



## TECHNICAL INFORMATION FOR TRO- SPAN CEILING PANELS

Tro-Span ceilings have been designed with a combination of loads all in accordance with BS6399 Pt 1 panel dead weight. Furthermore, both wall and ceiling spans have been independently tested in accordance with European Standards EN14509.

Ceilings typically fit into the following two categories:

### 1. Non Walk-On

These are dimensioned only for the panel dead weight and loads from suspensions in the panels. No traffic is allowed on these panels after installation or use as the ceilings as support for ducts or refrigeration plant

### 2. Walk-On

These can be dimensioned in accordance with European recommendations for sandwich panels for panel dead weight; point load @ 0.9kN (90Kg/1 person and a toolbox) and uniformly distributed service load (UDL) @ 0.25kN/m<sup>2</sup>, and deflection limit @ L/200.

Tro-Span panels are not intended to be used as permanent work surfaces, nor are they intended to be used as a support for machines and plant. Such devices are to be suspended from a separate load bearing structure. If the walk on ceiling has to be protected, the weight of the protection has to be taken into account in dimensioning.

### Protection of Walk-on Ceilings:

Tro-Span panels are not designed for heavy or continuous foot traffic. Where this occurs panels should be protected using load bearing distributing boards. Loads from permanent walk ways on Tro-Span ceilings should be transferred to load bearing frames.

Walk-ways should typically be constructed of a minimum of 10mm plywood, 1 metre wide secured with self tapping screws, to the external face of the insulating sandwich panel.

Where possible the walk-ways should be constructed at right angles to the structural span of the insulating sandwich panels and as near to the ceiling support structure as possible including the external periphery of the ceiling.

## Construction of Walk-On Ceiling Panels:

Unless otherwise requested, this ceiling will be a non-specific white finish in food safe laminate as standard; other finishes are available. Panel widths are nominally 1200mm with a single line joint. The span data is based upon 0.5kN/m<sup>2</sup> UDL which gives the ability for a person and toolbox for occasional maintenance, and not for use as a working platform or support for structures. Generally, these ceilings are designed so that sprinklers, lights, and suspended ceilings can be supported. Tro Span “Walk-On” Ceiling panels are typically comprised of two steel exterior skins in-filled with polystyrene *unless otherwise specified*. Alternative in-fill materials to polystyrene are available and include PIR and Mineral Wool; mineral wool is typically used when fire-rating is required however certain types of PIR can be used in fire rated applications.

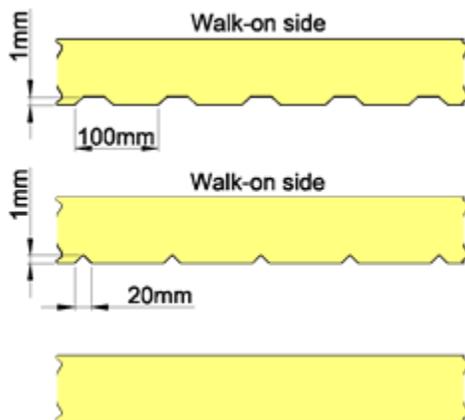
## Panels

The composite panel is produced on a continuous lamination machine, and consists of a ‘core’ of thermally efficient insulant which is bonded between pre-stressed galvanized steel faces. The complete ‘sandwich composite’ process gives the panel its structurally impressive free spanning characteristics and makes it suitable for both internal and external applications.

Tro Span panels are a versatile composite insulated panel system particularly suited for temperature-controlled applications, e.g. chill and cold stores as well as distribution centres, firewall applications, data centres, clean rooms, and the pharmaceutical industry.

## Panel Dimensions

Width: Standard panel width 1190mm  
 Thickness: Ranges from 40mm up to 300mm, depending upon span and application  
 Length: Panels can be manufactured to any length; the only restrictions being transport and handling constraints.



