

SPECIFICATION FOR SIDE PROTECTION PANEL

1. SCOPE

This document provides the specification and attachment method for side protection panels. The panel must be constructed using the material described in section 2.

2. PANEL MATERIAL

Material description

1. The panel shall be constructed using carbon fibre outer plies and Diolen (polyester) fibre core, bonded with an epoxy resin system by vacuum infusion.

Carbon

Minimum average weight 400 gsm, woven carbon, T700 minimum
e.g. PRF Composites C0427, 420 gsm plain weave HTS40 Toho Tenax 12K

Diolen

Minimum average weight 520 gsm, woven polyester
e.g. PRF Composites Diolen P025K 520 gsm

Matrix System

Epoxy resin system appropriate for vacuum infusion 30-35% by weight.
e.g. PRF Composites RS-M135 resin and RS-MH137 hardener with mix ratio 100-30.

3. CONSTRUCTION

The construction of the panel shall avoid darts, joins or gaps in any ply, apart from those required to cover complex geometry and cut-outs for wiring. Rebates shall not be permitted. Any joins required in each ply, to cater for a finite material roll width, shall overlap by at least 10 mm and be staggered through the laminate, to avoid superimposing. The panel must be cured to the manufacturer's recommended cure cycle. The panel will be mechanically fastened to the chassis as described in section 4.

3.1 Stacking sequence

(0 degree represents longitudinal axis of the chassis)

Outer surface

2 plies Carbon (0/90)2

13 plies Diolen (0/90)13

2 plies Carbon (90/0)2

Inner surface

3.2 Thickness

The minimum thickness of the cured panel shall be 10 mm.

3.3 Area weight

The minimum area weight of the cured panel shall be 12,000 gsm.

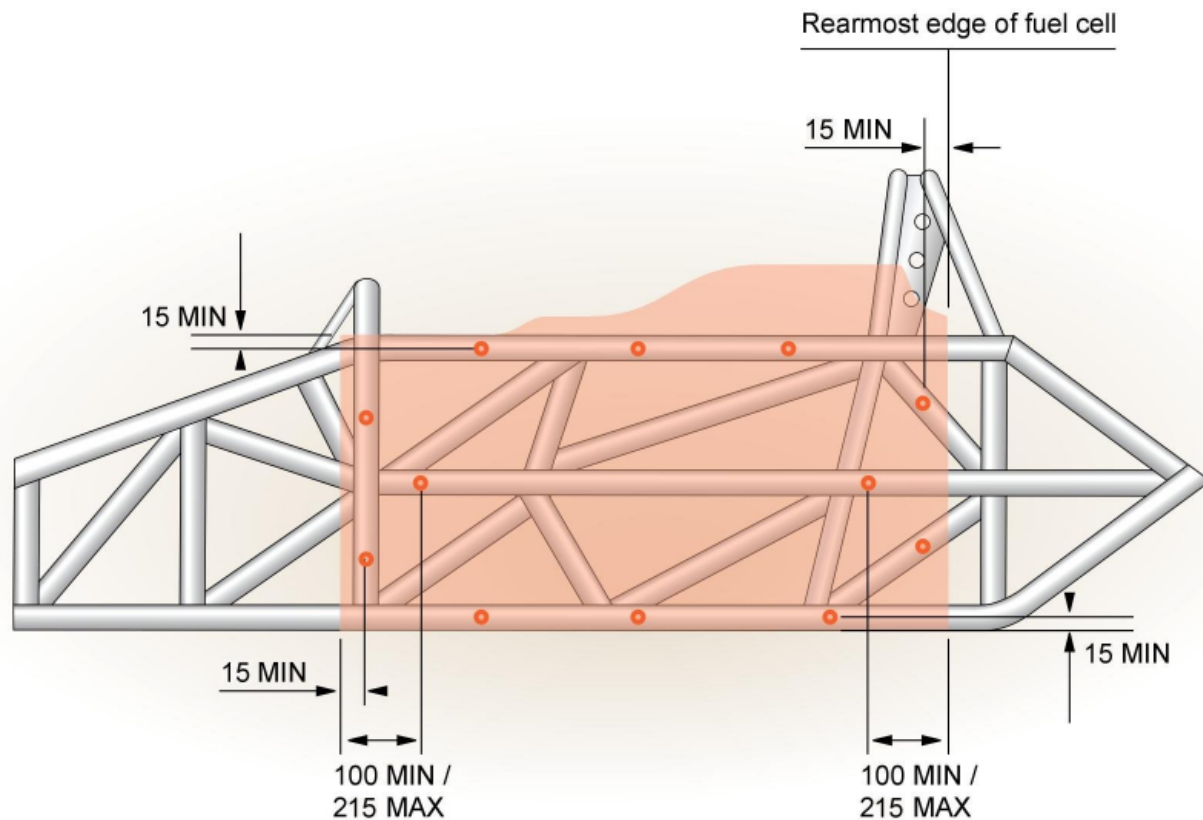
3.4 Voids

The panel shall be essentially void free.

4. ATTACHMENT TO CHASSIS

4.1 Number and position of fixations

Each panel shall be attached to the chassis with 12 fixations as shown in Figure 1; 10 fixations nominally equally spaced around the perimeter of the panel and 2 fixations on the central longitudinal tube.



