealed T, Z									
DONN Concealed C, L									
DONN DX35 DONN DXE35 Espace									
DONN DP									

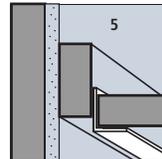
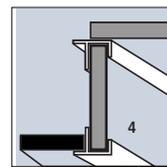
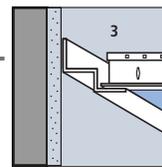
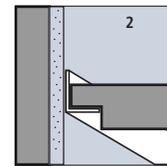
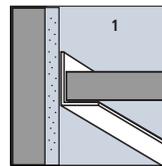
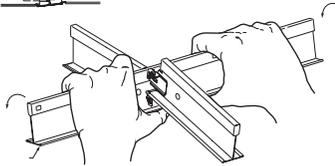
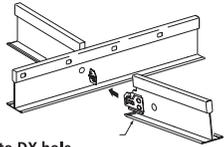
Grid suspension options



Insert into DX hole.



Rotate main tee.



- 1- MI/L Angle with SQ edge.
- 2- L Angle-Standard angle (shown with site cut shadow edge tile).
- 3- MS-Shadowline trim
- 4- M/F Profile-for change of level and bulkheads
- 5- L Angle - Standard angle fixed to timber batten.

System performance

USG ceiling systems should be installed in accordance with recommendations described within this catalogue and the DONN® grid application guide. System performance following any substitution of materials or compromises in assembly cannot be guaranteed and may result in failure under critical conditions. Reference should be made to BS 8290 1991 Suspended Ceilings parts 1, 2 and 3, and the European Standard for Suspended Ceilings BS EN 13964:2004.

Site storage and handling

Storage on site should be as short as possible with environmental conditions as near as possible to those specified for occupancy (see below). Any storage area should be secure and fully protected from the weather with cartons stored on a clean, dry base. Cartons of material should never be rolled, dropped or slid, and under no circumstances used as a workbase or substitute for ladders, scaffolding, etc.

Pattern direction

With directional face patterns, such as Glacier™ and Sandrift™, the orientation of pattern relative to light sources should be carefully considered for desired visual effect, and specified and installed accordingly. Variations in colour and fissure size in Glacier™ and Sandrift™ ceiling tiles will be of little consequence within a single production batch. However, minor variations can occur from time to time, and projects should be planned so that all material for continuous ceiling space is ordered and delivered from the same production batch. Some USG tiles are marked with a directional arrow on the back and should always be installed with this in alignment to ensure total consistency of pattern and paint shade in a Production batch.

Overlaid material

Wherever possible, overlaid material such as insulation, should not be laid directly on the back of the ceiling membrane, as this will compromise the fire resistant properties of the ceilings. In normal conditions (BS 8290), overlaid material should not exceed 3.6kg/m² weight. For high humidity environments, overlaid installation shall be limited to 1.2 kg/m².

Installation/environmental conditions

For applications with normal controlled environmental conditions, products with 70% RH/29°C or better are suitable. Installation should only take place under ambient conditions after residual moisture from concrete and plaster has dissipated. The recommended relative humidity should not exceed 70% RH within a temperature range 65-85°F, 18-29°C for installation and occupancy.

Once ceiling installation has commenced, it is essential that RH% and temperature be maintained at acceptable levels by heating the building if necessary. Dry heating should be employed and paraffin or gas heaters avoided. These recommendations should still be applied between completion of contract and the occupation of the building. Unoccupied buildings with uncontrolled atmospheres may have a wide temperature range during a 24 hour period which could lead to an unacceptable change in dimension stability of the ceiling panels, causing excessive sag. For applications with intermittent heating and cooling systems, products with 90%RH/32°C or better are recommended. (See Humidity selector, page 15.) For applications with uncontrolled environmental conditions, natural ventilation systems or in humid areas such as washrooms, kitchens or wet process areas, products with 95-99%RH/40°C or better are recommended. (See Humidity selector, page 15.) Radar Ceramic™ and Sonatone ceiling panels perform especially well in areas such as swimming pools, where the ceiling may be subject to unusually high levels of humidity up to 100% RH and chemical attack. They should be installed with USG DONN® Corrosion Resistant ceiling grid and appropriate hangers to resist corrosion.

All USG tiles should be protected from sustained direct contact with water except the treated one as water shield.

Maintenance and cleaning

General cleaning of dust and loose dirt may be easily achieved using a soft brush or vacuum cleaner. Soiled panels can be cleaned with an art gum eraser or dampened cloth or sponge containing as little water as possible.

Clean Room™ tiles can be wet wiped on a regular basis without damage.

Panels should never be soaked or immersed in water.

Cleaning can also be carried out by specialist contractors using proprietary methods and chemicals. It is strongly recommended that a trial area be cleaned to ensure that there is no detrimental effect on the ceiling panel or grid.

Re-decoration

It should be noted that a new paint finish may compromise the Surface Spread of Flame classification and acoustic absorption for that panel.

Please consult the USG Technical Services Department for expert advice and recommendations.

Custom products

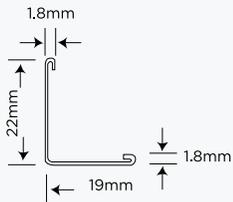
In addition to a wide standard range, USG can satisfy specifiers' needs for non-standard, specialised ceilings. Please talk to your local USG representative to arrange production of your specific ideas.

WALL ANGLES

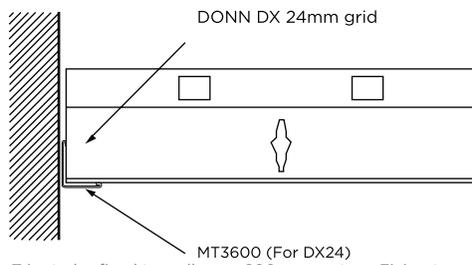
System Components

Construction Details

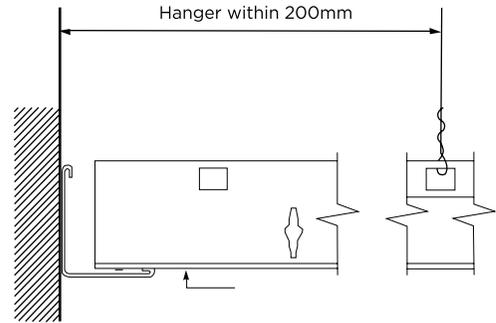
STANDARD Pre-Painted Steel (MT3600)



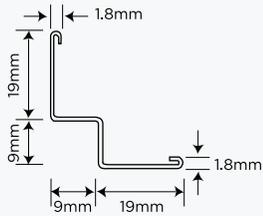
STANDARD



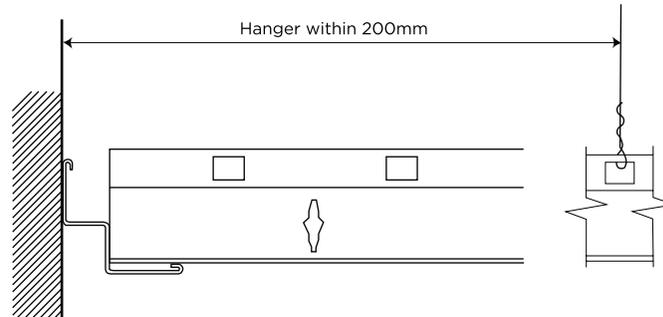
Trim to be fixed to wall, max 600mm centres. Fixing to be relevant to wall strata eg plug and screw or suitable nail type fixings.



SHADOWLINE Pre-Painted Steel (MS3600)

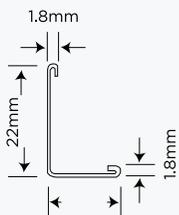


SHADOWLINE

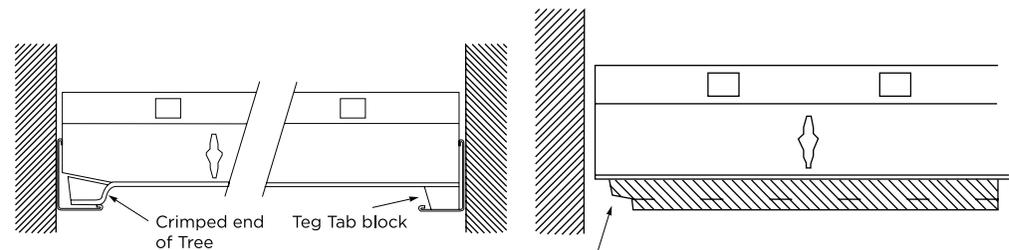


MS3600
Shadowline trim fixed to the perimeter wall, max 600mm centres as for standard trim

CENTRICITEE Pre-Painted Steel (M9-3600)



SHADOWLINE



Cut, then form end with 6mm or 10mm crimping tool to suit depth of rebate on ceiling panel. When setting out ceiling plane, Lower wall angle accordingly to allow for these.

Trimmed perimeter panels hand rebated to match original rebate.

Guide Specification

09120

Part 2 – Products | 2.01 System Description

Acoustical ceiling suspension system[s] conforming to ASTM C635 supplied by USG Middle East Products, 2nd industrial city of Dammam, Saudi Arabia.

