Building Regulation B2: Thermoplastic Diffusers TP(a) and TP(b)

Thermoplastic Diffusers are widely used in the lighting industry, their use is governed by Building Regulation B2.

Thermoplastic Diffusers are generally classified according to their flammability as TP(a) or TP(b) where TP is an abbreviation of Thermoplastic. TP(a) and TP(b) Diffusers are rigorously tested in Laboratory Test Houses to BS 2782-0 (*Methods of Testing Plastics*) to determine the rate of burning. Typically, Diffusers are manufactured from materials such as Polycarbonate (PC), Polystyrene (PS) or Acrylic (PMMA) but not all will comply with the rate of burning requirements. TP(a) Diffusers are manufactured from material which extinguishes within 5 seconds following the removal of the burner or are automatically deemed to comply if they are manufactured from Polycarbonate at least 3mm thick. TP(b) Diffusers have a rate of burning which does not exceed 50mm/minute.

A luminaire is only judged to be part of a ceiling when it is recessed into that ceiling, surface or suspended luminaires are by definition not part of a ceiling and are therefore not required to have TP rated Diffusers, see Diagram 6.1 below from Building Regulation B.

TP(a) Diffusers have no restrictions on the extent of their use other than they cannot be used in Protected Stairways (a stair that leads to a final exit), where the use of any Thermoplastic material as part of the ceiling is not allowed. TP(b) Diffusers can be used in Rooms and Circulation Spaces but are limited on the extent of their use. For example, the Diffuser must have a maximum area of 1m2, the maximum total area of all Diffusers must not exceed 50% of the floor area for Rooms or 15% of the floor area for Circulation Spaces and the Diffusers must be spaced apart by at least their largest dimension. TP(b) Diffusers cannot be used in Protected Stairways. See Table 6.2, Diagrams 6.2 and 6.3 for the limitations for the complete limitations.

Please see the following 'Lighting Diffusers' section of Building Regulation B2 for full clarification of the Regulation, or the complete document can be downloaded here

Thermoplastic materials

Lighting diffusers

6.16 The following paragraphs apply to lighting diffusers forming part of a ceiling. Diffusers may be part of a luminaire or used below sources of light. The following paragraphs *do not* apply to diffusers of light fittings attached to the soffit of a ceiling or suspended beneath a ceiling (Diagram 6.1).

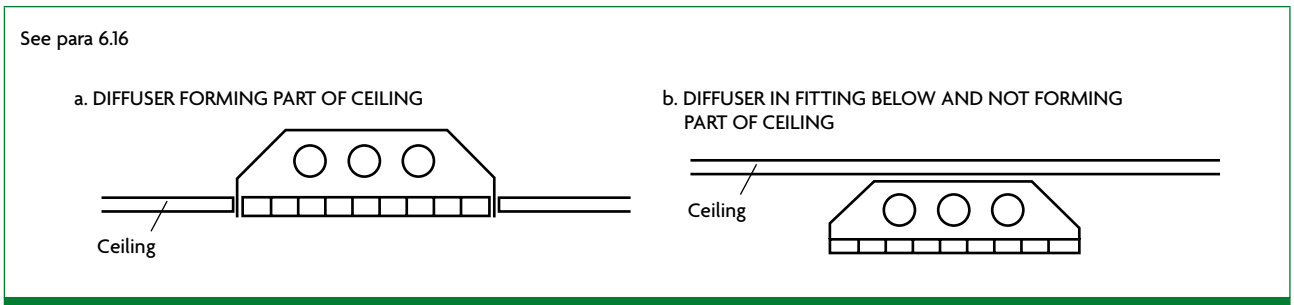


Diagram 6.1 Lighting diffuser in relation to ceiling

6.17 Diffusers constructed of thermoplastic material may be incorporated in ceilings to rooms and circulation spaces, but not to protected stairways, if both of the following conditions are met.

a. Except for the upper surfaces of the thermoplastic panels, wall and ceiling surfaces exposed in the space above the suspended ceiling should comply with paragraph 6.1.

b. Diffusers should be classified as one of the following.

i. TP(a) rigid – no restrictions on their extent.

ii. TP(b) – limited in their extent (see Table 6.2 and Diagram 6.2).

