



Rally Door Foam Installation Guidelines

For Rally Cars of Similar Type to FIA Rally Categories

27 May 2020

Version 1.0

1. INTRODUCTION

The rally-door-foam package is designed to protect the occupants during tree impacts. The most severe accident configuration is when the occupant's head or torso is directly aligned with the centre-line of the tree. However, the dimensions are set so as to manage energy during normal impacts, angled impacts and those where the tree is slightly forward or rearward of the seat-shoulder-plane but would still overlap the occupants head or chest.

The rally-door-foam package also includes a foam element located between the seat-side-head and the side glazing in order to provide energy management between the helmet and the tree, particularly if the car has a roll angle such that the first point of contact (between the car and the tree) is the side glazing rather than the sill or door.

These installation guidelines are based on best practise. The actual safety performance for each car will be somewhat dependent on the precise installation and the following two parameters are highlighted:

1. The thickness of foam (in a lateral direction); it is assumed that the higher the thickness, the higher the benefit.
2. The stiffness of the seat brackets; the energy management of the system is somewhat dependant on the roll stiffness of the seat brackets. A new performance requirement for rally seat brackets is being developed.

It should also be noted that the safety installations apply to both driver and co-driver sides of the car and that the foam material must comply with FIA standard 8866-2016 (FIA Technical List n°58).

2. GUIDELINES

2.1. Modifications to the Door(s) and Rear Quarter Panel

2.1.1 The Original Equipment (OE) door glazing plus window winder mechanisms shall be removed.

2.1.2 The OE door(s) and rear quarter panel glazing can be replaced with 3.8mm $\pm_{0.4}^{+0.4}$ transparent polycarbonate. The attachment method shall ensure rapid removal, without the use of tools, from both inside and outside (bonding is forbidden). An opening aperture may be fitted, within the polycarbonate, to each front door, with a sliding mechanism of the same polycarbonate material.

2.1.3 For the sole purpose of installing the foam (as described in Section 2.3), it is allowed to modify the interior part of the door within the door cavity, **providing the structural and safety performance is not compromised**. In any case, the OE door latch mechanism shall not be modified.

2.2. Window Foam

2.2.1 FIA 8866 energy absorbing foam shall fill the entire volume defined by the lateral area of the seat-side-head projected outwards in a transverse direction to the side glazing or B-pillar (Volume C in Figure 1).

2.2.2 Where Volume C occupies space defined by Volume A (as described in Section 2.3), Volume C shall take priority.

2.2.3 Volume C shall be fixed onto the seat-side-head with Velcro only. A FIA-approved 8855-1999 or 8862-2009 seat with seat-side-head shall be used.

2.3. Door Foam

The door cavity and the space between the outside surface of the seat and the inside of the door shall be completely filled with FIA 8866 foam, forming what is referred to as Volume A and Volume B.

The foam shall conform to the minimum geometry shown in Figure 1, fulfilling the following additional requirements:

2.3.1 The MIN volume VA + VB shall be 60l per side.

2.3.2 The safety cage doorbars and structure of the door may occupy space within Volume A.

2.3.3 The foam elements for VA and VB must be made of the minimum possible number of parts.

2.3.4 The B-pillar shall not be filled with foam.

2.3.5 The inboard surface of Volume B shall be covered by a panel constructed in accordance with one of the following options:

