

ICTI Review of International Flammability Standards Comparison Table

EN71-2:2006 + A1:2007 ISO8124-2:2007 ASTM F963-07

Flammability

Flammability in both the EN and ISO Standards is addressed separately and published as Part 2. Flammability is therefore more extensively covered in EN and ISO than in ASTM.

ASTM relies on the CFR documents 16 CFR 1,500.3, with test requirements as per 16 CFR 1610 and 16 CFR 1,500.44. In contrast, Part 2 of the other standards relates to the type of toy and the hazards represented in this product category.

The attached table of Comparisons of Flammability Requirements illustrates differences across EN (Part1), ISO (Part 1) and ASTM Standards and makes recommendations for their harmonisation across all 3 with the general principle of providing the best protection for the consumer.

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Flammability Standard Comparison

EN71-2:2006 + A1:2007 / ISO8124-2:2007 / ASTM F963-07

Comparison item	EN71-2:2006+A1:2007 / ISO 8124-2:2007		ASTM F963-07	
	General requirement	Methods	Requirements	Requirements
	No testing	<p>Show materials shall not be used in manufacture of toys:</p> <ol style="list-style-type: none"> 1. Celluloid 2. Piled surface which produce surface flash 3. Highly flammable solids 4. Flammable gases 5. Highly flammable liquids 6. Flammable liquids 7. Flammable gels <p>Item 1, 4 – 7 have some exceptional cases</p>	<p>Materials other than textiles (excluding paper) used in toys are subject to this clause.</p> <ol style="list-style-type: none"> 1. Measure the dimensions of the sample, and support it by means of the test fixture or equivalent, so that the major axis is oriented horizontally. 2. One or more specimens shall be ignited at one end of the major axis, and, when practical, one or more specimens shall be ignited at the opposite end of the major axis. Specimens shall be positioned in the worst case position, as dictated by experience. 3. Hold a burning paraffin candle whose diameter is at least 1 in. (25 mm) so that the flame is a minimum of 5/8 in. (16 mm) high, with the tip of the inner cone of the flame in contact with the surface of the sample at the end of the major axis for 5 s. Maintain contact of the candle with the sample for 5 s or until ignition occurs. If the sample melts away from the flame, move the candle and maintain contact for the full 5 s or until the sample ignites. If the ignition occurs immediately, hold the candle steady and allow the ignited flame to move away. 4. Remove the candle. Determine the time of combustion by means of a stop watch. Do not allow the test time to exceed 60 s with a self-sustaining flame. 5. Measure the length of the burned area, and calculate the rate of burning along the major axis of the sample. 	<ol style="list-style-type: none"> 1. Products that do not ignite are considered acceptable. 2. No burn rate is calculated for these samples. The burn rate for products that self-extinguish in less than 60 s shall be computed by using the actual burning time as the denominator when calculating the burn rate. 3. A toy shall be considered a flammable solid if it ignites and burns with a self-sustaining flame at a rate greater than 0.10 in./s (2.5 mm/s) along its major <p>Note: accessible components having a major dimension of 1 in. (25 mm) or less is exempted from the requirement.</p>

Comparison Item	EN71-2:2006+A1:2007 / ISO 8124-2:2007		ASTM F963-07	
	Methods	Requirements	Methods	Requirements
Beards, moustaches, wigs, etc., made from hair, pile or material with similar features, which protrude more than or equal to 50 mm from the surface of the toy	<ol style="list-style-type: none"> 1. Adjust the flame height to (20 ± 2) mm. 2. Vertical flame 3. the largest dimension of the hair, pile or material with similar features hangs vertically or as near vertically as possible 4. Apply the test flame for (2 ± 0.5)s to the lower edge or ends of the sample material so that the flame penetrates the element by approximately 10 mm. 	Duration of flaming shall not be more than 2 s after removal of the test flame If ignition occurs: a) not more than 50 % of the greatest initial length, when the initial length was 150 mm or more; b) not more than 75 % of the greatest initial length, when the initial length was less than 150 mm	For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles. For rigid and pliable solid refer to the part of flammability for solid.	
Beards, moustaches, wigs, etc., made from hair, pile or material with similar features, which protrude more than or less than 50 mm from the surface of the toy	<ol style="list-style-type: none"> 1. Adjust the flame height to (20 ± 2) mm. 2. Move the burner to an angle of 45°. 3. Position the toy vertically. 4. Apply the test flame to the toy for (5 ± 0.5) s, so that the test flame makes contact at least 20 mm above the lower edge of the toy and/or attachment and with a distance measured from the closest point of the burner tube, horizontally to the surface of the toy of approximately 5 mm. 	Duration of flaming shall not be more than 2 s after removal of the test flame Duration of flaming shall not be more than 70mm	For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles. For rigid and pliable solid refer to the part of flammability for solid.	
Full or partial moulded head masks	<ol style="list-style-type: none"> 1. Adjust the flame height to (20 ± 2) mm. 2. Move the burner to an angle of 45°. 3. Position the toy vertically. 4. Apply the test flame to the toy for (5 ± 0.5) s, so that the test flame makes contact at least 20 mm above the lower edge of the toy and/or attachment and with a distance measured from the closest point of the burner tube, horizontally to the surface of the toy of approximately 5 mm. 	Duration of flaming shall not be more than 2 s after removal of the test flame Duration of flaming shall not be more than 70mm	For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles. For rigid and pliable solid refer to the part of flammability for solid.	