2.02 Materials

1. Web (Body) material: Hot Dipped Galvanized (HDG) steel to ASTM A635/A635M.
2. Cap material: Pre-painted Galvanized Steel or Aluminium
3. Finish on exposed cap surface:
 - a. Standard Painted finishes: DONN® Weiss white 10 - White- Blanc 137. Gloss level to be 15% +/- 5%.
4. Suspension system[s]:
 - a. Non-rated 15/16" (24mm) exposed two directional suspension system,
 - i. USG DONN® DX24 intermediate duty system
 - ii. USG DONN® DX24 Heavy duty System
 - iii. Module size to be 600x 600mm; 610 x 610mm; 600 x 1,200mm; 610 x 1,220mm; 750 x 1500mm; 762.5 x 1,525mm
 - b. Fire-rated 15/16" (24mm) exposed two directional suspension system certified and tested according to UL 263.
 - i. USG DONN® DXL24, Heavy Duty-fire Rated System
 - ii. Module size to be 600x 600mm; 610 x 610mm; 600 x 1,200mm; 610 x 1,220mm; 750 x 1500mm; 762.5 x 1,525mm
 - c. Fire-rated 9/16" (15mm) exposed two directional suspension system certified and tested according to UL 263.
 - i. USG DONN® DXLT15 Centricities, Heavy Duty fire rated systems.
 - ii. USG DONN® DXLF Finline, Heavy Duty fire rated systems
 - iii. Module size to be 600x 600mm; 610 x 610mm; 600 x 1,200mm; 610 x 1,220mm; 750 x 1500mm; 762.5 x 1,525mm
 - d. 15/16" (24mm) DONN® DX/DXL Concealed suspension system.
5. Main runner: 1.5" (38mm) high inverted tee section of double web and cap design. Integral and reversible splice detail located at each end. Convenience holes located in the rectangular top bulb on 2.25" centers and include fire expansion notch for fire-rated main runners. Main runner length to be:
 - a. 3600mm with cross tee and hanger holes 75mm from each end and 150mm on centre.
 - b. 3660mm with cross tee and hanger holes 76.25mm from each end and 152.5mm on centre.
6. Cross Tee:
 - a. 1.5" (38mm) high inverted tee section of double web and cap design.
 - b. 1.3" (33mm) intermediate inverted tee section of double web and cap design.
 - c. 1.0" (25mm) Shallow inverted tee section of double web and cap design.
 - d. End detail to be stepped override design to resist twisting and provide an aesthetic hairline joint. End detail to include integral locking device for straight-in insertion and removal. Cross tee length to be:
 - i. 1200mm with cross tee and hanger holes at mid point
 - ii. 1200mm with cross tee and hanger holes at mid point
 - iii. 600 and 610mm short cross Tees
7. Angle Moldings:
 - a. Wall Angle size 22 x 19 x 3600mm long with finish on exposed surface
 - b. Wall Angle size 24 x 14 x 3600mm long with finish on exposed surface
 - c. Shadowline size 19 x 9 x 9 x 3600mm long with finish on exposed surface
8. Accessories:
 - a. Hanger wire. No. 12 gauge (2.7mm) galvanized, soft annealed, mild steel wire with a yield load not less than 3 times the specified (unfactored or working) design load.

DONN® Suspension System

Seismic Solutions

Categories D, E, and F Category C

Since 1957 DONN® brand suspension systems have set the standard, using the strongest gauge steel to produce the tightest systems available with the greatest lateral and torsional stiffness. Building on this commitment to quality, USG teamed with the University at Buffalo (SUNY), the Department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley to conduct full-scale seismic testing to evaluate and qualify the seismic performance of these systems. This testing proved that DONN® suspension systems provide a superior code-compliant solution to meeting International Building Code (IBC) requirements, including installations in Categories D, E and F, and Category C. USG is the only manufacturer to team with two separate earthquake engineering laboratories to qualify the performance of our systems.

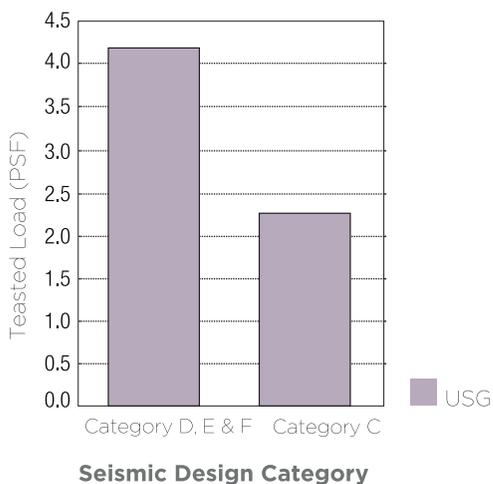
When seismic requirements are a critical design issue, architects, contractors and building officials can rely on DONN® suspension systems to:

- Meet or exceed all national code requirements with 7/8" wall molding.
- Fulfill requirements for IBC seismic design categories C, D, E, and F.
- Provide evidence of compliance (and greatly exceed) ICC Evaluation Service, Inc. (ICC-ES) AC156 and AC308 requirements.
- Offer an aesthetically attractive option to traditional 2" angle molding.
- Provide approved solutions certified with the maximum sq. ft. weights accommodating complete ceilings systems.
- Offer compliant systems tested and verified by two separate earthquake engineering laboratories.
- Offer a seismic clip laboratory-tested to greatly exceed all structural requirements including tension, compression and tee fallout.

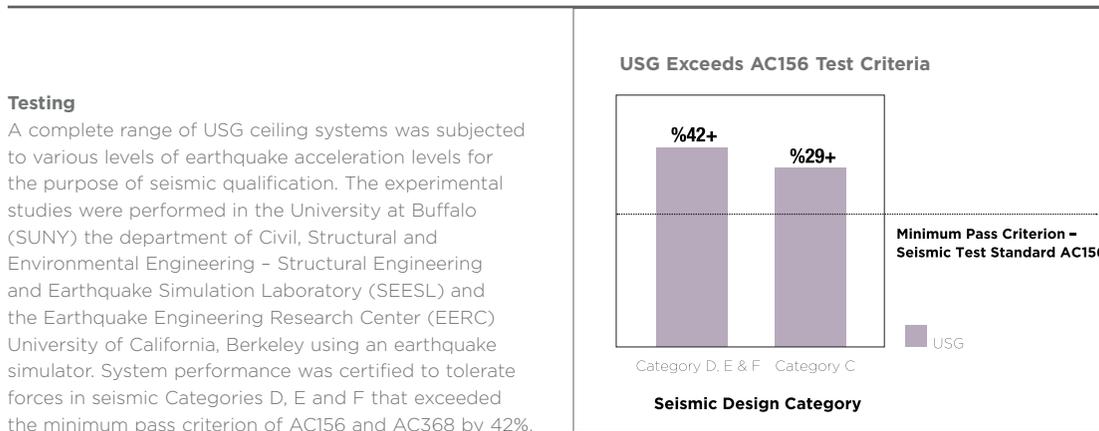
Seismic Qualification / Specifications

Seismic testing typically focuses primarily on the suspension system itself. Any ceiling panel can be installed in the test assembly regardless of how little it weighs, and components such as light fixtures and air handling equipment are usually excluded. In practical application, however, the suspension system must support and carry the weight of a fully functional ceiling system, including ceiling panels that can weigh as much as 2 lb./sq. ft. Therefore, USG tested suspension systems with weights commensurate with those found in real-world installations, including light fixtures and air handling equipment, using a wide variety of the ceiling panels that USG offers. Full-scale testing performed at the University at Buffalo (SUNY) the department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley certifies that USG IBC-compliant assemblies are able to accommodate loads commensurate with those found in real-world installations.

Maximum Ceiling System Weight Tested



The USG figures presented are based on full-scale testing and evaluation performed at the University at Buffalo (SUNY) the department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley. Comparative data obtained from public sources includes ICC-ES Reports, product literature and Web sites.



Testing per ICC Evaluation Service, Inc. (ICC-ES) AC156 and AC368:

SYSTEM DESIGN	Seismic Design Category	Maximum Ceiling System Weight Tested	Allowed Suspension System Load Carrying Capacity	Test Result
System DXL-H	D, E, F	2.50 lbs./sq.ft.	Heavy Duty	Passed
System DXL-I-C	C	2.27 lbs./sq.ft.	Intermediate Duty	Passed

With these certified IBC-compliant assemblies, USG is the only manufacturer to offer:

- A seismic system that exceeds the minimum pass criterion of AC156 and AC368 by more than 42%.
- Seismic-system weights commensurate with typical ceiling systems.
- A seismic clip laboratory-tested to greatly exceed all structural and seismic requirements including tension, compression and tee fallout.
- Compliant systems tested and verified by two separate earthquake engineering laboratories.

DONN® Suspension System

Seismic Solutions

Seismic Test Results

Since 1957 DONN® brand suspension systems have set the standard, using the strongest gauge steel to produce the tightest systems available with the greatest lateral and torsional stiffness. Building on this commitment to quality, USG teamed with the University at Buffalo (SUNY), the Department of Civil, Structural and Environmental Engineering - Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley to conduct full-scale seismic testing to evaluate and qualify the seismic performance of these systems. This testing proved that DONN® suspension systems provide a superior code-compliant solution to meeting International Building Code (IBC) requirements, including installations in Categories D, E and F, and Category C. USG is the only manufacturer to team with two separate earthquake engineering laboratories to qualify the performance of our systems.

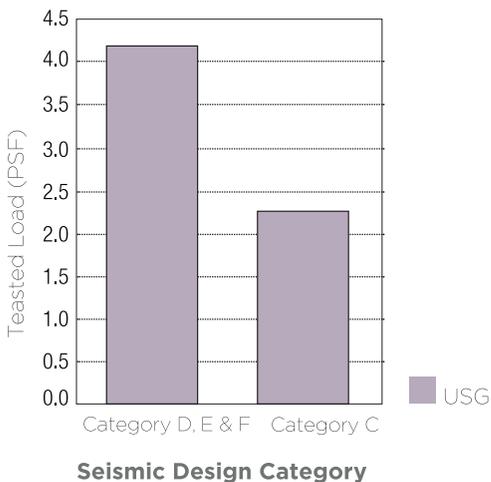
When seismic requirements are a critical design issue, architects, contractors and building officials can rely on DONN® suspension systems to:

- Meet or exceed all national code requirements with 7/8" wall molding.
- Fulfill requirements for IBC seismic design categories C, D, E, and F.
- Provide evidence of compliance (and greatly exceed) ICC Evaluation Service, Inc. (ICC-ES) AC156 and AC308 requirements.
- Offer an aesthetically attractive option to traditional 2" angle molding.
- Provide approved solutions certified with the maximum sq. ft. weights accommodating complete ceilings systems.
- Offer compliant systems tested and verified by two separate earthquake engineering laboratories.
- Offer a seismic clip laboratory-tested to greatly exceed all structural requirements including tension, compression and tee fallout.

Seismic Qualification / Specifications

Seismic testing typically focuses primarily on the suspension system itself. Any ceiling panel can be installed in the test assembly regardless of how little it weighs, and components such as light fixtures and air handling equipment are usually excluded. In practical application, however, the suspension system must support and carry the weight of a fully functional ceiling system, including ceiling panels that can weigh as much as 2 lb./sq. ft. Therefore, USG tested suspension systems with weights commensurate with those found in real-world installations, including light fixtures and air handling equipment, using a wide variety of the ceiling panels that USG offers. Full-scale testing performed at the University at Buffalo (SUNY) the department of Civil, Structural and Environmental Engineering - Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley certifies that USG IBC-compliant assemblies are able to accommodate loads commensurate with those found in real-world installations.

Maximum Ceiling System Weight Tested

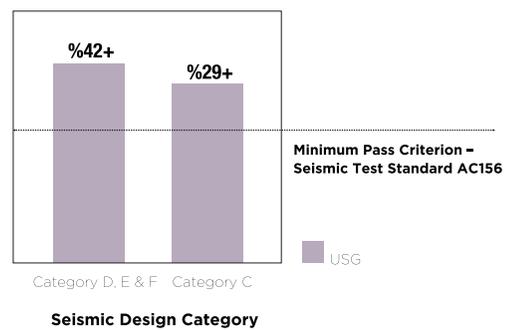


The USG figures presented are based on full-scale testing and evaluation performed at the University at Buffalo (SUNY) the department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley. Comparative data obtained from public sources includes ICC-ES Reports, product literature and Web sites.