All dimensions from edge of panel to fixation centre

Figure 1. Attachment positions to chassis

4.2 Specification for chassis tubes

The chassis tubes to which the panel is fixed shall have a minimum tensile strength of 650 MPa and the minimum dimension shall be $\varnothing 30 \times 1.5$ mm (round tubes) or 25 mm x 25 mm (square tubes) with a wall thickness of 1.2 mm.

4.3 Design of fixations

The panel shall be attached using M8 fixations as shown in Figure 2. A threaded top-hat shall be inserted into a $\varnothing 14$ mm hole through the panel and a steel bush shall be inserted into a $\varnothing 14$ mm hole through the chassis tube. The steel bush shall be welded or brazed in position. The M8 bolt shall be grade 12.9.

The dimensions for the threaded top-hat and steel bush are provided in Figure 3.

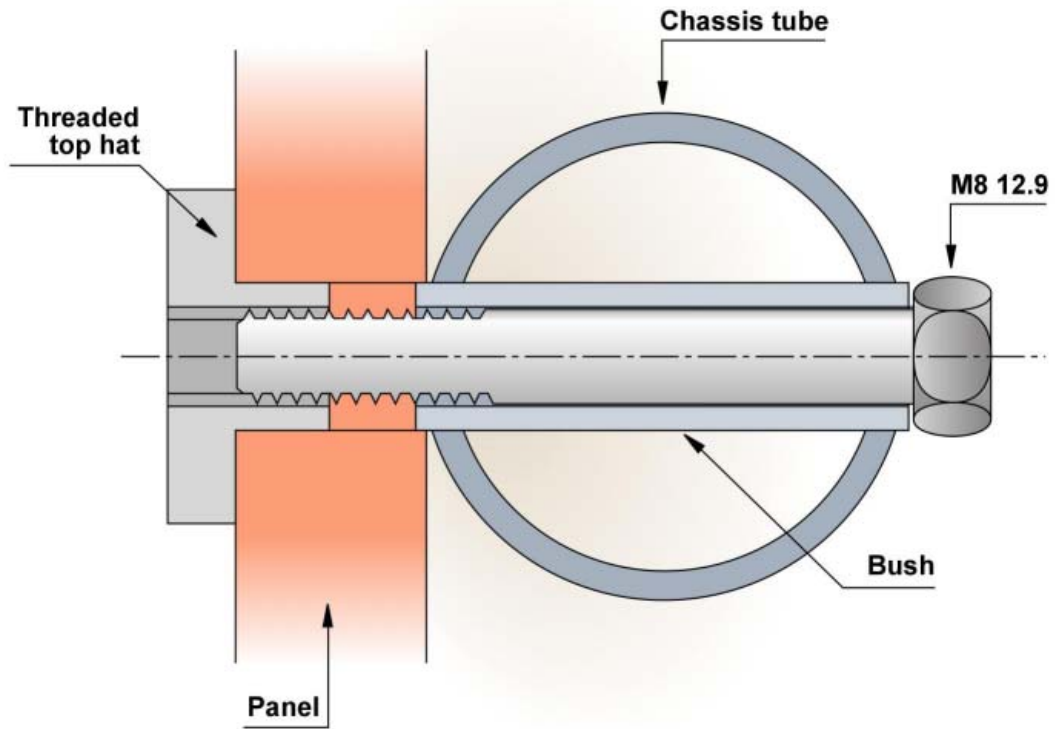


Figure 2. Method for fixing the panel to the chassis

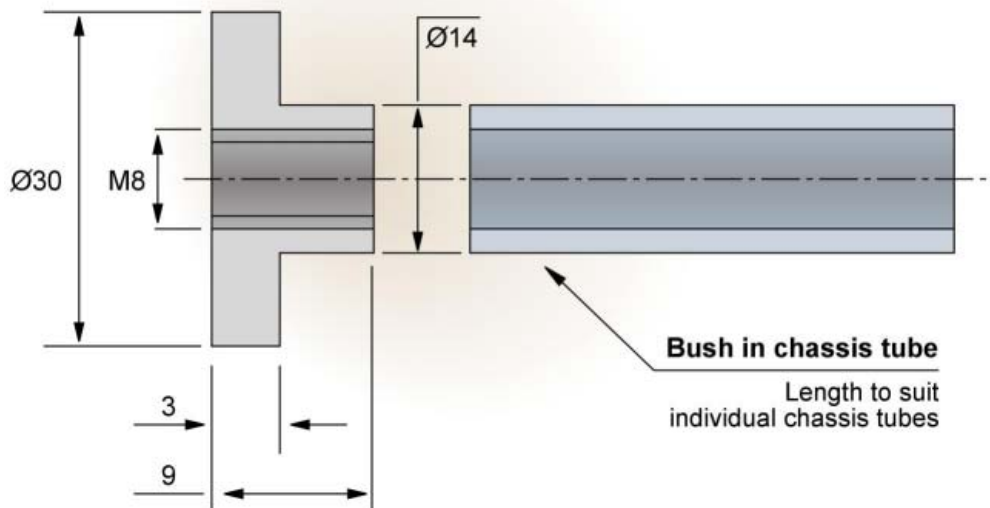


Figure 3. Dimensions for threaded top-hat and steel bush