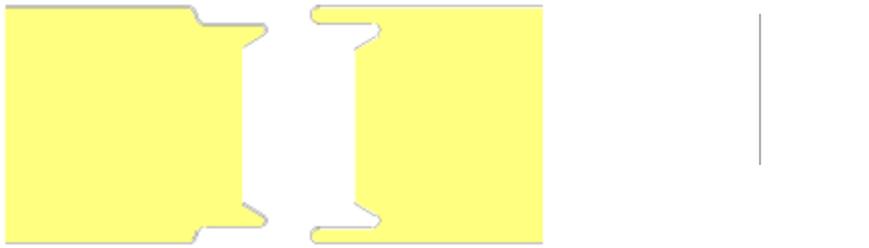
Castellation: Pitch 100mm

V Rib: Pitch 200mm – 5 per panel

Flat: Laminated panel produces a much flatter surface than other manufacturing methods, but ‘optical’ flatness is not assured; some shadowing might be evident in certain lighting situations.

## Panel Joints

The steel edge itself is roll formed to create the male / female interlocking joint which gives the assembled system its superb strength characteristics. The Joint allows application of site applied mastic or silicone to the female edge, creating an effective vapour or food safe hygienic seal which does not protrude beyond the face of the panel.



**Polystyrene** in-filled non fire-rated panels are lightweight but also with excellent rigidity. The infill contains a flame retardant additive (FRA) which restricts the extent of burn when tested to BS4735:1974 and will self-extinguish if the source of the fire is removed. The maximum span is 12400 if 250mm thick, 10470 if 200mm thick, or up to 6040 if 100mm thick.

**PIR (Polyisocyanurate)** infilled panels have a polyisocyanurate core, manufactured from MDI polyols and blowing agent (ODP zero + GWP less than 5) to produce highly cross linked polymers. This closed cell foam has an excellent performance, good shear and tensile strength and is very lightweight.

For non fire-rated applications PIR has a maximum span of 9600 if 225 thick, or up to 6000 if 100mm thick. A fire rating of 60 minutes is possible up to 3400 span if 150 thick. Greater spans can be achieved but there would need to be support either from below with internal supports and beams, or from above using suspension cables to a suitable building structure.

Where fire rating is necessary, all panel joints must be ‘stitched’ with pop rivets at 300mm centers on both faces.



**Mineral wool** infilled panels can be fire rated dependant upon the thickness and span. For non fire-rated applications the maximum span is 8200 if 200mm thick, or up to 6000 if 100mm thick.

A 60 minute fire rating is possible up to 5000 span if 100mm thick. Greater spans can be achieved but there would need to be support either from below with internal supports and beams, or from above using suspension cables to a suitable building structure.

**PLEASE NOTE:** Although both the Elan partitions (when specified to be fire rated) and the Tro Span Ceiling have their own individual fire ratings we do not have a fire rating certificate for a complete job.

### Technical Specifications – Load Spans

PIR Ceiling panels have a 0.7mm thick top face. Ceiling panels complying with BS6399 for “Walk On Ceiling” have been designed to sustain a uniform distribution load of 0.25 KN/m, together with a Centre Point load of 0.9KN.

Values have been calculated using the limit state method described in the ‘european recommendation sfor the design of Sandwich panels’ (ECCS Document No.66:1991). Safety factors used 1.5 Live Load, 1.35 Dead Load. The deflection limit is controlled by L/240.



## Working Procedure

When installed Mineral Fibre and PIR Ceiling panels offer a limited walk-on facility, however ***this is suitable for intermittent personnel use only, and panels should not be used as a working platform.*** Overloading should be avoided at all times and personnel should not gather in groups greater than two on any single panel, particularly adjacent to apertures which must be suitably framed and supported. Jumping and bouncing should also be avoided.

In areas subject to frequent use and access, Youngman type boards and catwalks should be used as walkways. Ancilliary equipment i.e. pipes, refrigeration equipment, ductwork, etc. should not be supported by the panels – the support should be taken from the building structure. Installation of equipment is not allowed on unprotected panels.