



Thermoplastic Lighting Diffusers

Revision 1, 2018

Thermoplastic lighting diffusers

Following recent events, there has been increasing queries raised in relation to the use of thermoplastic materials and compliance with the various UK Building Regulations.

This document has been put together to summarise and help explain the requirements around the use of thermoplastic materials in light fittings in non-domestic buildings.

Guidelines:

This document should be read in conjunction with the following building regulation documents:

England: *The Building Regulations 2010 Approved Document B: Fire Safety: 2006 edition incorporating 2007, 2010, and 2013 amendments*

Scotland: *The Building (Scotland) Regulations, Technical Handbook – Non-Domestic (section 2). 2016*

Wales: *Approved Document Volume 2 – Buildings other than dwellinghouses: Fire Safety Part B. 2006 edition incorporating 2010, 2013, 2016 & 2017 amendments.*

Northern Ireland: *The Building Regulations (Northern Ireland) 2012 Guidance, Technical Booklet*

Please note there are variations between documents that must be considered. Further clarification available on request

Lighting design and layout requirements

The guidelines above allow for the use of TP(a) and TP(b) materials as long as the guidelines outlined below are followed. Further technical detail and information can be found within the specific documents outlined above.

Type of luminaire

The building regulation guidelines around the use of thermoplastic materials only refer to recessed luminaires where the diffuser forms part of the ceiling (figure 1). They are not concerned with the use of surface and suspended luminaires:

Figure 1

a) Diffuser forming part of ceiling



a) Diffuser in fitting below and not forming part of ceiling



Types of thermoplastic materials

There are 2 types of thermoplastic materials used by Whitecroft Lighting in our recessed luminaires:

TP(a) – Defined as a self-extinguishing material. Typically we achieve this by using $\geq 3\text{mm}$ thick polycarbonate material

TP(b) – Rigid solid sheet $< 3\text{mm}$ thick or 1.5mm to 3mm thick that has been tested to have a slow burn rate that does not exceed 50mm/minute

Note: Whitecroft Lighting do not use TP(a) flexible materials

Recessed luminaire summary (by type)

Below is a list of all Whitecroft Lighting recessed modular fittings and the standard thermoplastic material used:

Luminaire Family	TP(a)	TP(b)
Avenue Hex & Opal Lay in	✓	
Avenue Clip-in Diffuser		✓
Avenue Micro		✓
Capital		✓
Cascade LED (Hex)	✓	✓
Cascade LED (Opal)	✓	
Cascade Edge		✓
Cityline		✓
DTFA	✓	
DTFN	✓	
DTFU	✓	
Duo2		✓
Duo3		✓
Helm	✓	
Hygiene	✓	
Hygiene LED	✓	
Lister	✓	
Lister 2	✓	
Spear Diffuser	✓	
Tegan		✓
Tegan Line		✓
Tegan Slim (Quad)		✓
Tegan Slim (Opal)	✓	✓

All luminaires are available with TP(a) on request and subject to quantity

Fire Protected Zones and Stairways

Recessed luminaires with thermoplastic materials cannot be used unless tested as part of the ceiling system. Surface or suspended products should typically be used for these applications.

TP(a) Rigid

Except as outlined above, there are no restrictions on the use of TP(a) materials.

TP(b)

Fire Protected Zones and Stairways

As highlighted above, recessed TP(b) luminaires cannot be used in these applications.

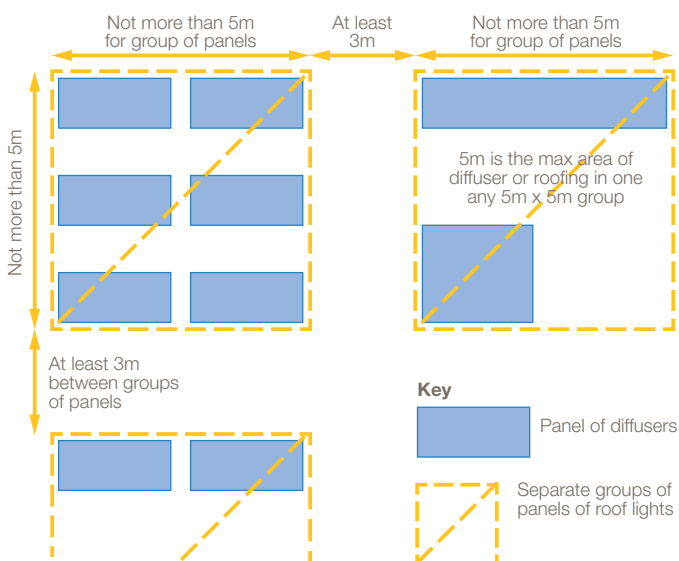
Circulation (excl stairways and protected zones)

Total surface area cannot exceed 15%.

Fittings cannot be mounted closer than 3.0m edge to edge. For a 600x600 modular ceiling grid this equates to 3.6m centre to centre.