Testing

A complete range of USG ceiling systems was subjected to various levels of earthquake acceleration levels for the purpose of seismic qualification. The experimental studies were performed in the University at Buffalo (SUNY) the department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley using an earthquake simulator. System performance was certified to tolerate forces in seismic Categories D, E and F that exceeded the minimum pass criterion of AC156 and AC368 by 42%.

USG Exceeds AC156 Test Criteria



Testing per ICC Evaluation Service, Inc. (ICC-ES) AC156 and AC368:

SYSTEM DESIGN	Seismic Design Category	Maximum Ceiling System Weight Tested	Allowed Suspension System Load Carrying Capacity	Test Result
System DXL-H	D, E, F	2.50 lbs./sq.ft.	Heavy Duty	Passed
System DXL-I-C	C	2.27 lbs./sq.ft.	Intermediate Duty	Passed

With these certified IBC-compliant assemblies, USG is the only manufacturer to offer:

- A seismic system that exceeds the minimum pass criterion of AC156 and AC368 by more than 42%.
- Seismic-system weights commensurate with typical ceiling systems.
- A seismic clip laboratory-tested to greatly exceed all structural and seismic requirements including tension, compression and tee fallout.
- Compliant systems tested and verified by two separate earthquake engineering laboratories.

Code Approval

Testing and evaluation performed at the University at Buffalo (SUNY), the Department of Civil, Structural and Environmental Engineering – Structural Engineering and Earthquake Simulation Laboratory (SEESL) and the Earthquake Engineering Research Center (EERC) University of California, Berkeley qualify the performance of these systems according to the AC156 – Seismic Qualification Specification, and AC368 – Acceptance Criteria for Suspended Ceiling Framing Systems. Several alternative materials, designs and methods of construction were evaluated and tested. Results of this investigation indicate that these tested alternative designs are at least the equivalent of that prescribed in the code for quality, strength, effectiveness, fire resistance, durability and safety. The data and test results presented provide technical evidence on which a code official can base approval. Construction details for these systems are shown on the following pages.

DONN® Suspension System

Seismic Solutions

Categories D, E, and F Category C

Seismic Test Results

	System DXL-H	System DXL-I-C
Seismic Category	D, E, F	D, E, F
Suspension System	DONN® double-web, galvanized steel meeting or hot-dipped exceeding ASTM C635	DONN® double-web, hot-dipped galvanized steel meeting or exceeding ASTM C635
Duty rating	Heavy Duty	Intermediate Duty
Wall molding	7/8"	7/8"
Seismic Clip	ASM7	ASM7
Shake Table	Six degrees of freedom	Six degrees of freedom
Test Protocol	Simulated earthquake	Simulated earthquake
Qualification	AC156 and AC368	AC156 and AC368
Result	Passed	Passed
Minimum Acceleration Requirement	Exceeds by 42%	Exceeds by 29%
Two Adjacent Floating Sides - With Gap	Fastener attachment to tee through slot (optional), no fastener through wall molding	Fastener attachment to tee through slot (optional), no fastener through wall molding
Two Adjacent Fixed Sides - Tight, No Gap	Fastener attachment to tee (optional), one fastener through wall molding (optional)	Fastener attachment to tee (optional), one fastener through wall molding (optional)
Perimeter Wires	Yes	No
Stabilizer Bars	No	No
System Weight	2.50 lbs./sq.ft.	2.27 lbs./sq.ft.

Convenience holes located in the tee bulb may be used for any and all hanger wires. Load tests performed on 12-gauge hanger wires through convenience holes found the failure to be in excess of 400 lbs. This far exceeds the required 200 lbs. The performance of DONN® seismic systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended.

Systems Summary

	Category D,E,F	
	Alternate Seismic Application	Standard Seismic Application
	DXL-H	
	Heavy Duty DXL-H System 7/8" Molding	Heavy Duty System 2" Molding
Suspension System Duty Rating	Heavy	Heavy
Wall Molding	7/8"	2"
Seismic Clip	ASM7	None
Two Adjacent Floating Sides - With Gap	ACM7 seismic clip with fastener attachment to tee through slot (optional), and no fastener through wall molding	No attachment of tee to molding
Two Adjacent Fixed Sides - Tight, No Gap	ACM7 seismic clip with fastener attachment to tee (optional), and one fastener through wall molding (optional)	Pop-rivet attachment of tee to molding
Perimeter Hanger Wires	Yes	Yes
Stabilizer Bars	None	Yes

	Category C	
	Alternate Seismic Application	Standard Seismic Application
	DXL-I-C	
	Intermediate Duty System 7/8" Molding	Intermediate Duty System 7/8" Molding, Stabilizer Bars
Suspension System Duty Rating	Intermediate	Heavy
Wall Molding	7/8"	2"
Seismic Clip	ACM7	None(unless utilized in lieu of stabilizer bar)
Floating Sides - 3/8" Gap	ACM7 seismic clip with fastener attachment to tee through slot (optional), and one fastener through wall molding and one fastener through wall molding (optional)	No attachment of tee to molding
Perimeter Hanger Wires	None	None
Stabilizer Bars	None	Yes

All main DONN® suspension systems – DX*/DXL™, Finline® DXF™, Finline® 1/8 DXFF™, Centricitee™ DXT™/DXLT™, CE™, DXW™, DXLA™, and ZXLA™ – include the code-compliant intermediate-duty and heavy-duty main tees for Seismic Design Categories C, D, E, and F.

For ceiling areas exceeding 2,500 ft.2 (232 m2), a seismic separation joint may be required. See SC2496 for information on seismic separation joints.

The performance of DONN® seismic systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended.

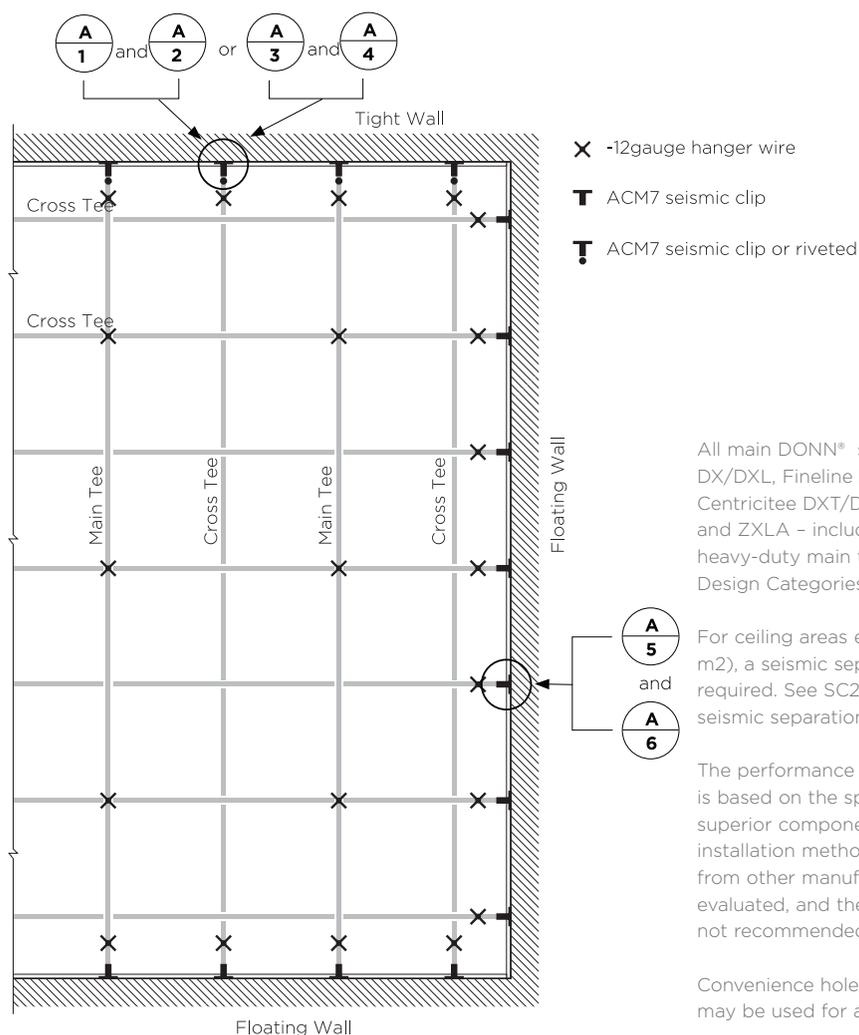
Convenience holes located in the tee bulb may be used for any and all hanger wires.

DONN® Suspension System Seismic Solutions Categories D, E, and F Category C

System Summary

Suspension System Duty Rating	Heavy
Wall Molding	7/8"
Seismic Clip	ASM7
Two Adjacent Floating Sides - With Gap	3/49 gap; ACM7 seismic clip with fastener attachment to tee through slot (optional), and no fastener through wall molding.
Two Adjacent Fixed Sides - Tight, No Gap	Tight, no gap; ACM7 seismic clip with fastener attachment to tee (optional), and one fastener through wall molding (optional)
Perimeter Hanger Wires	Yes
Stabilizer Bars	None

Construction Details



Systems Summary

Category D,E,F		
	Alternate Seismic Application	Standard Seismic Application
DXL-H		
	Heavy Duty DXL-H System 7/8" Molding	Heavy Duty System 2" Molding
Suspension System Duty Rating	Heavy	Heavy
Wall Molding	7/8"	2"
Seismic Clip	ASM7	None
Two Adjacent Floating Sides - With Gap	ACM7 seismic clip with fastener attachment to tee through slot (optional), and no fastener through wall molding	No attachment of tee to molding
Two Adjacent Fixed Sides - Tight, No Gap	ACM7 seismic clip with fastener attachment to tee (optional), and one fastener through wall molding (optional)	Pop-rivet attachment of tee to molding
Perimeter Hanger Wires	Yes	Yes
Stabilizer Bars	None	Yes

Category C		
	Alternate Seismic Application	Standard Seismic Application
DXL-I-C		
	Intermediate Duty System 7/8" Molding	Intermediate Duty System 7/8" Molding, Stabilizer Bars
Suspension System Duty Rating	Intermediate	Heavy
Wall Molding	7/8"	2"
Seismic Clip	ACM7	None(unless utilized in lieu of stabilizer bar)
Floating Sides - 3/8" Gap	ACM7 seismic clip with fastener attachment to tee through slot (optional), and one fastener through wall molding and one fastener through wall molding (optional)	No attachment of tee to molding
Perimeter Hanger Wires	None	None
Stabilizer Bars	None	Yes

All main DONN® suspension systems - DX®/DXL™, Finline® DXF™, Finline® 1/8 DXFF™, Centricitee™ DXT™/DXLT™, CE™, DXW™, DXLA™, and ZXLA™ - include the code-compliant intermediate-duty and heavy-duty main tees for Seismic Design Categories C, D, E, and F.