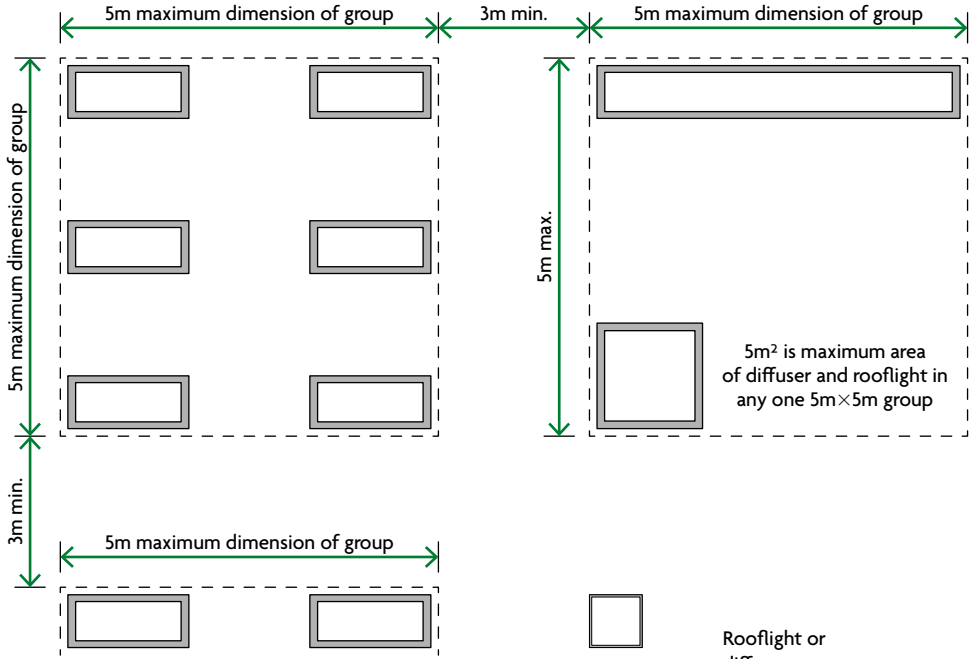
Suspended or stretched-skin ceilings

6.18 A ceiling constructed from TP(a) flexible panels should meet the following conditions.

a. Have a maximum area of 5m^2.

b. Be supported on all sides.

See para 6.17



NOTES:

1. Upper and lower surfaces of suspended ceiling, between plastic panels, to comply with paragraph 6.1.
2. No restriction on class D-s3, d2 diffusers or rooflights in small rooms.
3. See note 4 to Table 6.2.

Diagram 6.2 Layout restrictions on class D-s3, d2 plastic rooflights, TP(b) rooflights and TP(b) lighting diffusers

Table 6.2 Limitations applied to thermoplastic rooflights and lighting diffusers in suspended ceilings and class D-s3, d2 plastic rooflights[1]

Minimum classification of lower surface	Use of space below the diffusers or rooflight	Maximum area of each diffuser or rooflight[2] (m^2)	Maximum total area of diffusers and rooflights as a percentage of floor area of the space in which the ceiling is located (%)	Minimum separation distance between diffusers or rooflights[2] (m)
TP(a)	Any except protected stairway	No limit[3]	No limit	No limit
D-s3, d2[4] or TP(b)	Rooms	1	50[5][6]	A distance equal to the largest plan dimension of the largest diffuser or rooflight (see Diagram 6.3)
		5	50[5][6]	3[6]
	Circulation spaces except protected stairways	5	15[5]	3

NOTES:

1. This table does not apply to products that meet the provisions in Table 6.1.
2. Smaller rooflights and diffusers can be grouped together provided that both of the following satisfy the dimensions in Diagram 6.2 or 6.3.
   a. The overall size of the group.
   b. The space between one group and any others.
3. Lighting diffusers of TP(a) flexible rating should be used only in panels of a maximum of $5m^2$ each. See paragraph 6.18.
4. There are no limits on the use of class D-s3, d2 materials in small rooms. See Table 6.1.
5. The minimum 3m separation given in Diagram 6.2 between each $5m^2$ group must be maintained. Therefore, in some cases, it may not be possible to use the maximum percentage quoted.
6. Class D-s3, d2 rooflights to rooms in industrial and other non-residential purpose group buildings (purpose groups 3 to 7) may be spaced 1800mm apart provided both of the following conditions are met.
   a. The rooflights are evenly distributed.
   b. The total area of the rooflights does not exceed 20% of the area of the room.

See Table 6.2

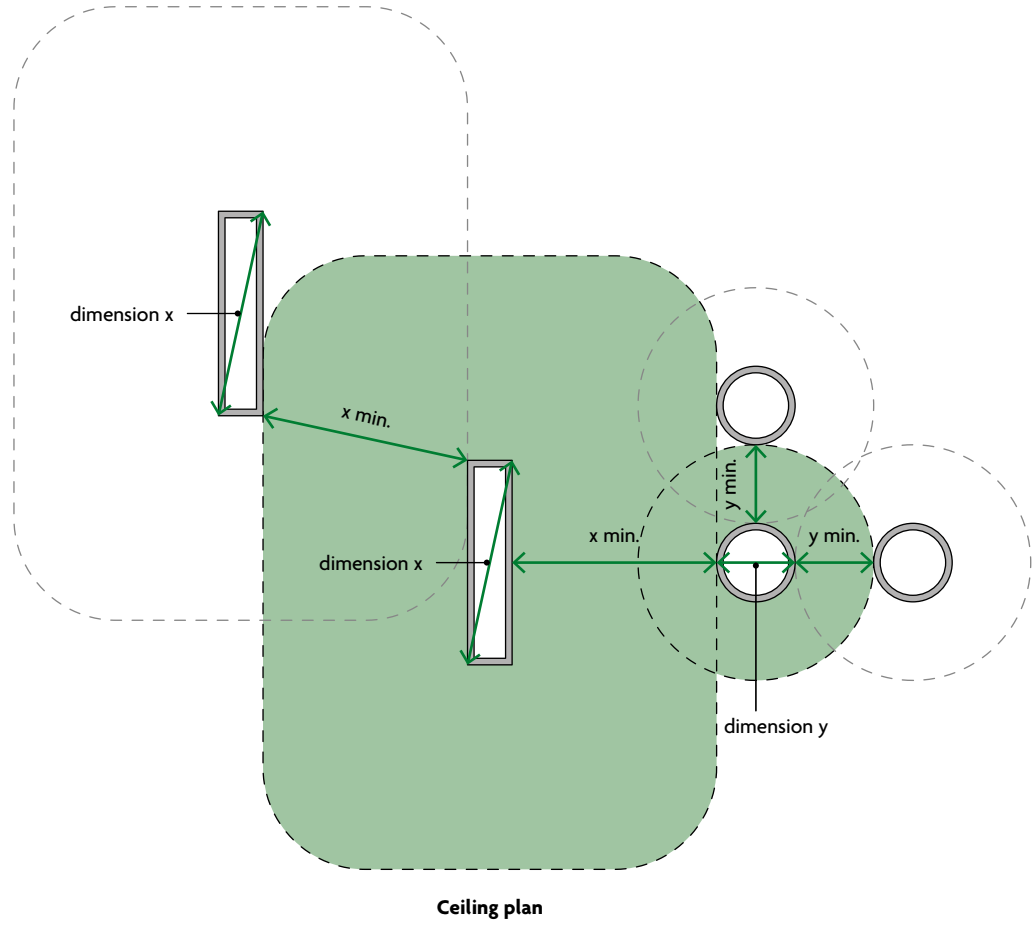


Diagram 6.3 Layout restrictions on small class D-s3, d2 plastic rooflights, TP(b) rooflights and TP(b) lighting diffusers