

Pyrotechnic Families Guidance – Pyrotechnic articles for vehicles

Guidance on grouping Pyrotechnic articles for vehicles into families for CE certification is outlined below. This guidance is applicable to P1 and P2 Pyrotechnic articles for vehicles. The minimum Type Test requirements must be achieved in order for the families grouping guidance to be applied.

1. General Requirements for grouping variants into a family

All variants of a family:

- shall be of the same generic type
- shall be of the same category (P1 or P2)
- shall have similar relevant performance parameters, e.g. as described in EN ISO 14451-Parts 4 - 10,
- shall be of a similar geometrical shape,
- can have variations in the NEC¹

2. Specific requirements for grouping variants into family

2.1 Gas generators

All variants of a family:

- can have variations in: igniters, autoignition units, diffusors, generant and inner streaming relevant parts,
- shall have similar casing materials,
- shall not have variations in: number of stages, types of gas generation (pyrotechnic, hybrid, compressed gas).

2.2 Airbag modules

All variants of a family:

- can have variations in: actuators, dimension of mounting plates, gas baffle plates/tubes, form of the bag, type and number of brackets/clips,
- shall have similar casing materials,
- shall not have variations in: intended use (driver or passenger module...), family and number of gas generators, position of gas generator (e.g. midfill or endfill).

2.3 Seatbelt pretensioners

All variants of a family:

- can have variations in: micro gas generator,
- shall not have variations in: propulsion method (e.g. cable pull, ball drive, rack and pinion drive).

¹ In case of large variations, e.g., the minimum and maximum (or most hazardous) shall be tested.

2.4 Actuators

All variants of a family:

- can have variations in: igniters, micro gas generators,
- can have variations in external shape,
- shall not have variations in: functioning (e.g. cutter, propulsion piston).

2.5 Micro gas generators

All variants of a family:

- can have variations in igniters,
- can have variations in lengths, but not more than $\pm 15\%$ in diameter of the tube, containing the pyrotechnic composition,
- shall have similar casing materials,
- shall not have variations in: pyrotechnic composition.

2.6 Igniters

All variants of a family:

- can have variations in: $\pm 20\%$ for nominal all-fire and no-fire current as well as $\pm 20\%$ for nominal resistance,
- can have variations in lengths, but not more than $\pm 15\%$ in diameter of the tube containing the pyrotechnic composition,
- shall have similar casing materials,
- shall not have variations in: pyrotechnic composition.

3. Testing criteria

Due to the similarity in design, function or behaviour of one generic type, not all variants within a family need to be tested.

It should be noted that this guidance indicates the MINIMUM sampling regime and that larger numbers of items may be tested if a Notified Body considers this necessary.

As a minimum, the number of samples specified in EN ISO 14451 Part 4 - 10 from each family shall be tested. For each testing condition (e.g. as received, Vibration and temperature conditioning, Thermal humidity cycling conditioning) the Notified Body can choose samples from the same or different variants.

The necessity for testing of variants that are to be added to an existing family will be at the discretion of the Notified Body and will be decided on a case-by-case basis.