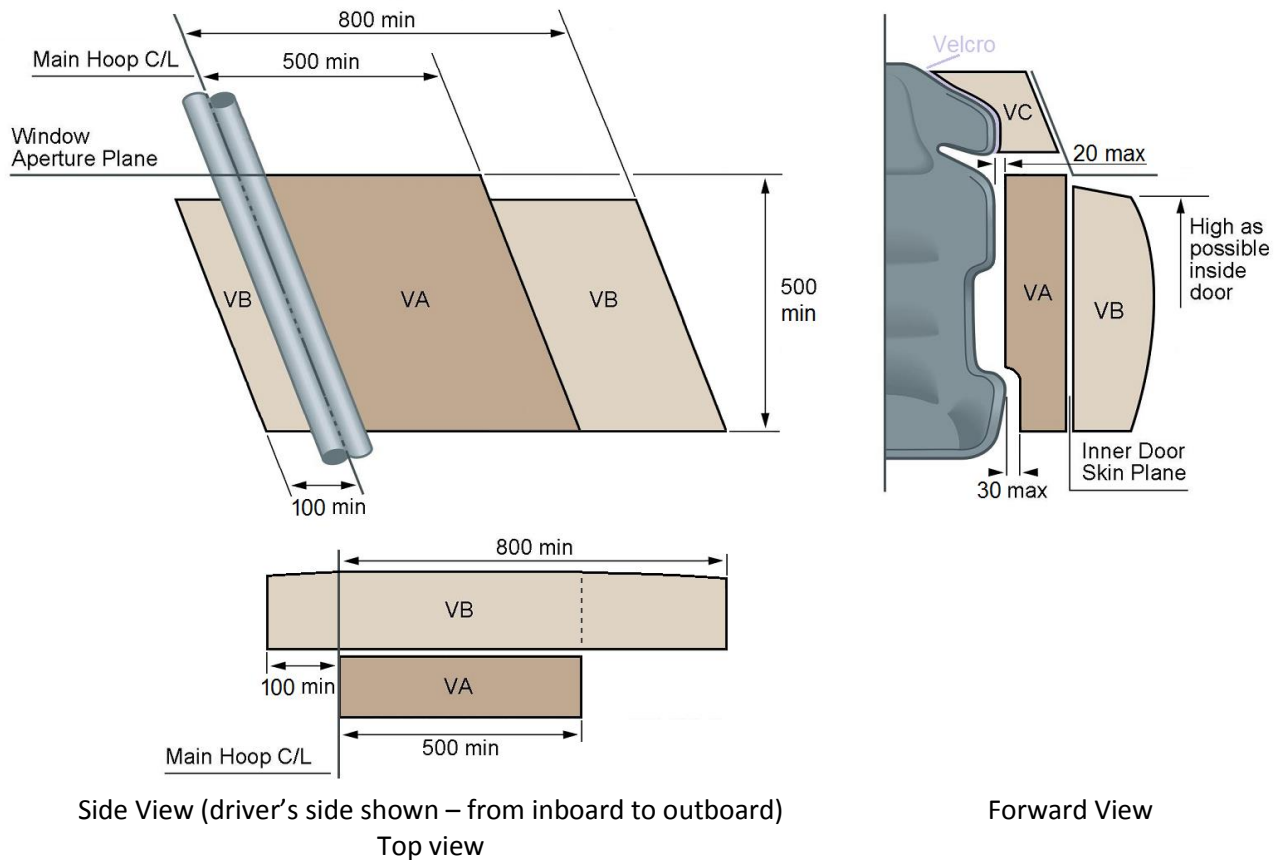
- (i) from solid plies of carbon-kevlar;
- (ii) from distinct solid plies of carbon and solid plies of kevlar, with the inner-most ply (most inboard of the car) being in kevlar in order to keep carbon shards away from the occupants.

For any option chosen, each single ply must **have a fiber areal weight** between 200 ~~gsm~~ g/m² and 300 ~~gsm~~ g/m² of so as to achieve a total **fiber areal** weight that is no less than 1680 ~~gsm~~ g/m².

2.3.6 Cut-outs in Volume A are permitted under the following conditions:

- (i) it must be for the sole purpose of giving the (co-)driver more clearance around the elbow;
- (ii) it must be situated below the bottom edge of the seat-side-shoulder support of the seat and above the top edge of the seat-side-pelvis support of the seat;
- (iii) the total volume of the cut-outs must be less than 2 litres.

Note: Volume B may be split between the front door and the rear quarter panel bodywork (3-door car), or rear door (5-door car), rearward of the B-pillar.



Note: C/L stands for Centre Line.

Figure 1. Minimum geometry for door foam and head foam volumes

2.4. Cover around Volume A and Volume C

2.4.1 A superficial protection in fire-retardant fabric is permitted around Volume A and Volume C. If the protection is bonded onto the volumes, the bonding process shall be validated by the manufacturer of the material referenced on FIA Technical List n°58.