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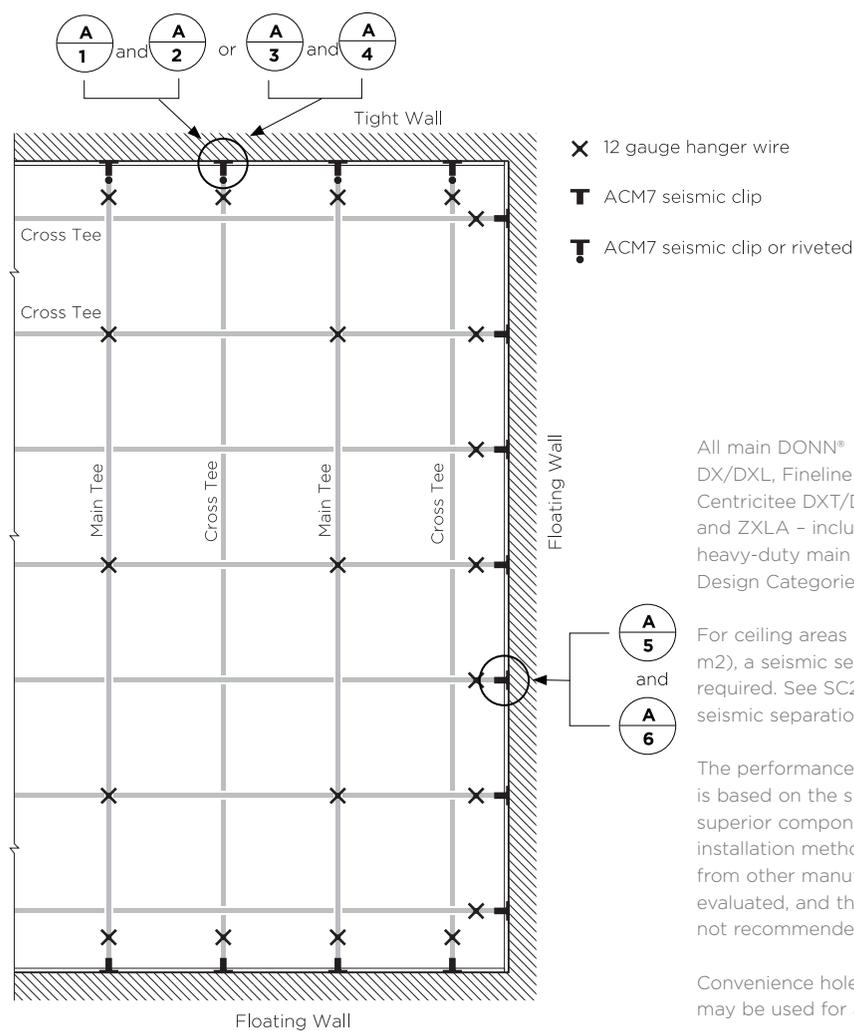
Convenience holes located in the tee bulb may be used for any and all hanger wires.

DONN[®] Suspension System Seismic Solutions Categories D, E, and F Category C

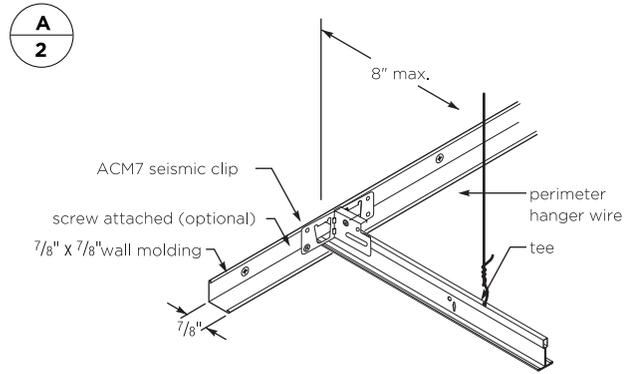
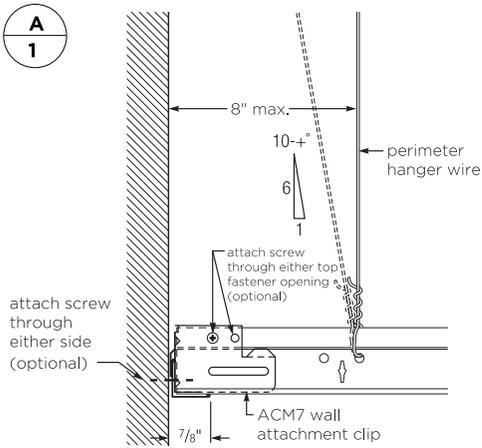
System Summary

Suspension System Duty Rating	Heavy
Wall Molding	7/8"
Seismic Clip	ASM7
Two Adjacent Floating Sides - With Gap	3/49 gap; ACM7 seismic clip with fastener attachment to tee through slot (optional), and no fastener through wall molding.
Two Adjacent Fixed Sides - Tight, No Gap	Tight, no gap; ACM7 seismic clip with fastener attachment to tee (optional), and one fastener through wall molding (optional)
Perimeter Hanger Wires	Yes
Stabilizer Bars	None

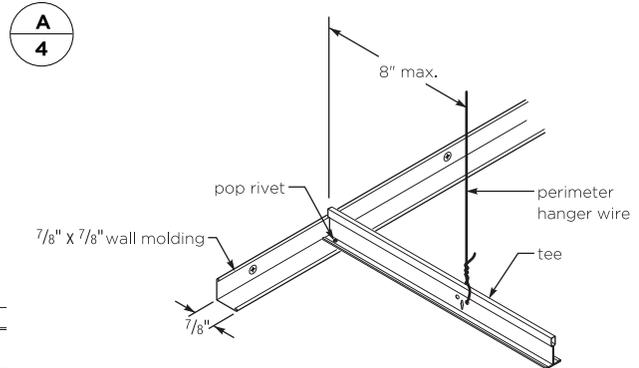
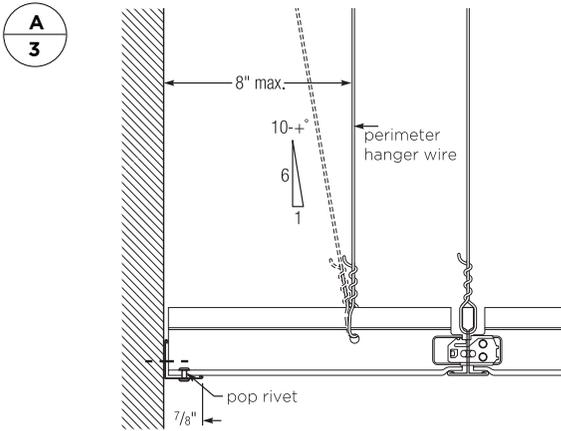
Construction Details



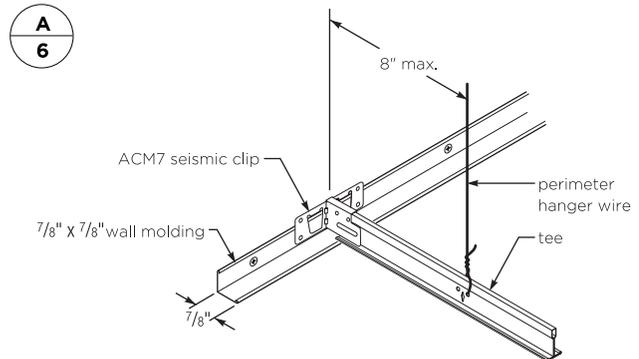
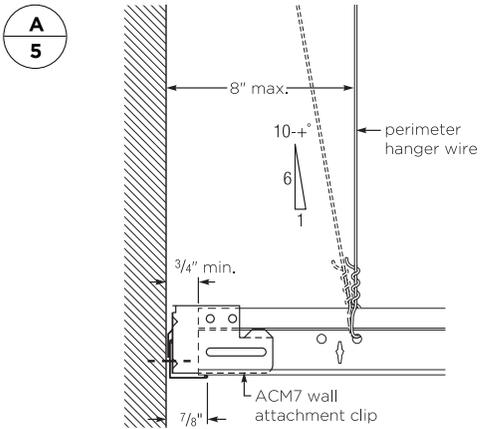
ACM7 Clip, Tight Wall



