



CROSS COUNTRY SEAT'S FOAM GUIDELINES



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I SCOPE

The aim of these Guidelines is to complement the FIA safety regulations and to supply information on modifications that Cross-Country participants can make to their seats to improve the headrest area comfort. Additionally, these Guidelines provide a suggestion of the types of foams that have improved the situation during the tests done by FIA throughout the years.

These Guidelines document are intended to make the permitted seat modifications clear for competitors and scrutineers.

These Guidelines have no regulatory value and do not replace the official documents published on the FIA website, notably Appendix J, Article 283.

These Guidelines are a living document that can be updated to reflect any new information, updates to regulatory or guidance documents or clarification that the FIA considers relevant to the competitors and officials. Please ensure that you take into consideration the latest available version.

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INTRODUCTION

Since 2009, the FIA has introduced new generations of racing seats featuring extended side head and shoulder supports.

The head and shoulder side supports are designed to better retain the driver's body during high-load lateral and frontal angled impacts.

The seats with enhanced side head and shoulder protection are homologated according to the FIA Standards 8855-2021 and 8862-2009 and are listed in the relevant technical lists.

The introduction of these seats in Cross-Country rallying revealed a specific challenge: the multiple impacts between the helmet and the seat's lateral head supports.

These Guidelines are the result of extensive studies conducted by the FIA and Cross-Country stakeholders, leading to corrective actions aimed at improving the comfort of the seat's headrest.

1. HEAD IMPACT WHILE DRIVING

The seat's headrest comfort is compromised as result of several intersecting factors:

- Stage bumpiness (terrain characteristics)
- Vehicle set-up
- Headrest padding material
- Helmet-to-seat clearance
- Driver positioning and seat sizing

While some of these factors are inherent to racing conditions, these Guidelines provide specific focused on the following three areas:

1. **Driver positioning and seat sizing**
2. **Helmet-to-seat clearance**
3. **Headrest padding material**

2. REGULATION REFERENCES

Seat Guidelines

Seats with the extended Side head and shoulder support are homologated according to the following standards: 8855-2021 and 8862-2009.

All the relevant regulatory information can be found on the Seat Guidelines available on the FIA website.



HEADREST COMFORT IMPROVEMENT MEASURES

Extensive testing has identified several corrective actions to improve the headrest comfort. Achieving optimal results requires a combination of these measures, further refined through fine-tuning based on individual driver ergonomics and preferences.

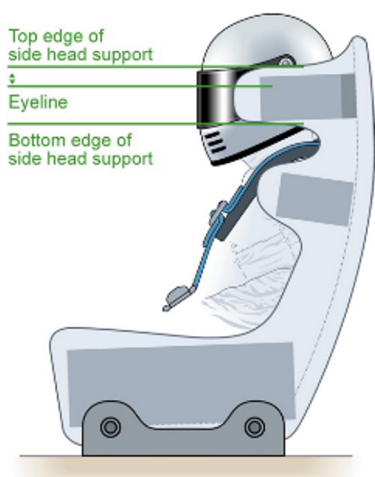
1. DRIVER POSITIONING AND SEAT SIZING

The driver/navigator should choose a seat of the correct size and that fits well.

Using the wrong size seat may render all the headrest comfort improvement measures ineffective.

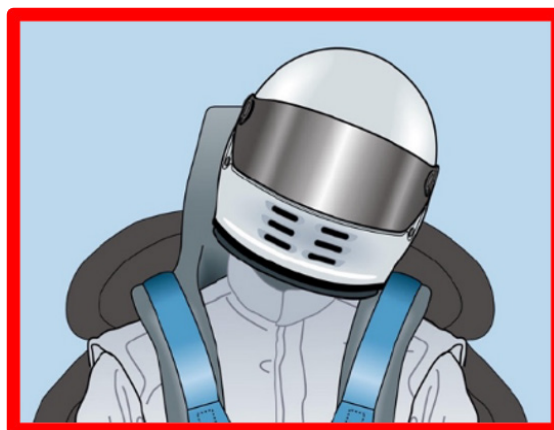
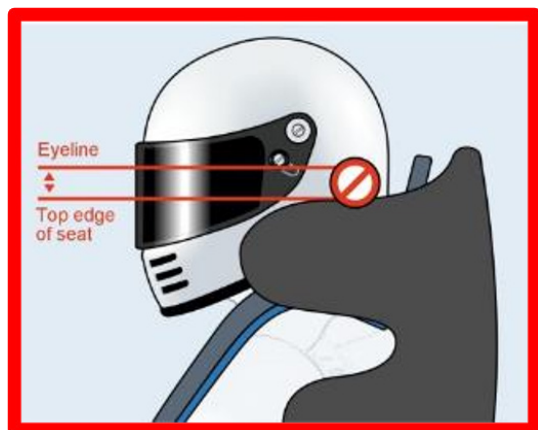
When the driver/navigator is seated in the normal racing position, the seat should provide comfortable support to the pelvis, shoulder and head as follows:

- the eyeline must be below the top edge of the side head support and above the bottom edge of the side head support.
- the shoulder must fit within the side shoulder support of the seat.
- the pelvis must be adequately supported by the side pelvis support.



