FIM REQUIREMENTS FOR CATEGORY 3 AIRBAG 2024

2024 VERSION – (03.12.2024)

The category 3 airbag is allowed in the following disciplines where the use of airbag is not forbidden by the FIM regulations.

- Motocross
- Supercross
- Snowcross
- Quadcross
- MX Sidecar
- Supermoto
- Enduro
- Superenduro

All airbags must comply with the requirements detailed below. The following procedures will apply:

- Each different design or model must pass all the tests required into the regulation. Manufacturers will be required to self-certify with the FIM official document that their airbag systems have passed the following requirements.
- If the airbag algorithm is not adapted to one or more of the above disciplines the manufacturer must:
    - Declare the adapted disciplines
    - Advise customers in the airbag manual about the adapted disciplines.

1. GENERAL

The airbag:

- Shall be triggered without requiring the rider to be connected (tethered) to the motorcycle or to add any device on the motorcycle.
- Once triggered, the inflation time must not be greater than 60 milliseconds
- Once inflated, the airbag should remain inflated above the minimum operating pressure declared by the manufacturer at least 5 seconds. The pressure should decrease automatically after these 5 seconds and should be below 70% of the operating pressure 30 seconds after triggering. The deflation of the airbag must be automatic (air leakage).
- Optional: an accessible manual device clearly identified by the manufacturer is allowed in addition of the initial requirement hereabove, in order to speed up the deflation of the airbag, if wanted.
- Must be designed in such a way that if accidental deployment occurs, the rider has the ability to keep riding the motorcycle and to not lose the control of the motorcycle. Each manufacturer declares the reliability of its airbag system, based on internal tests implying a real inflation while a rider is riding.
- The product size must be compatible with the body measurements and also the anthropometry of the rider.
- Must be designed to guaranty a breathable fabric/material and a total weight adapted to the rider comfort and safety.
- The detection system/algorithm/protocol must be adapted for the concerned disciplines (i.e race mode, etc..) including ruts, berms, and different configurations of jumps and whoops and rider contacts.
- The airbag's area of protection must correspond to at least the minimum protection detailed in Section 2.
- The airbag system must be compatible with the use of EN 1621 chest and back protectors, if not included in.
- Passive protectors certified according to EN1621-2 for back protector and EN1621-3 for chest protector, must be used in addition of the airbag system, if not included in.
- The airbag manufacturer should recommend the better position of the passive protectors (if not included) for a more efficient energy absorption depending on the airbag design.:
- During deployment, the Airbag must not cause injury to the rider and the other riders.
- The manufacturer can prove the reliability of its detection algorithm by at least 10 representative triggering cases based on video, photo, stunts, testimonies, race data crash acquisition or simulation.

If video and/or photos are joined they must be synchronized with a timing measurement to show the detection performance. It will allow the examination based on visual control.
In addition to this list of such evidence the manufacturer must demonstrate that the airbag does not inflate when the rider ride in whoops and jumps.
The FIM can ask more details and data for each evidence and can contact also the rider involved.
The airbag manufacturer must be able to provide the detailed data required by FIM.

2. ASSESSMENT OF IMPACT ENERGY ABSORPTION

a) Minimum dimension of the protection areas

The airbag should cover at least chest, back and collarbone areas and provide protection to at least chest and back, as pictured in Figure 1, 2 and 3. It is highly recommended to cover the shoulders and the ribs (1 to 7 at least, up to 9 is better) including the lateral sides of the body.

Each manufacturer can extend the protectiveness of their systems.

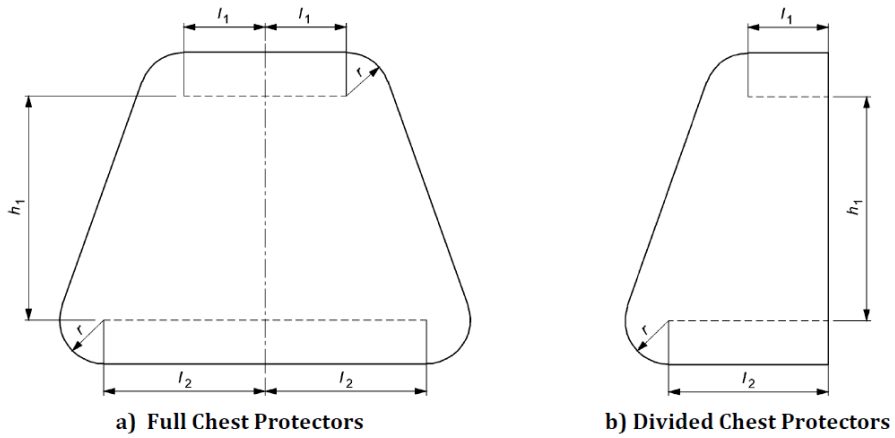

Figure 1: minimum chest protection EN1621-3

Type	Dimensions of Figure 1 in mm			
	r	l_1	l_2	h_1
A	25	42	84	118
B	30	50	100	140

NOTE The type B protector dimensions are intended to cover the needs of most motorcycle riders. However, for ergonomic reasons, in certain cases the type B protectors may be unsuitable. In such cases, the alternative type A protectors can be chosen by the user.