Tee Rivet, Tight Wall



ACM7 Clip, Tight Wall

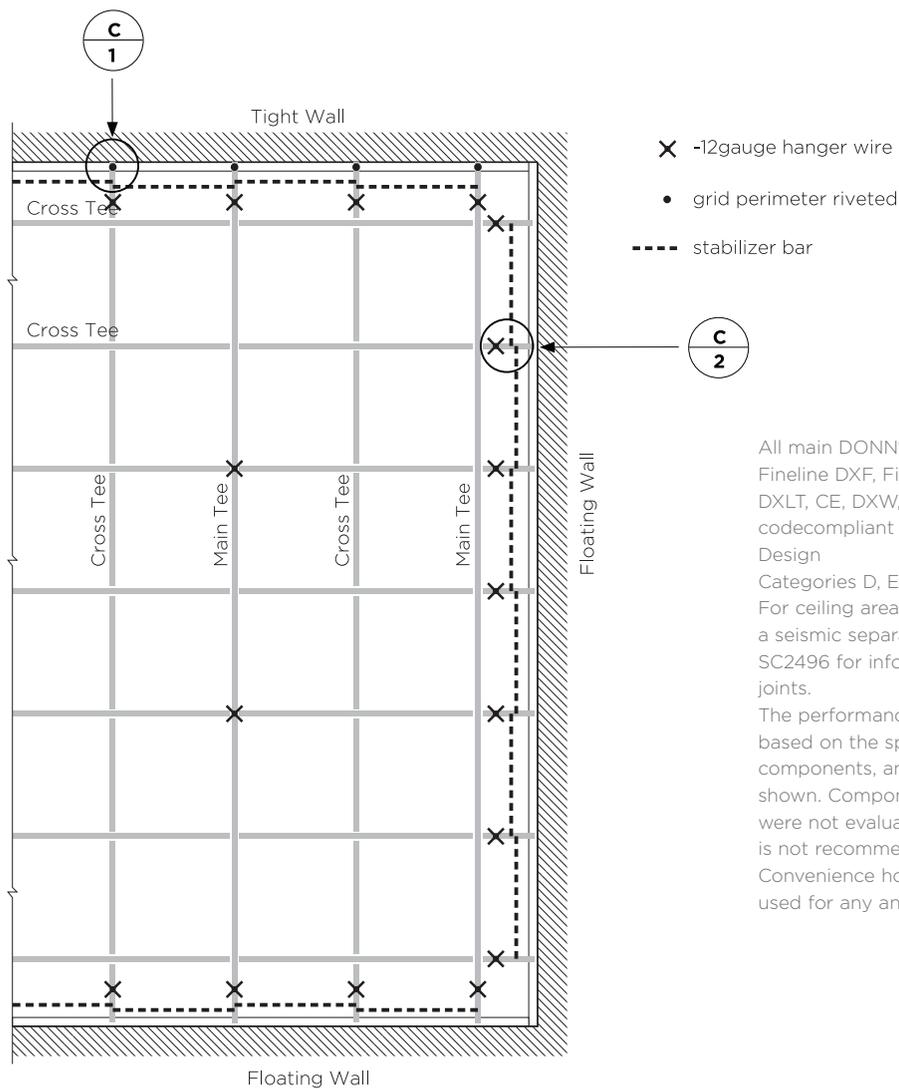


DONN® Suspension System Seismic Solutions Categories D, E, and F Category C

System Summary

Suspension System Duty Rating	Heavy
Wall Molding	2"
Seismic Clip	None (unless utilized in lieu of stabilizer bars)
Two Adjacent Floating Sides - With Gap	3/4" gap; no attachment of tee to molding
Two Adjacent Fixed Sides - Tight, No Gap	Tight, no gap; pop-rivet attachment of tee to molding
Perimeter Hanger Wires	Yes
Stabilizer Bars	Yes

Construction Details



All main DONN® suspension systems – DX/DXL, Finline DXF, Finline 1/8 DXFF, Centricitee DXT/DXLT, CE, DXW, DXLA, and ZXLA – include the codecompliant heavy-duty main tees for Seismic Design

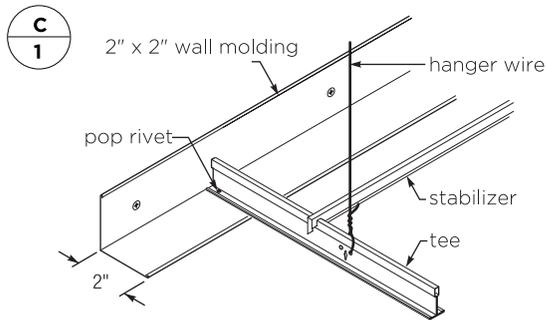
Categories D, E, and F.

For ceiling areas exceeding 2,500 ft.2 (232 m2), a seismic separation joint may be required. See SC2496 for information on seismic separation joints.

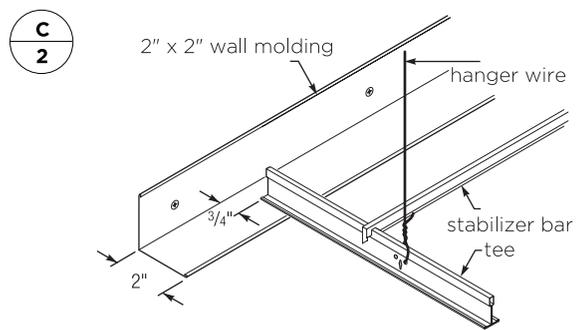
The performance of DONN® seismic systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended.

Convenience holes located in the tee bulb may be used for any and all hanger wires.

Pop Rivet, Tight Wall



Tee Unattached, Floating Wall

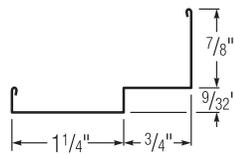
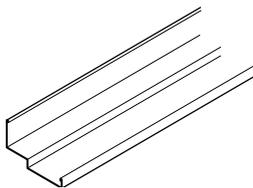


2\"/>

With a 3/4\"/>

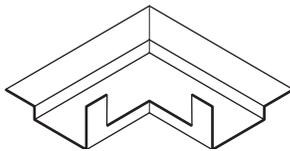
MS274

Profile

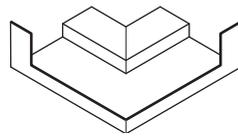


Preformed corners are available, eliminating the need to miter this molding.

Inside Corner Molding



Outside Corner Molding



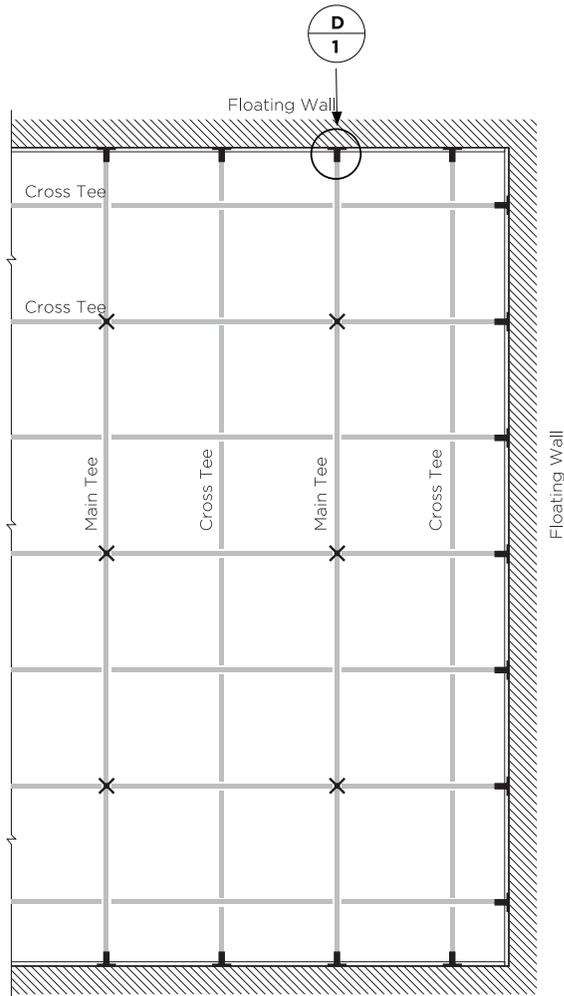
For more information about the MS274 2\"/>

Category C Alternate Seismic Application Intermediate Duty DXL-I-C System 7/8" Molding

System Summary

Suspension System Duty Rating	Intermediate
Wall Molding	7/8"
Seismic Clip	ACM7
Two Adjacent Floating Sides - With Gap	ACM7 seismic clip with fastener attachment to tee through slot (optional), and one fastener through wall molding (optional).
Two Adjacent Fixed Sides - Tight, No Gap	Tight, no gap; pop-rivet attachment of tee to molding
Perimeter Hanger Wires	None
Stabilizer Bars	None

Construction Details



✕ -12gauge hanger wire

⊔ ACM7 seismic clip

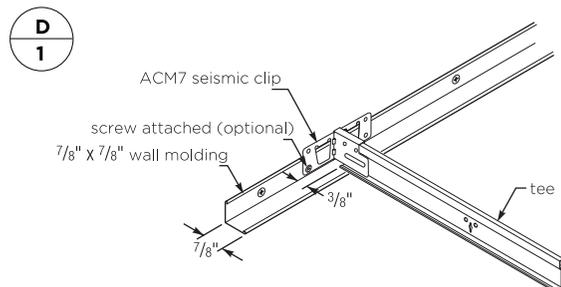
All main DONN® suspension systems - DX/DXL, Fineline DXF, Fineline 1/8 DXFF, Centricitee DXT/DXLT, CE, DXW, DXLA, and ZXLA - include the codecompliant intermediate-duty main tees for Seismic Design Categories A, B and C.

The performance of DONN® seismic systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended.

Convenience holes located in the tee bulb may be used for any and all hanger wires.

Alternate Seismic Application

ACM 7 Clip, Floating Walls

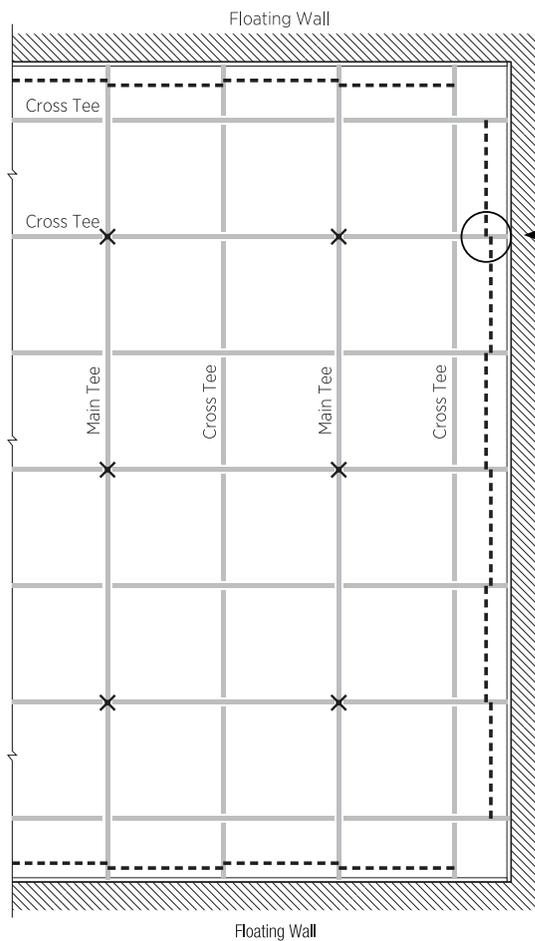


Category C Standard Seismic Application Intermediate Duty System 7/8" Molding, Stabilizer Bars

System Summary

Suspension System Duty Rating	Intermediate
Wall Molding	7/8"
Seismic Clip	None
Floating Sides	3/8" gap; no attachment of tee to molding
Perimeter Hanger Wires	None
Stabilizer Bars	Yes

Construction Details

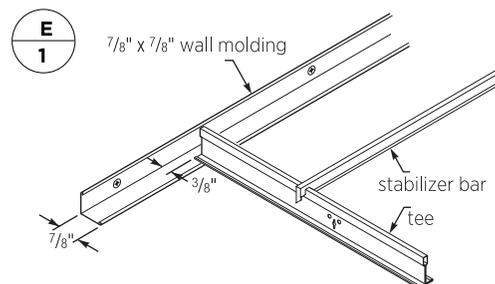


X -12gauge hanger wire
 - - - stabilizer bar

E
1

All main DONN® suspension systems - DX/DXL, Finline DXF, Finline 1/8 DXFF, Centricitee DXT/DXLT, CE, DXW, DXLA, and ZXLA - include the codecompliant intermediate-duty main tees for Seismic Design Categories A, B and C. The performance of DONN® seismic systems is based on the specific combination of superior components, and design and installation methods shown. Components from other manufacturers were not evaluated, and their use or any mixed use is not recommended. Convenience holes located in the tee bulb may be used for any and all hanger wires. Standard Seismic Application

Tee Unattached, Floating Wall







USGME TERMS & CONDITIONS

DELIVERY AND STORAGE OF MATERIALS

A. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Never Open the cartons and keep the boards in standing position. This will boost the possibility of warpage of the tile.

