

# Loadings - Maximum Allowable

To determine which is the most appropriate and cost effective grid combination compliant with AS/NZS 2785:2000 Suspended Ceilings - Design and Installation, use the following calculations.

## Step 1

### Maximum Load Calculations Ultimate Limit State

#### 1.1 Factored Dead Load

(A)

$$G = \text{Grid Weight} + \text{Panel Weight} + \text{Lights/Fixtures/Insulation etc Weight}$$

$$G = \frac{\quad}{\quad} + \frac{\quad}{\quad} + \frac{\quad}{\quad} = \quad \text{kg/m}^2$$

$$(A) = \frac{\quad}{\quad} \times 1.4 \quad \text{Therefore Maximum Load (A) = } \boxed{\quad} \text{ kg/m}^2$$

#### 1.2 Factored Dead Load

(A)

plus

(B)

From 1.1 above (A)  $\frac{\quad}{\quad} \text{ kg/m}^2$

+  $\frac{\quad}{\quad} \text{ kg/m}^2$

$U^* \times 1.7 = (B) \frac{\quad}{\quad} \text{ kg/m}^2$

Therefore Maximum Load (A) + (B) =  $\boxed{\quad} \text{ kg/m}^2$

If required under AS/NZS 2785:2000 Clause 3.2.2(b)

#### Notes:



\* Where  $U$  is 3.0 kg/m<sup>2</sup> minimum unless specified otherwise

- Load calculations 1.1 and 1.2 are based on AS/NZS 2785:2000 Clause 3.3.5(a). Load calculation 1.2 is based on a minimum Service Load of 3.0 kg/m<sup>2</sup> as required by the Standard. The contractor is to confirm that this load will not be exceeded, or alter the calculation accordingly. If Service Load  $U$  is NOT a requirement, use calculation 1.1 values only.
- These tables apply to areas of buildings that have **no openings to the outside**, such as doors, windows, ducts etc. In all other cases the appropriate design loading must be determined by the project structural engineer in accordance with AS/NZS 2785:2000 Clauses 3.3.5(b) or (c).
- Standard testing and installation for suspension is at 1200mm centres. Wider centres may be allowable - refer to respective grid combination tables. Hangers must be within 200mm maximum of Main Tee / Cross Tee connection.
- Heavy lighting or other mechanical services shall be supported on the main tees, included in the dead load 1.1 above, able to be supported by the selected grid combination, and/or should be independently supported if greater than 10kg (NZS4219).
- All point loads shall be fixed under suspension point on Main Tees only and hanger capacity should be checked against Step 3.
- Loadings are laboratory tested in accordance with AS/NZS 2785 with a deflection limit of L/360. Maximum allowable system loads take into account continuous spans and are applicable for ceilings 2.4 metres or longer. For ceilings shorter than 2.4 metres use a minimum of two hangers
- Seismic considerations for in-plane loads may take precedence in determining the required grid combination (refer to the USG Seismic Design Guide)
- Not all products may be available in all areas.
- For non-standard modules eg. 750 x 750mm etc. contact USG for availability and lead times prior to specification.

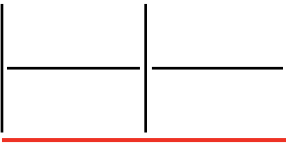
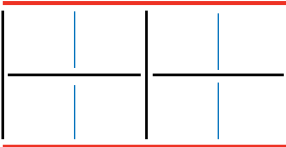


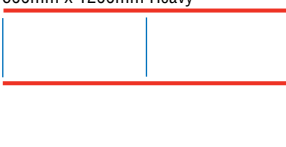
## Step 2

### Alternative Grid Layouts

From the grid diagrams below and opposite, select a ceiling layout and hanger spacing where the :  
**Maximum Load** (from Step 1, above) **is less than or equal to the Maximum Allowable Load** from the Tables.  
This will guide you as to the minimum grid combinations to use to fully comply.

	Grid Combinations			Hanger Spacing (mm)						System Weights kg/m <sup>2</sup>
	Main Tee	Cross Tee	Cross Tee	1000	1100	1200	1350	1500	1800	
<b>Standard 1200mm x 600mm</b> 	DX30D-3600	DX30S-1200		11.6	11.6	11.6	11.6	11.6	N/A	0.76
	DX30D-3600	DX30M-1200		23.5	23.5	19.7	15.5	11.6	N/A	0.79
	DX30D-3600	DX30D-1200		31.3	25.9	19.7	15.5	11.6	N/A	0.87
	DXL38D-3600 <small>Fire Rated Grid</small>	DX38D-1200		19.0	19.0	14.5	N/A	N/A	N/A	1.00
	DX38D-3600	DX30D-1200		31.8	31.8	30.1	21.3	15.4	N/A	0.92
	DX55D-3600* <small>*(to special order)</small>	DX30D-1200		31.8	31.8	31.8	28	20.4	11.8	1.05
<b>Standard 600mm x 600mm</b> 	DX30D-3600	DX30M-1200	DX30S-600	23.5	23.5	19.7	15.5	11.6	N/A	1.00
	DX30D-3600	DX30D-1200	DX30S-600	31.3	25.9	19.7	15.5	11.6	N/A	1.11
	DXL38D-3600 <small>Fire Rated Grid</small>	DX38D-1200	DX30D-600	19.0	19.0	14.5	N/A	N/A	N/A	1.29
	DX38D-3600	DX30D-1200	DX30D-600	31.8	31.8	30.1	21.3	15.4	N/A	1.21
	DX55D-3600* <small>*(to special order)</small>	DX30D-1200	DX30D-600	31.8	31.8	31.8	28	20.4	11.8	1.34