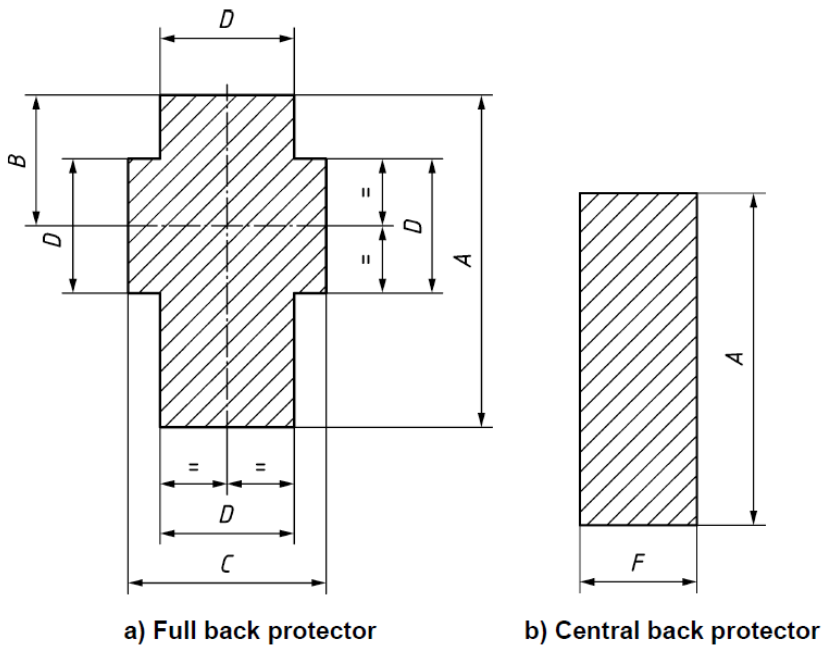

Figure 2: Minimum back protection EN1621-2

Dimensions					
A	B	C	D	E	F
72 %	29 %	44 %	29 %	32 %	25 %
NOTE	All dimensions refer to the waist to shoulder length (100 %) of the biggest user.				

Figure 3: covered area protection

Requirements:

- Areas are defined as a general basis but may vary depending on airbag technologies employed and morphology of the riders.
- The airbag associated to the chest protector, shall be designed to improve the impact energy absorption on the areas defined in the standard 1621-3. (A or B template)
- The airbag associated to the back protector, shall be designed to improve the impact energy absorption on the areas defined in the standard 1621-2. At least central back protection is mandatory.
- For EN passive back protector (EN 1621-2) Full or Central back protector is mandatory.
- For areas not covered by an existing standard, dimensions, and shape of the template for the testing method must be supplied by the manufacturer to the FIM Technical Commission (frhp@fim.ch).

b) Impact attenuation requirements

The airbag system must be CE approved (according to the Regulation EU 2016/425) and cover at least the areas included in this document.
If the airbag is not CE approved, it must be compliant with the following test process.

An impact test according to the testing method described in the norm EN1621-1, EN1621-2, EN1621-3 if concerned, has to be carried out on the area covered with the following inclusions/modifications.

The full gear (airbag system + suit/shirt + protectors) has to be tested in the inflated status at the minimum operating pressure declared by the manufacturer.

2 impacts are tested per area: The average peak force of all measurements shall be below 18kN and at least one of the values shall be below 4.5 kN (see Table 2).

Average peak force	≤ 18 kN
Peak force of at least one value	≤ 4,5 kN

Table 2 — Impact attenuation performance

3. ASSESSMENT OF HARD COMPONENTS

Hard components are defined as the electronic unit, airbag inflator and battery (if separated). They must be designed to avoid any risks of additional injury with or without an airbag inflation.

When assembled in the rider gear, hard components must guarantee impact protection according to EN1621-1, without airbag inflation. The peak force recorded after a single impact shall be below 35 kN (Table 3).

Single strike	≤ 35 kN

Table 3 — Impact attenuation performance

All batteries must pass the following conditions at the time of the impact and for the next 12 hours after the test.

- Do not catch fire or make any sparks
- Do not release any gases or liquid
- Do not change size (other than that caused by the impact test)

The electronic unit must have an operational life of 8 hours minimum between each full charge cycle.

4. EQUIPMENT AND TEST METHODS

All impact tests are done with the same equipment and test methods as described in the standards EN1621-1, EN1621-2 and 1621-3.

The values of performance requirement for each part, are given in the above paragraphs.