B. Storage:

1. Panels: Storage time of materials at the job site should be as short as possible, and environmental conditions should be as near as possible to those specified for occupancy (see no. Environmental Conditions below). Excess humidity during storage can cause expansion of material and possible warp, sag, or poor fit after installation. Chemical changes in the mat and/or coatings can be aggravated by excess humidity and cause discoloration during storage, even in unopened cartons. Cartons should be removed from pallets and stringers to prevent distortion of material. Long-term (6- 12 months) storage under uncontrolled environmental conditions should be avoided.

2. Suspension System: Store in manner that will prevent warping, scratches, or damage of any kind.

C. Handling: Handle in such manner to ensure against racking, distortion, or physical damage of any kind.

D. Damaged or deteriorated materials should be removed from the premises. Immediately before installation, to stabilize tile and panels, store them at a location where temperature and humidity conditions duplicate those ambient during installation and anticipated for occupancy. In this case, refer to USG Complaint Handling document and contact with the appropriate USG personnel should be made within three days of receiving the material (signed delivery documentation)

ENVIRONMENTAL CONDITIONS

A. Installation of acoustical panels shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete, or terrazzo work has dissipated.

B. Do not use ceiling panels in extreme or continuous high humidity, or areas exposed directly to weather or water. Ceiling panels are sized and designed for use within the standard occupancy range of temperature and humidity, 65-85 °F (18-29 °C), no more than 70% RH

(relative humidity). Humidity can greatly affect product dimensional stability and sag resistance. Sag can become noticeable during periods of high humidity lasting only a few hours. CLIMAPLUS ceilings if used with DONN® Brand Suspension Systems, can withstand temperatures from 60-104 °F (32-40 °C) and relative humidity up to 95%-100% RH. See USGME for specific Warranty information.

C. Allow time for dimensional changes in ceiling panels stored at temperature/humidity conditions well outside of those recommended for service. With increases in temperature/humidity, these products expand (up to 1/64 in./ft. (4.3 mm/m) at 85 °F (29 °C)/90% RH) and may not fit into a fixed grid. Conversely, with decreases, these products will be undersize, but expand to normal when standard ambient conditions return.

D. For some pattern edge details, if perimeter panels must be cut smaller, the cut edge must be field-rabbited, or the wall angle must be lowered by (1/4") (3/8") (Reveal Depth).

E. Formaldehyde & VOC Classification, as tested per ASTM D5116 and according to standards established by the Collaborative for High-Performance Schools (CHPS), the California Office of Environmental Health Hazard Assessment (OEHHA), and the USGBC LEED for Schools.

Products are classified as zero- or low-emitting for formaldehyde and VOC emissions as defined:

a. "Zero-Emitting"

Materials producing concentration levels below the test-chamber background level specified by the "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 addendum. Section 3.8.4.3 states, "Background concentrations in the empty chamber ventilated at 1.0 air changes per hour shall not exceed 2 µg m-3 (1.6 ppb) for any individual VOC, including formaldehyde" and all VOCs with chronic inhalation Reference Exposure Levels adopted by California EPA COEHHA for Proposition 65 chemicals.

USGME TERMS & CONDITIONS

b. "Low-Emitting"

1. Materials passing CHPS requirements as established in the "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 addendum. In addition, these products produce formaldehyde concentration levels below 9 µg m-3 & contribute no more than one-half of the chronic inhalation Reference Exposure Level adopted by California EPA COEHHA for all other VOCs identified by Proposition 65.
2. Must be tested by independent lab per these standards along with product submittals.
 - a. Documentation of laboratory test must indicate products and item number if test results differ for other facility manufacturing location for supplied products.

QUALITY ASSURANCE

- A. Single Source Responsibility:** To obtain combined warranty for the DONN® Brand suspension system and the acoustical panel, color match or ceiling panel and suspension system compatibility, all acoustical panel and suspension system components shall be produced and supplied by one manufacturer. Materials supplied by more than one manufacturer are not acceptable.
- B. Subcontractor qualifications:** Installer shall have successful experience in the installation of suspended ceiling systems on projects with requirements similar to requirements specified.
- C. Requirements of regulatory agencies:** Codes and regulations of authorities having jurisdiction.
- D. 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.

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 ceiling system and related ceiling components. Climatic Condition Range for panels used on this project are as follows:

1. ClimaPlus Ceilings: 60-90°F (16-29°C) with a max 95% RH.

CLIMAPLUS ceilings used with DONN® Brand Suspension Systems can be used when building is not enclosed and in higher temperature, relative-humidity range.

C. Coordination with other work:

1. General: Coordinate with other work supported by or penetrating through the ceiling, including mechanical and electrical work and partition systems.
2. Mechanical work: Ductwork above ceiling shall be completed and permanent heating and cooling systems operating to climate conditions prior to installation of ceiling components.
3. Electrical work: Installation of conduit above ceiling shall be complete before installation of ceiling components.
4. Fire protection work: Fire protection lines and/or equipment occurring above ceiling shall be completed and tested before ceiling components are installed.

D. Protection:

1. Personnel: Follow good safety and industrial hygiene practices during handling and installing of all products and systems, with personnel to take necessary precautions and wear appropriate personal protective equipment as needed. Read material safety data sheets and related literature for important information on products before installation. Contractor to be solely responsible for all personal safety issues during and subsequent to installation; architect, specifier, owner, and manufacturer will rely on contractor's performance in such regard.
2. Protect completed work above ceiling system from damage during installation of ceiling components.

INSPECTION

- A.** Examine areas to receive ceiling panels for conditions that will adversely affect installation. Provide written report of discrepancies.
- B.** Do not start work until unsatisfactory conditions are corrected.
- C.** Work to be concealed: Verify work above ceiling is completed and installed in manner that will not affect layout and installation of ceiling panels.
- D.** Beginning of installation shall signify acceptance of conditions in areas to receive ceiling panels.

ENVIRONMENTAL CONDITIONS

- A.** Installation of acoustical panels shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete, or terrazzo work has dissipated.
- B.** Do not use ceiling panels in extreme or continuous high humidity, or areas exposed directly to weather or water. Ceiling panels are sized and designed for use within the standard occupancy range of temperature and humidity, 65-85 °F (18-29 °C), no more than 70% RH

PREPARATION

Field dimensions must be verified prior to installation.

INSTALLATION

- A.** Standard reference: Install ceiling panels and suspension system, including necessary hangers, grillage, splines, and other supporting hardware, in accordance with ASTM C636, 2006 IBC (2007 CBC), CISCA Ceiling Systems Handbook, (UL Design) and any applicable code requirement.
- B.** Manufacturer's reference: Install ceiling panels in exposed grid systems, supported on all edges, in accordance with manufacturer's warranty.
- C.** Drawing reference: Install ceiling panels in accordance with approved shop drawings.
- D.** Hanger Wires:
 - 1. Spacing: Space hanger wires on main tees not more than 48 inches o.c. a maximum of 48" o.c., attaching hangers directly to the structure above, or as required to support loads.
 - 2. Limitations: Do not support wires from mechanical and/or electrical equipment, piping or other equipment occurring above ceiling.
- E.** Ceiling Perimeter: Install edge moldings (2" minimum) and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Tee ends shall be tied together with DONN® Brand Stabilizer Bars or other approved means to prevent the tees from spreading apart.
 - 2. Mechanically attach the terminal ends of the ceiling suspension members to the perimeter molding of two adjoining walls using pop-rivets or other approved means.
 - 3. Maintain a 3/4" clearance between the opposite ends of the suspension members and the wall. The unattached ends of the suspension members shall rest upon and be free to slide perpendicularly to the perimeter molding.
- F.** Alternate Perimeter Attachment: When approved by local code officials install 7/8" edge molding with ACM7 Seismic Clip - Install per USG literature AC3235.
- G.** Accessories: Install accessories as applicable to meet project requirements.
- H.** Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.
- I.** Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- J.** Install acoustical tiles in coordination with suspension system.
 - 1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
 - 2. Remove and replace any damaged tiles.
- K.** Lighting Fixtures:
 - 1. All light fixtures shall be mechanically attached to the suspension system per NEC 410-16 (two per fixture unless the fixture is independently supported).
 - 2. Support of rigid lay-in (Type G) or can light fixtures:
 - a. Each fixture less than 10 lbs. shall have a single wire (wire may be slack) attached from the fixture to structure.

USGME TERMS & CONDITIONS

- b. Each fixture that weighs between 10 and 56 lbs. shall have two wires (wires may be slack) attached at diagonal corners of the fixture to structure.
- c. Each fixture greater than 56 lbs. shall be directly supported to structure by approved hangers.
- d. Pendant light fixtures shall be directly supported from structure with 9-gauge wire (or approved alternative).