Continuously mounted and small groups of fittings that do not exceed 5m in length or 25m² in area can be used as long as these are separated by a gap of at least 3m edge to edge (see figure 2).

Figure 2

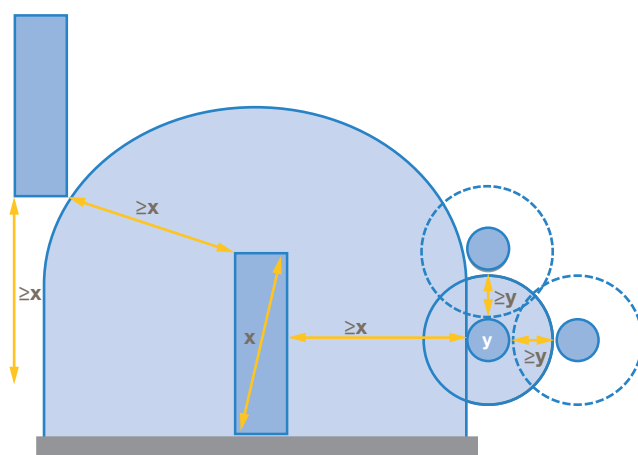


Open Area

There are different limitations outlined within the various national guidelines highlighted below. Please refer to the national documents or contact Whitecroft for further details:

- The maximum amount of TP(b) material cannot exceed 50% of the floor space.
- For luminaires up to 1m² (all standard Whitecroft Lighting modular fittings) the distance between luminaires must be 'equal to the largest plan dimension of the largest diffuser or roof light' (figure 3). The standards refer to the lighting diffuser area and not the luminaire area. As indicated in figure 3, for a linear/square fitting this is the distance to the opposite corners, and means fittings cannot be spaced closer 'edge to edge' than this distance.**

Figure 3



- X = maximum dimensions of the largest diffuser or rooflight
- Y = Maximum dimensions of the smallest diffuser or rooflight
- Dimension relates to diffuser size, not luminaire body size
- If fittings have to be mounted closer than the above image, spacings as detailed in figure 2 will have to be used or TP(A) will be required

**Not applicable for Northern Ireland or Republic of Ireland (see point D for requirements)

- For continuously mounted fittings using a TP(b) lighting diffuser the maximum run should not exceed 5m before a 3m separation (edge to edge) is applied (see figure 2).
- Luminaires using TP(b) optics can be mounted closer together than indicated in figure 3 as long as the group of fixtures is no greater than 5m x 5m in area. This would be common in a small cellular office with typically 4 luminaires. Once this limit is reached, a separation of 3m (edge to edge) should be provided (see figure 2).
- In the unlikely event of a fitting having a diffuser surface area >1m² a separation of >3.0m should be applied (edge to edge) or TP(a) diffuser will be required.

For sample layouts and design restrictions please see over the page

Further reading

SLL Factfile 12 - Thermoplastic diffusers & Fire safety 2017

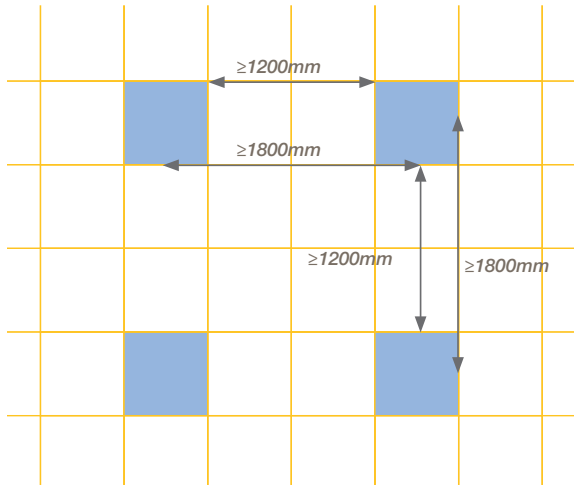
For more information on the use of Thermoplastic lighting diffusers and compliance with UK Building Regulations please contact your local Whitecroft Lighting Sales Engineer or the Whitecroft Lighting Technical Department.

Example scenarios when using recessed luminaires with TP(b) thermoplastic lighting diffusers

Modular Fittings

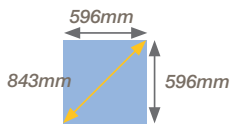
Open Plan Spaces (England, Scotland and Wales)

600mmx600mm (Example Tegan Slim)

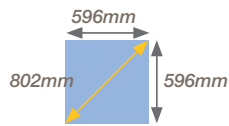


Luminaire size = 596 x 596

Diffuser surface area = 567 x 567

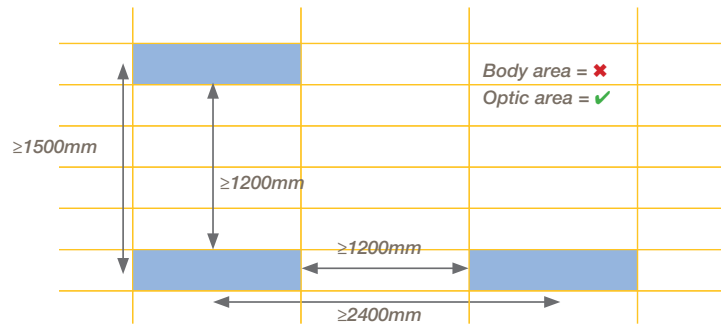


Edge to edge distance must be $\geq 843\text{mm}$



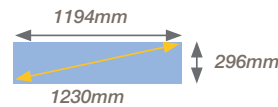
Edge to edge distance must be $\geq 802\text{mm}$