How to evaluate the correct seat size

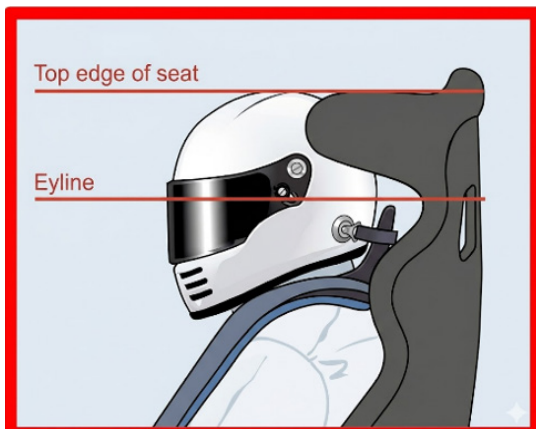
If the driver's helmet is too high in relation to the seat head support, the seat may not provide lateral and rear support to the helmet in the event of a crash.



Example of incorrect position: head is too high in relation to the side seat support

If the driver is seated too high, or too low as shown in the example below, the helmet may roll over around the seat head support.

Both scenarios result in driver discomfort and may increase the risk of neck injuries in the event of an impact.



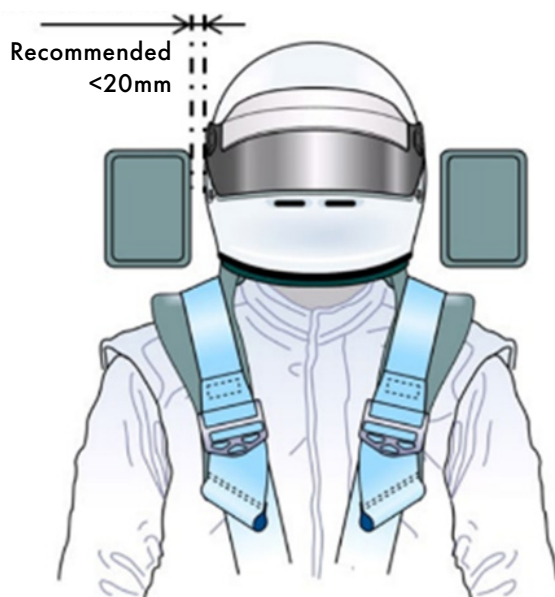
Example of incorrect position: head is too low in relation to the side seat support

For competitions registered on the FIA International Sporting Calendar or competitions regulated in accordance with FIA regulations, officials can deny participation in a competition if the driver/navigator is not seated in the correct position, through checking compliance with the [FIA International Sporting Code](#) under Appendix J (Articles 283), which regulates the seating position as described above.

2. HELMET-TO-SEAT CLEARANCE

The recommended clearance between the helmet and the seat side head support is below 20mm.

This configuration must be coupled with the specific foam modifications described in these Guidelines to effectively improve the headrest comfort.



Updated requirements

3. HEADREST PADDING MATERIAL

For driving comfort, (co-)drivers may consider using add-on padding on the side head supports with the following characteristics.

Ideally, the padding should be composed of a foam assembly constructed using layers of decreasing density, transitioning from the seat shell towards the helmet.

The objective is to ensure the gradual absorption of energy during each impact.

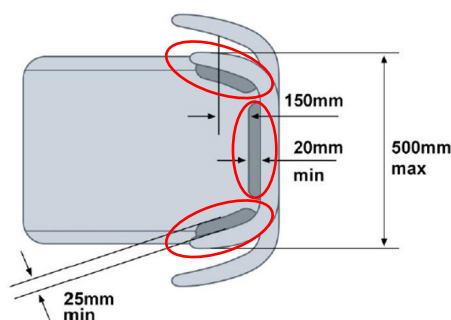
The thickness of each layer of foam can vary according to the driver's preference.

The foam layer closest to the helmet shell must be the softest and most lightweight.

Testing indicates that lighter foams with the lowest elastic rebound properties provide the best performance.