L. Air Terminals:

- 1. Air terminals less than 20 lbs. shall be positively attached to the suspension system
 - 2. Air terminals that weigh between 20 and 56 lbs. shall be mechanically attached to the suspension system. Two slack wires shall be attached from the housing to structure.
 - 3. Air terminals in excess of 56 lbs. shall be directly supported to structure by approved hangers.
- M. Sprinkler heads and other penetrations shall have 3/8" clearance on all sides.**

CLEANING

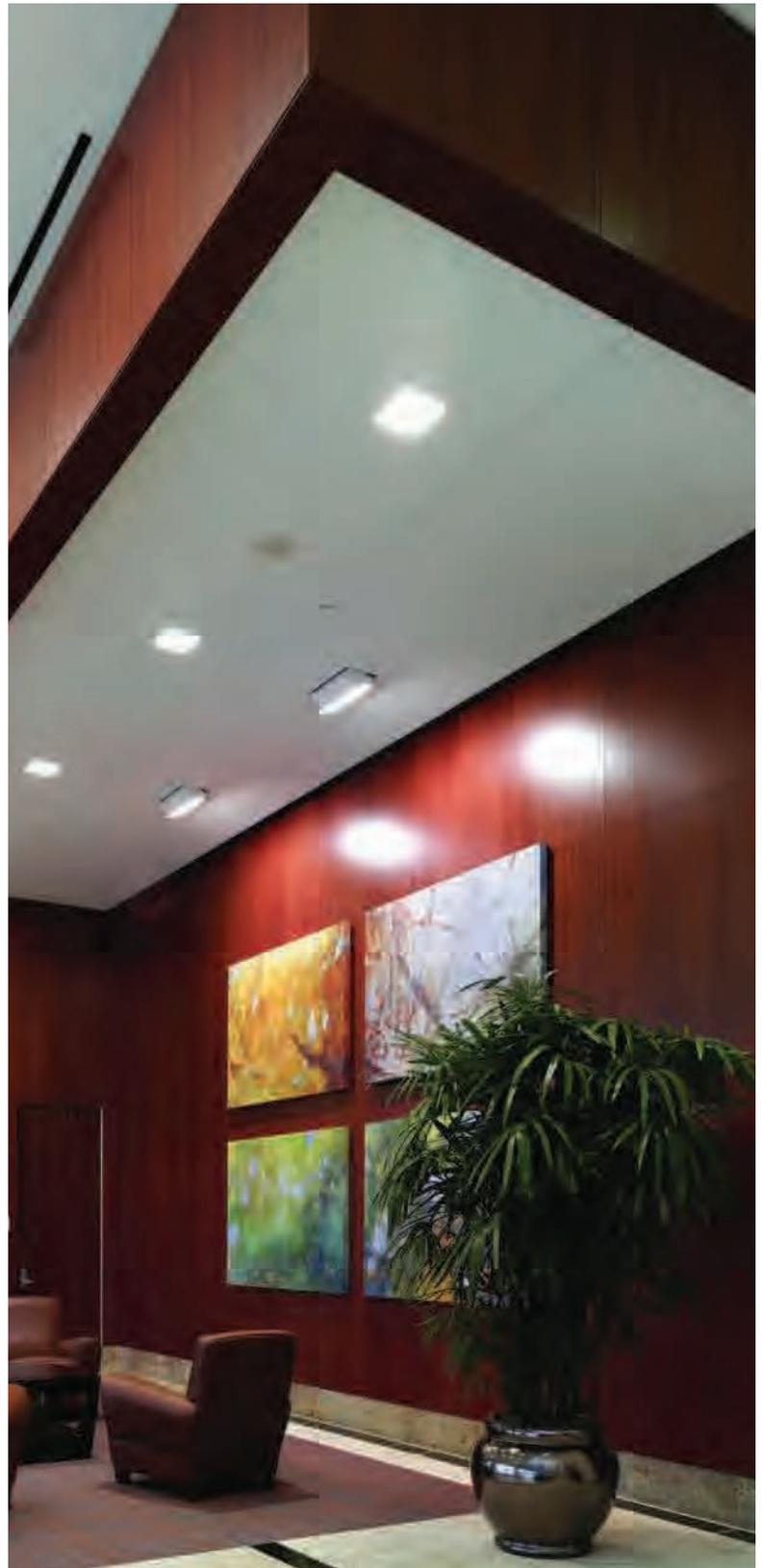
A. Suspension System: Remove panel material and perform any necessary cleaning maintenance with non-solvent based commercial cleaner.

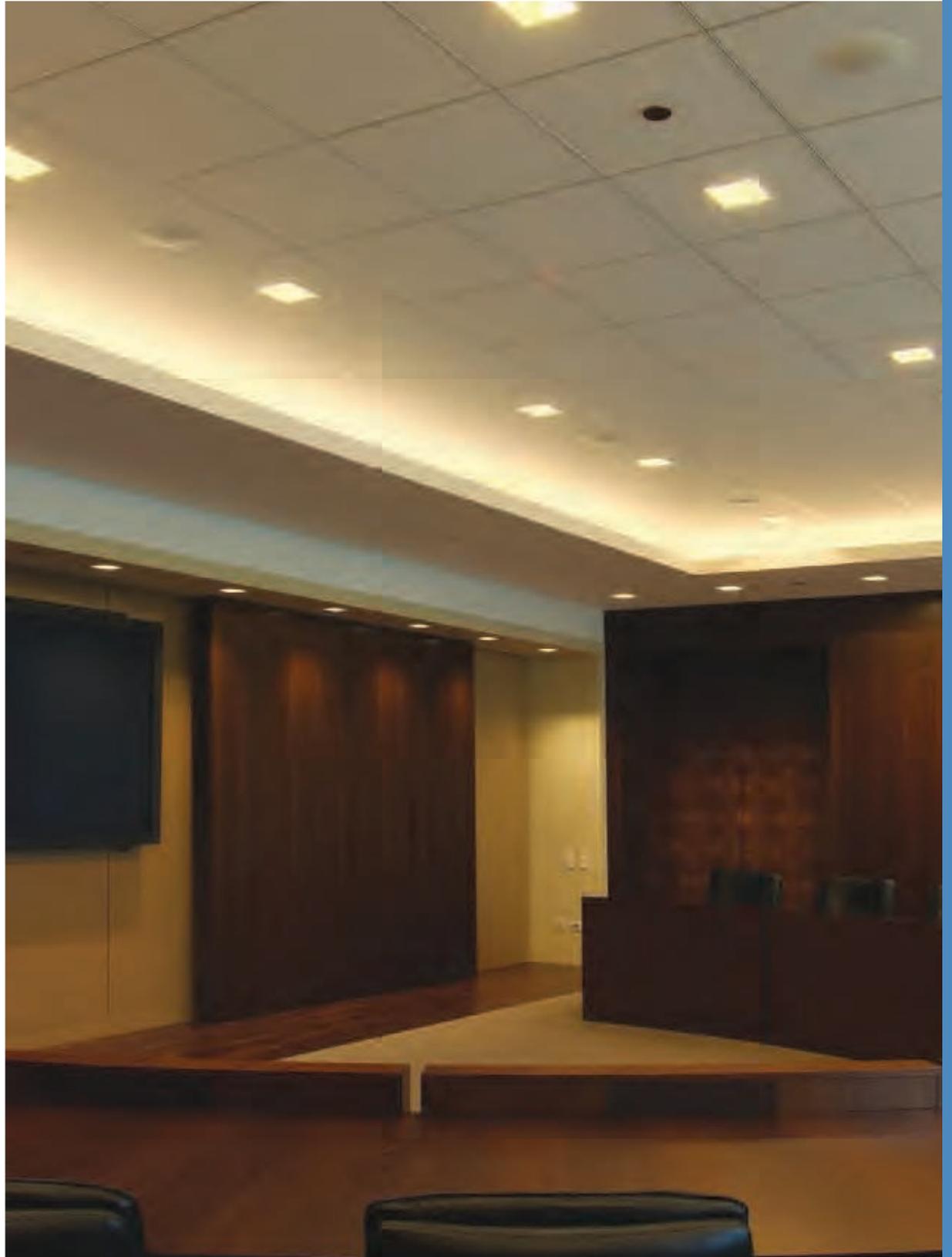
B Immediately remove any corrosive substances or chemicals that would attack painted finishes (i.e. wallpaper adhesives).

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

D. Painting: Repainting of suspension member shall be with a high-quality solvent base enamel paint and applied as recommended by paint manufacturer. Ceiling panels may be touched-up by spraying a thinned, non-bridging vinyl-acrylic flat wall paint. The type of paint selected and the method of application can alter the acoustical performance and fire ratings of any acoustical product. Therefore, USGME cannot guarantee that the field-painted panels will match the published performance.

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







ENVIRONMENTAL STATEMENT



ENVIRONMENTAL STATEMENT

Recycling is only a part of the story. Careful production methods are good for the environment and increase efficiency. Our practices include:

- **Using clean fuels (NG)**
- **Treating and recycling water** (Saving of 300 m³ daily at USGME)
- **Reducing waste** (Recycling): Waste from the production line and panels chipped or broken during processing are returned to the manufacturing cycle, keeping them out of landfills
- **Offering specialized ceiling panels:** High-durability acoustical panels extend the useful life of ceilings and reduce operating and replacement costs. Panels with high light reflectance can enhance indirect lighting, reducing the number of light fixtures needed and lowering energy consumption
- **Recycling old ceiling panels**
- **Product life cycle:** USG's commitment to health, safety and environmental responsibility is evident at every stage in the life cycle chain.

USGME has been granted to ISO 14000 certificate. This indicates that environmental aspects such as emissions into the air, waste handling, utilization of natural resources and energy efficiency are paid attention to at USGME and the environmental impacts of production are constantly improved. In addition to ISO 14000 certification, USGME is working to prove the environmental profile of USGME products by acquiring EPD (Environmental Product Declaration) to its Ceiling family range.

GREEN FACTS:

- More than 70% of manufacturing waste is recycled into ceiling products
- The majority of the Ceilings product offering contains 50% recycled content or higher
- USGME mineral fiber ceiling panels incorporate steel mill slag waste as well as post-consumer waste such as newspapers
- USGME has an Environmental certificate for its facility in Dammam for compliance with PME (Presidency of Metrology and Environment) according to Local regulations
- All USGME panels feature low VOC emission and comply with the Collaborative for High Performance Schools (CHPS) standards
- Many USGME ceiling products reflect light and work well in architectural designs that promote day lighting; reductions in lighting density made possible by such designs can result in energy savings and greenhouse gas reduction