1200mmx600mm (Example Cityline)

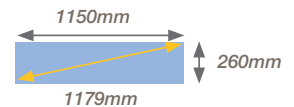


Luminaire size = 1194 x 296

Diffuser surface area = 1150 x 260



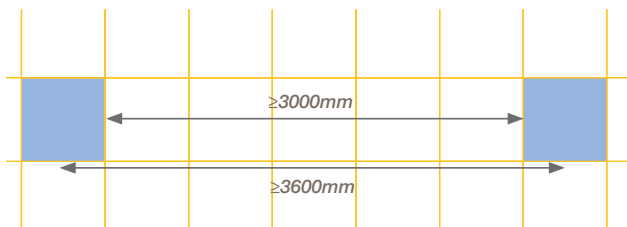
Edge to edge distance must be $\geq 1230\text{mm}$



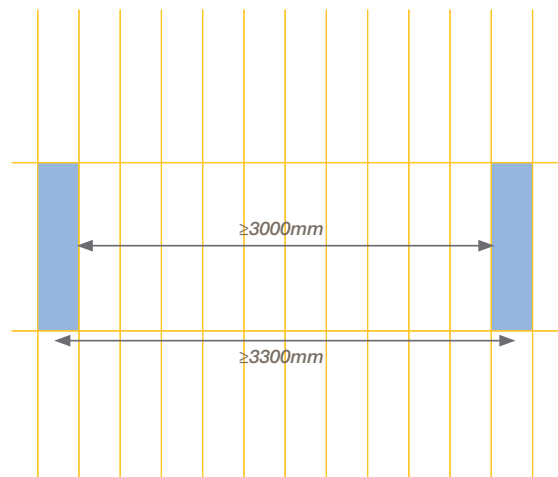
Edge to edge distance must be $\geq 1179\text{mm}$

Circulation (All regions)

600mmx600mm



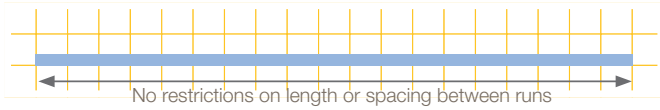
1200mmx300mm



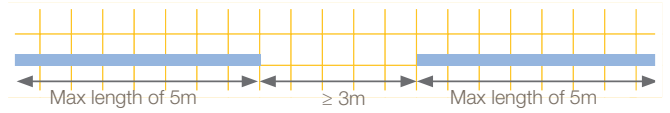
Continuously Mounted Fittings

Circulation Spaces (All regions)

TP(a) lighting diffuser (e.g. Avenue)



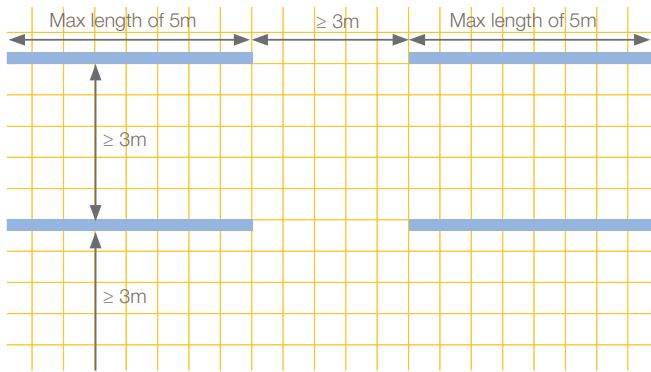
TP(b) lighting diffuser (e.g. Avenue Micro)



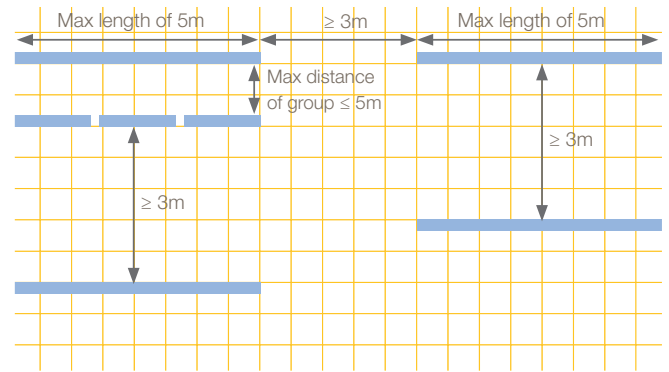
Open Plan Spaces

TP(b) lighting diffuser (e.g. Avenue Micro)

Regular Array



Irregular Array



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