

## **Pyrotechnic families guidance – Theatrical pyrotechnic articles**

Guidance on grouping Theatrical pyrotechnic articles into families for CE certification is outlined below. This guidance is applicable to T1 and T2 Theatrical Pyrotechnic articles. Annex 1 provides examples of variants that can and cannot be grouped into a family.

The minimum Type Test requirements must be achieved in order for the families grouping guidance to be applied.

### **1. Requirements for grouping variants into a family**

All variants of a family shall:

1. be of the same category and sub-category (T1 or T1 for outdoor use only)
2. be of the same generic type,
3. have similar design:
  - 3.1. Similar internal design<sup>1</sup>, which means:
    - 3.1.1. Same means of ignition (see prEN 16256-3 clause 6, Table 4.)
    - 3.1.2. Similar mechanism of pyrotechnic functioning
    - 3.1.3. Similar type of pyrotechnic units.
  - 3.2. Similar external design if this can have a significant effect on performance parameters<sup>2</sup>
4. have chemical (pyrotechnic) compositions with similar resulting effects.<sup>3</sup>

### **2. Type test requirements**

Selecting variants from a pyrotechnic family in order to Type Test it is dependent on the number of variants within the family. Table 1 summarises the sampling regime.

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.

If the variants of a family differ only in their colour effects (design and performance parameters are unchanged), then not all colour variants need to be tested.

#### **Assessment of families with up to 5 variants submitted in the initial assessment**

A total of at least 33 items from the family shall be tested

A number of individual items from each variant shall be tested, some as received, some after mechanical conditioning and some after thermal conditioning (See Table 1)

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<sup>1</sup> Variations in numbers of pyrotechnic units are permitted

<sup>2</sup> This includes variations of calibres

<sup>3</sup> Variations in colours are not considered as different resulting effects

### **Assessment of families with more than 5 variants submitted in the initial assessment**

Five 'benchmark' variants should be tested as in the case of a 5 variants family (see Table 1). These should represent the range of different variants within the family and would be expected to include the variant considered to be the 'worst case', i.e. potentially poses the greatest hazard.

All other variants in the family must also be tested as indicated in Table 1. Where these variants differ significantly from the benchmark variants thermal and mechanical conditioning should also take place.

### **Assessment of variants for inclusion in an existing family**

Five individual items of each variant shall be tested as received unless the variant differs significantly from the tested benchmark variants. In that case tests after thermal and mechanical conditioning should also be considered (see Table 1)

**Table 1: Sampling Regime for Type Testing of Theatrical Pyrotechnic Families for CE Certification**

<b>Initial assessment of families with up to 5 variants</b>						
	No. of variants per family	No. of items to be tested per variant				Total no. items tested
		As received	Mechanically conditioned	Thermally conditioned	For dismantling	
Benchmark variants	1	10	10	10	3	33
	2	5	5	5	1 or 2**	33
	3	3 or 4*	3 or 4*	3 or 4*	1	33
	4	2 or 3*	2 or 3*	2 or 3*	0 or 1	33
	5	2	2	2	0 or 1	33
Initial assessment of families with more than 5 variants: 5 benchmark variants shall be tested as above. Additional variants shall be tested as indicated below.						
<b><u>OR</u></b>						
Assessment of additional variants to be added to an existing family. Perform testing as indicated below.						
Consideration	No. of items to be tested per variant					Total no. of additional items per variant
	As received	Mechanically conditioned	Thermally conditioned	For dismantling		
Variants with similar pyrotechnic composition to tested benchmark variants or where thermal and mechanical conditioning are otherwise not considered necessary.	5	0	0	0		5
Variants with significantly different pyrotechnic composition to tested benchmark variants or where thermal and mechanical conditioning are otherwise considered necessary	1	2	2	0		5
* with a mandatory total of 10 articles tested ** with a mandatory total of 3 articles dismantled						

**Annex 1: Examples showing whether family grouping is allowed**

No.	Description	Can they be considered within the same family?
1	<b>Bengal Stick A</b> (green effect, NEC = 45 g) and <b>Bengal Stick B</b> (green effect, NEC = 60 g)	No, violation of no. 1 (not the same category: T1 ‘for outdoor use only’ and T2, respectively)
2	<b>T1 Fountain A</b> (effect distance 8 m) and <b>T1 Fountain B</b> (effect distance 10 m) with same effects and burning times	No, violation of no.1 (not the same sub-category: T1 and T1 ‘for outdoor use only’)
3	<b>T1 Fountain A</b> (effect distance 10 m) and <b>T1 Fountain B</b> (effect distance 12 m) with same effects and burning times	Yes
4	<b>Maroon</b> and <b>Theatrical flash</b>	No, violation of no. 2
5	<b>Fountain A</b> (effect distance 5 m, silver sparks, time 1 s) and <b>Fountain B</b> (effect distance 5 m, silver sparks, time 5 s)	No, violation of no. 2 (Fountain A is actually a Jet)
6	<b>Fountain A</b> (effect distance 5 m, silver sparks, time 5 s) and <b>Fountain B</b> (effect distance 5 m, silver sparks, time 10 s)	Yes
7	<b>Smoke Device A</b> (electric ignition) and <b>Smoke Device B</b> (friction head), same effects and performance parameters	No, violation of 3.1.1
8	<b>Comet A</b> (effect is a green pyrotechnic star) and <b>Comet B</b> (effect is report bombette)	No violation of 3.1.3

No.	Description	Can they be considered within the same family?
9	<b>Mine A</b> (calibre 20 mm, effect distance 20 m) and <b>Mine B</b> (calibre 25 mm, effect distance 22 m)	Yes
10	<b>Mine A</b> (calibre 20 mm, effect distance 20 m) and <b>Mine B</b> (calibre 40 mm, effect distance 40 m)	No, violation of 3.2
11	<b>Mine A</b> (calibre 20 mm, effect distance 20 m, NEC = 30g) and <b>Mine B</b> (calibre 20 mm, effect distance 25 m, NEC = 35g)	Yes
12	<b>Comet A</b> (green pyrotechnic star) and <b>Comet B</b> (red pyrotechnic star)	Yes
13	<b>Maroon A</b> (NEC = 10 g black powder) and <b>Maroon B</b> (NEC = 4 g nitrate/metal composition)	No, violation of no. 4
14	<b>Airburst A</b> (NEC = 35 g, 90 dB(AI <sub>max</sub> )) in 8 m and <b>Airburst B</b> (NEC = 40 g, 98 dB(AI <sub>max</sub> )) in 8 m	Yes
15	<b>Airburst A</b> (NEC = 35 g, 90 dB(AI <sub>max</sub> )) in 8 m and <b>Airburst B</b> with a significantly bigger outer dimension (NEC = 100 g, 130 dB(AI <sub>max</sub> )) in 8 m	No, violation of 3.2
16	<b>Roman Candle A</b> (8 shots, effect distance 30 m) and <b>Roman Candle B</b> (6 shots, effect distance 25 m)	Yes
17	<b>Roman Candle A</b> (tube length 40 cm, 8 shots, effect distance 30 m) and <b>Roman Candle B</b> (tube length 20 cm, same calibre, 4 shots, effect distance 15 m)	No, violation of 3.2