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Alternative Grid Layouts	Grid Combinations			Hanger Spacing (mm)						System Weights kg/m <sup>2</sup>	
	Main Tee	Cross Tee	Cross Tee	1000	1100	1200	1350	1500	1800		
	DX30D-3600	DX30M-1200		Maximum allowable load kg/m <sup>2</sup>	11.7	11.7	<b>11.7</b>	11.7	11.6	N/A	0.79
	DX30D-3600	DX30D-1200			15.9	15.9	<b>15.9</b>	15.5	11.6	N/A	0.87
	DX38D-3600	DX38D-1200			21.9	21.9	<b>21.9</b>	21.3	15.4	N/A	1.00
	DX55D-3600* (to special order)	DX38D-1200			21.9	21.9	<b>21.9</b>	21.9	20.4	11.8	1.13
	DX30D-3600	DX30M-1200	DX30S-600	Maximum allowable load kg/m <sup>2</sup>	11.7	11.7	<b>11.7</b>	11.7	11.6	N/A	1.00
	DX30D-3600	DX30D-1200	DX30S-600		15.9	15.9	<b>15.9</b>	15.5	11.6	N/A	1.10
	DX38D-3600	DX38D-1200	DX30D-600		21.9	21.9	<b>21.9</b>	21.3	15.4	N/A	1.30
	DX55D-3600* (to special order)	DX38D-1200	DX30D-600		21.9	21.9	<b>21.9</b>	21.9	20.4	11.8	1.42
	DX30D-3600	DX30M-1200		Maximum allowable load kg/m <sup>2</sup>	11.7	11.7	<b>11.7</b>	11.7	11.6	N/A	0.54
	DX30D-3600	DX30D-1200			15.9	15.9	<b>15.9</b>	15.5	11.6	N/A	0.58
	DX38D-3600	DX38D-1200			21.9	21.9	<b>21.9</b>	21.3	15.4	N/A	0.67
	DX55D-3600* (to special order)	DX38D-1200			21.9	21.9	<b>21.9</b>	21.9	20.4	11.8	0.80
	DX30D-3600		DX30D-600	Maximum allowable load kg/m <sup>2</sup>	51.7	51.7	<b>39.5</b>	31.0	23.3	13.5	1.17
	DXL38D-3600 Fire Rated Grid		DX30D-600		29.1	29.1	<b>29.1</b>	N/A	N/A	N/A	1.25
	DX38D-3600		DX30D-600		60.2	60.2	<b>60.2</b>	42.9	30.8	17.8	1.25
	DX55D-3600* (to special order)		DX30D-600		77.8	77.8	<b>77.8</b>	56.2	40.7	23.6	1.52
	DX30D-3600		DX30D-600	Maximum allowable load kg/m <sup>2</sup>	51.7	51.7	<b>39.5</b>	31.0	23.3	13.5	0.87
	DXL38D-3600 Fire Rated Grid		DX30D-600		29.1	29.1	<b>29.1</b>	N/A	N/A	N/A	0.96
	DX38D-3600		DX30D-600		60.2	60.2	<b>60.2</b>	42.9	30.8	17.8	0.96
	DX55D-3600* (to special order)		DX30D-600		63.6	63.6	<b>63.6</b>	56.2	40.7	23.6	1.23

## STEP 3 Maximum Allowable Loads (kg/m<sup>2</sup>) with Main Tees at 1200mm spacing.

(if at 600mm spacing double the Allowable Load)

Use a hanger type and location greater than the Maximum Allowable Loads from the tables above.  
Use of these tables must take into account any point loads.

Hanger spacing	Using a bulb hole			Using a web hole			Using a CL315 Clip			Using a DFS200 Strap		
	1200	1350	1500	1200	1350	1500	1200	1350	1500	1200	1350	1500
DX30D-3600	N/A	N/A	N/A	33.3	29.6	26.6	40.8	36.3	32.6	N/A	N/A	N/A
DX38D-3600	31.5	28.0	25.2	48.7	43.3	38.9	49.0	43.6	39.2	37.6	33.4	30.1
DXL38D-3600 (Ø 2.5 wire only)	N/A	N/A	N/A	48.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DX55D-3600	46.2	41.1	37.0	45.1	40.1	36.1	62.5	55.6	50.0	78.0	69.3	62.4