PACKAGING FOR CEILING SYSTEM

THICKNESS	FAMILY TYPE/SIZE	NUMBER OF TILES PER CARTON PCS/CTN	M ² PER CARTON M ² /CTN	NUMBER OF BOXES / PER PALLET CTN/PALLET	M ² PER PALLET M ² /PALLET	BOX WEIGHT KG/CTN	PALLET WEIGHT KG/PALLET
12 mm	STD 600*600mm	16	5.76	52	299.52	21.6	1,123.26
	STD 610*610mm	16	5.95	52	309.5	22.3	1,160.64
15 mm	STD/C+ 600*600mm	12	4.32	56	241.92	15.3	856.80
	STD/C+ 610*610mm	12	4.46	56	249.98	15.8	884.57
	C+ 600*1200mm	8	5.76	40	230.40	20.4	816.00
	C+ 610*1220mm	8	5.95	40	238.08	21.1	842.92
	Olympia™ STD/C+ 600*600mm	12	4.32	56	241.92	16.7	932.40
	Olympia™ STD/C+ 610*610mm	12	4.46	56	249.98	17.2	962.62
	Olympia™ C+ 600*1200mm	8	5.76	40	230.40	22.2	888.00
	Olympia™ C+ 610*1220mm	8	5.95	40	238.08	22.9	917.29
	Fire Chief 600*600mm	12	4.32	48	207.36	21.7	1,041.60
	Fire Chief 600*610mm	12	4.46	48	214.27	22.4	1,075.36
	Olympia™ Fire Chief 600*600mm	12	4.32	48	207.36	22.8	1,094.40
	Olympia™ Fire Chief 600*610mm	12	4.46	48	214.27	23.5	1,129.87
	Fire Chief 600*1200mm	8	5.76	40	230.40	28.9	1,157.33
	Fire Chief 600*1220mm	8	5.95	40	238.08	29.9	1,195.51
	Olympia™ Fire Chief 600*1200mm	8	5.76	40	230.40	30.4	1,216.00
	Olympia™ Fire Chief 610*1220mm	8	5.95	40	238.08	31.4	1,256.53
	Plank 300*1200mm	16	5.76	40	230.40	20.9	836.00
	Plank 310*1220mm	16	5.95	40	238.08	21.6	863.58
	Plank Olympia™ 300*1200mm	16	5.76	40	230.40	22.2	888.00
	Plank Olympia™ 310*1220mm	16	5.95	40	238.08	22.9	917.29
19 mm	STD/C+ 600*600mm	10	3.60	52	187.20	16.0	832.00
	STD/C+ 610*610mm	10	3.72	52	193.44	16.5	859.73
	C+ 600*1200mm	6	4.32	40	172.80	19.2	768.00
	C+ 610*1220mm	6	4.46	40	178.56	19.8	793.60
	Olympia™ STD/C+ 600*600mm	10	3.60	52	187.20	17.6	912.60
	Olympia™ STD/C+ 610*610mm	10	3.72	52	193.44	18.1	943.02
	Olympia™ C+ 600*1200mm	6	4.32	40	172.80	20.9	834.00
	Olympia™ C+ 610*1220mm	6	4.46	40	178.56	21.5	861.80
	Fire Chief 600*600mm	10	3.60	40	144.00	24.7	986.00
	Fire Chief 600*610mm	10	3.72	40	148.80	25.5	1,018.87
	Olympia™ Fire Chief 600*600mm	10	3.60	40	144.00	25.7	1,026.00
	Olympia™ Fire Chief 600*610mm	10	3.72	40	148.80	26.5	1,060.20
	Fire Chief 600*1200mm	6	4.32	40	172.80	29.6	1,183.20
	Fire Chief 600*1220mm	6	4.46	40	178.56	30.6	1,222.64
	Olympia™ Fire Chief 600*1200mm	6	4.32	40	172.80	30.8	1,231.20
	Olympia™ Fire Chief 610*1220mm	6	4.46	40	178.56	31.8	1,272.24
	Halcyon™ 600*600mm	10	3.60	40	144.00	7.5	300.00
	Halcyon™ 600*610mm	10	3.72	40	148.80	7.8	310.00
	Halcyon™ 600*1200mm	6	4.32	40	172.80	9.0	360.00
	Halcyon™ 610*1220mm	6	4.46	40	178.56	9.3	372.00
	Plank 300*1200mm	12	4.32	40	172.80	19.2	768.00
	Plank 310*1220mm	12	4.46	40	178.56	19.8	793.60
	Plank Olympia™ 300*1200mm	12	4.32	40	172.80	21.1	842.40
	Plank Olympia™ 310*1220mm	12	4.46	40	178.56	21.8	870.48
	Plank Sonata/Oly 300*1500mm	12	5.40	30	162.00	26.6	796.50
	Plank Sonata/Oly 310*1520mm	12	5.56	30	166.90	27.4	820.57
	Plank Sonata/Oly 600*1500mm	6	5.40	30	162.00	26.6	796.50
	Plank Sonata/Oly 610*1520mm	6	5.56	30	166.90	27.4	820.57

THICKNESS	FAMILY TYPE/SIZE	NUMBER OF TILES		M ² PER CARTON M ² /CTN	NUMBER OF BOXES / PER PALLET CTN/PALLET	M ² PER PALLET M ² /PALLET	BOX WEIGHT KG/CTN	PALLET WEIGHT KG/PALLET
		PER CARTON	PCS/CTN					
22 mm	STD/C+ 600*600mm	8		2.88	40	115.20	18.5	741.89
	STD/C+ 610*610mm	8		2.98	40	119.04	19.2	766.62
	C+ 600*1200mm	6		4.32	40	172.80	27.8	1,112.83
	C+ 610*1220mm	6		4.46	40	178.56	28.7	1,149.93
	Olympia™ STD/C+ 600*600mm	8		2.88	40	115.20	19.5	781.89
	Olympia™ STD/C+ 610*610mm	8		2.98	40	119.04	20.2	807.95
	Olympia™ C+ 600*1200mm	6		4.32	40	172.80	29.3	1,172.83
	Olympia™ C+ 610*1220mm	6		4.46	40	178.56	30.3	1,211.93
25 mm	Halcyon™ 600*600mm	8		2.88	40	115.20	6.9	276.00
	Halcyon™ 610*610mm	8		2.98	40	119.04	7.1	285.20
	Halcyon™ 600*1200mm	4		2.88	40	115.2	10.4	414.00
	Halcyon™ 610*1220mm	4		2.98	40	119.04	10.7	427.80

	ITEM CODE	NUMBER OF PIECES PER CARTON PCS/Ctn
MAIN TEES	801DX3600H	25
	801DX3600IM	25
	801DX3660H30	25
	801DX3660IM	25
	801DXL3600	25
	801DXL3660	25
	801DXT15-3600M	20
	801DXT15-3660IM	20
WALL ANGLES	802M9-3600	40
	802MS3600	50
	802MT3600	40
LONG CROSS TEES (4 FT)	803DX1200H30	50
	803DX1200LM	75
	803DX1220H30	50
	803DX1220LM	75
	803DXT15-1200M	60
	803DXT15-1220IM	60
SHORT CROSS TEES (2 FT)	804DX600H30	50
	804DX600LM	75
	804DX610H30	50
	804DX610LM	75
	804DXT15-600M	60
	804DXT15-610IM	60



WARRANTIES AND LIMITATIONS

USGME Ltd (“USG Middle East”) following combinations of ceiling system products, as installed in the building nominated overleaf, carry a lifetime warranty from the date of installation (“Warranty Period”). Lifetime is defined as the useful life of the ceiling system up to a maximum of 30 years. USG acoustical panel only or USG DONN® grid only, carry a 15 year warranty from date of installation.

WHAT PRODUCTS ARE COVERED ?

This Warranty covers any of the following standard sizes 1200 x 600, 1200 x 300 and 600 x 600 mm combinations of:

USG CLEAN ROOM™ ClimaPlus	USG RADAR™ ClimaPlus	
USG SPARTA	USG RADAR™ Hi NRC ClimaPlus	
USG FROST™ ClimaPlus	USG RADAR Ceramic™	
USG HALCYON™ ClimaPlus	USG CROSS FISSURED ClimaPlus	
USG MARS™ ClimaPlus	USG PERFORATED ClimaPlus /	USG DONN® DX 24 mm Exposed Grid
USG SONATA ClimaPlus	USG PEDESTAL ClimaPlus /	USG DONN® Centricitee 15 mm Exposed Grid
USG OLYMPIA Micro™ ClimaPlus	USG SANDRIFT™ ClimaPlus /	USG DONN® Wall Angles
USG OLYMPIA II™ ClimaPlus	USG TAIGA HYGIENE ClimaPlus	

WHAT DOES THIS WARRANTY COVER ?

This Warranty covers the owner (and subsequent owners) of the building nominated overleaf in which the products are installed for the Warranty Period.

Product defects caused by faulty materials, manufacturing workmanship and failure to meet product specifications issued by USG Middle East in effect at the time of installation.

The nominated ceiling panels shall withstand normal climatic conditions including high temperature and humidity without visible sagging, warping or shrinking, or delamination of finished surfaces, provided that the panels are installed in normal occupancy conditions for which they are intended and within current environmental conditions of the product.

What Will USGME Do ?

USG Middle East at our election will replace or repair the defective product or, refund or credit an amount equal to the purchase price of the defective products and transportation net of all taxes, charges or other levies paid. This constitutes USG Middle East's entire liability.

WHAT DOES THIS WARRANTY NOT COVER?

This Warranty does not cover defects arising from a failure to comply with USGME's printed Guidelines, Limitations, Specifications, Installation Instructions and Standards, before, during and after installation. In particular the Warranty does not cover damage to the products arising from:

- Abnormal climatic conditions outside the products specification.
- Exterior applications.
- Chemical fumes*, corrosive substances, freezing temperatures or vibration.
- Ceiling panels used to support any other materials or fixtures such as lights, air conditioning grilles, insulation (which are above maximum backloading limitations), signs etc.
- Ceiling panels installed on furring strips, or if nails, staples or adhesives have been used in the installation process.
- Damage by fire, water (including condensation) or other elements of nature or act of God.
- Accidents, abuse, neglect deterioration by chemical action, damage during shipment, storage, installation or used for purposes other than for which they were designed.
- Other components in the ceiling systems not manufactured by USG Interiors such as hanger wires, fasteners, accessories.
- Alteration or removal of products without the prior approval of USG Interiors or attempts to repair any defective products.

*Radar Ceramic™ ClimaPlus will withstand corrosive chemical fumes

ALSO THIS WARRANTY DOES NOT COVER:

- Costs of removal or installation of products
- Cost of removal of damaged or installed faulty product
- Any direct, indirect or consequential damage or loss of any nature

IF YOU HAVE A PROBLEM?

USG Middle East will only accept claims in writing made in accordance with this warranty, and
■ within the Warranty Period, and
■ within 30 (thirty) days from the date the problem was, or by reasonable inspection should have been, discovered, and
■ with proof of installation (to assist, fill out details below)
You must keep any products that are alleged to be defective for our inspection and you must not attempt to alter, repair or remove these products.

OTHER LEGAL RIGHTS:

This Warranty is not part of a contract between USG Middle East and the building owner. USGME shall not be bound by any unauthorised warranty given by the seller of the products or the contractor. It does not exclude, limit, restrict or modify the rights and remedies available to the building owner, or the liability of the seller or contractor, under any statute or other laws in respect of the products and, in particular, when the goods are supplied to the final Consumer

PROJECT DETAILS:

NAME :

ADDRESS:

.....

COUNTRY:

OWNER :

LIFETIME / 15 YEAR CEILING SYSTEM WARRANTY

PRODUCT :

Panel : USG 00 x 00 x 1 mm m²

Grid : USG DONN® 00 x 00 mm m²

DATE OF INSTALLATION: 201

CEILING SYSTEMS CONTRACTOR:

NAME :

ADDRESS:

SIGNATURE:

TITLE :

DATE :

WARRANTY COPIES:

BUILDING OWNER

CEILING CONTRACTOR

USG MIDDLE EAST

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