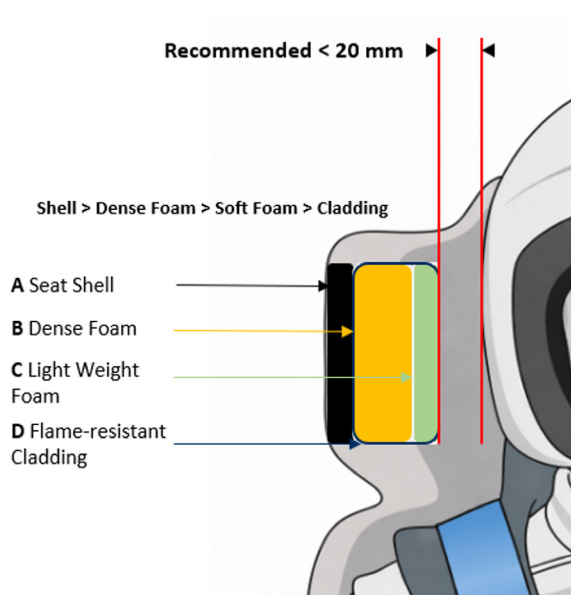
It is highly recommended to add extra foam layers on top of the one already present on the seat.

For the categories specified in **Appendix J, Article 283** only: to accommodate the installation of add-on padding, competitors are permitted to remove the seat's original foam, provided this is done **exclusively in the area surrounding the head**.



Detail of the only foams competitors are allowed to remove or modify

The recommended result of the add-on padding is summarised in the image below.



Recommended helmet surrounding set-up to improve headrest comfort.

3.1 FOAM DEFINITION

The foam market offers a wide variety of options.

The FIA, in collaboration with a team and some crews, has tested a selected range of foams featuring different densities and rebound properties.

While various crews tested multiple configurations using the materials listed in the table below, the following three Assemblies received the most positive feedback.

Competitors are free to experiment with different combinations based on the **'dense-to-lightweight'** principle, utilising either the foams listed in this document or alternative materials.

Foam ID	Definition	Density [kg/m ³]	Compression force deflation [kPa]	Tensile Strength [kPa]	Elongation at break [%]	Compression set [%]	Indentation Force Deflection 25% [N]	Indentation Force Deflection 40% [N]	Indentation Force Deflection 60% [N]
#D1	Confort CF45M	96	5 @40%	117	N/A	N/A	N/A	N/A	213
#D2	High Density Slow-Recovery (LR) Flexible Polyurethane Foam	90	3,5 @40%	100	180	N/A	110	160	320
#D3	Pink Memory Foam	51	12 @40%	125	106	2,0	N/A	N/A	N/A
#L1	Low Density Slow-Recovery (LR) Flexible Polyurethane Foam	40	1,3 @40%	110	150	N/A	43	57	83

Additional Foams Tested

#D4	D/75 High-Density Expanded Polyurethane PUR	72	16,5 @40%	230	120	1,5	540	710	1500
#D5	Closed Cell EPDM rubber	110	37 @25% 101 @50%	434	135	19	N/A	N/A	N/A
#L2	Flexicel High-Lift Expanded Polyurethane PUR	40	8,2 @40%	197	356	2,0	271	333	611

With reference to the definition used so far, and considering the data included in the foam table, foams can be defined as following:

Dense foam

ID#D1 Confor™ CF45M This is the foam originally present on each seat

ID#D2 High Density Slow-Recovery (LR) PUR

ID#D3 Memory Foam Pink

ID#D4 D/75 High Density PUR

ID#D5 Closed Cell EPDM rubber

Lightweight Foam

ID#L1 Low Density Slow-Recovery (LR) PUR

ID#L2 Flexicel High-Lift PUR

Examples of assembly that significantly improved the headrest comfort during tests.

Assembly 1	Assembly 2	Assembly 3
ID#D1 thickness 25mm +	ID#D3 thickness 10mm +	ID#D1 thickness 25mm +
ID#D2 thickness 20mm +	ID#D2 thickness 10mm +	ID#D2 thickness 10mm +
ID#L1 thickness 10mm	ID#L1 thickness 10mm	ID#L1 thickness 10mm
Gap between helmet and seat: 20mm	Gap between helmet and seat: 10mm	Gap between helmet and seat: 20mm

In all cases, the extra foams must be covered by flameproof cladding.

The cladding covering the foams should have the lowest grip and stiffness possible. Increased grip can cause rotation of the helmet, while stiffness could adversely affect the performance of lightweight foams.

To maintain the driver's required field of vision, the foam must be shaped to provide adequate forward clearance and must not obstruct the helmet's peripheral sightlines.

In all cases, the foam padding cannot extend beyond the boundaries of the seat.

■ SCRUTINEERING CORNER

■ 1. PRE-EVENT CONTROLS

Please refer to the latest version of the International Sporting Code, Appendix J, Article 283, in which all the relevant rules and regulations for safety equipment are addressed.



In addition to standard inspections, scrutineers must verify the following:

- All foam and padding within the seat must be covered by flameproof cladding.
- Removable padding must be securely fixed to ensure that it remains attached under racing conditions.
- All foam and padding must remain within the seat profile.