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	Methods	Requirements	Methods	Requirements
Flowing elements of toys to be worn on the head	<p>1. Position the sample holder at (45 ± 1) ° to the horizontal.</p> <p>2. Adjust the flame height to (40 ± 3) mm.</p> <p>3. Position the burner vertically in order to have a distance between the edge and the top of the burner of (30 ± 2) mm</p> <p>4. Maintain the burner with the flame as indicated above for (10 ± 1) s.</p>	<p>Rate of spread of flame of the material shall not exceed 10 mm/s or shall self-extinguish before the second marker thread is severed</p>	<p>For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles.</p> <p>For rigid and pliable solid refer to the part of flammability for solid.</p>	
Toy disguise costumes and toys intended to be worn by a child in a play	<p>1. Position the sample holder at (45 ± 1) ° to the horizontal.</p> <p>2. Adjust the flame height to (40 ± 3) mm.</p> <p>3. Position the burner vertically in order to have a distance between the edge and the top of the burner of (30 ± 2) mm</p> <p>4. Maintain the burner with the flame as indicated above for (10 ± 1) s.</p>	<p>Rate of spread of flame shall not exceed 30 mm/s or shall self-extinguish before the second marker thread is severed.</p> <p>Rate of spread of flame is between 10 mm/s and 30 mm/s, both the toy and the packaging shall be permanently marked with the following warning: "Warning! Keep away from fire"</p>	<p>Unstuffed textile fabrics and removable unstuffed toy clothing are tested separately according to 16 CFR 1610 as described below:</p> <p>Each specimen cut from the textile shall be inserted in a frame, brushed if it has a raised-fiber surface, and held in a special apparatus at an angle of 45°. A standardized flame(16mm/0.625in) shall be applied to the surface near the lower end of the specimen for 1 second, and the time required for the flame to proceed up the fabric a distance of 127 mm (5in) shall be recorded.</p> <p>Classification of textile:</p> <p>Textiles are classified into 3 different classes according to 1610.6.</p> <p>Class 1 - Textiles exhibit normal flammability.</p> <p>1.1 Plain surface textile fabric</p> <p>1.2 Raised surface textile fabric</p> <p>Class 2 - Textiles exhibit intermediate flammability</p> <p>2.1 Raised surface textile fabric</p> <p>Class 3 – Textiles exhibit rapid and intense burning, are dangerously flammable</p> <p>3.1 Plain surface textile fabric</p> <p>3.2 Raised surface textile fabric</p>	<p>Class 1.1</p> <p>Burn time should be 3.5 seconds or more.</p> <p>Class 1.2</p> <p>Burn time should be greater than 7 seconds or 0-7 seconds with no base burns. Exhibits rapid surface flash only.</p> <p>Class 2.1</p> <p>Burn time should be 4-7 seconds with base burn.</p> <p>Class 3.1</p> <p>Burn time should be 3.5 second or more.</p> <p>Class 3.2</p> <p>Burn time should be 4 seconds or more with base burn.</p>

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	Methods	Requirements	Methods	Requirements
Toys intended to be entered by a child	<ol style="list-style-type: none"> 1. Position the sample holder at (45 ± 1) ° to the horizontal. 2. Adjust the flame height to (40 ± 3) mm. 3. Position the burner vertically in order to have a distance between the edge and the top of the burner of (30 ± 2) mm 4. Maintain the burner with the flame as indicated above for (10 ± 1) s. 	<p>Rate of spread of flame shall not exceed 30 mm/s or shall self-extinguish before the second marker thread is severed</p> <p>If the sample has a rate of spread of flame greater than 20 mm/s, there shall be no flaming debris or molten drips.</p> <p>Rate of spread of flame is between 10 mm/s and 30 mm/s, both the toy and the packaging shall be permanently marked with the following warning: "Warning! Keep away from fire".</p>	For unstuffed textile fabrics refer to the part of flammability for textiles.	
For EN71-2:	<ol style="list-style-type: none"> 1. Adjust the flame height to (20 ± 2) mm. 2. Move the burner to an angle of 45°. 3. Position the toy vertically, i.e. with the head uppermost, if it has one, or otherwise so that the toy presents the maximum unhindered vertical area of its surface to the spread of flame. 4. Apply the test flame to the toy for (3 ± 0,5) s so that the distance between the edge of the burner tube and the toy is approximately 5 mm and the test flame makes contact between 20 mm and 50 mm above the lower edge of the most flammable material of the toy, as predetermined. 	The rate of spread of flame on the surface shall not be more than 30 mm/s or shall self-extinguish	For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles. For rigid and pliable solid refer to the part of flammability for solid.	
Soft-filled Toys				
For ISO 8124-2, soft filled toys with a maximum dimension of 520mm				

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	Methods	Requirements	Methods	Requirements
<p>Not applicable for EN 71-2 in this section</p> <p>*For ISO 8124-2, soft filled toys with a maximum dimension greater than 520mm</p>	<ol style="list-style-type: none"> 1. Adjust the flame height to (20 ± 2) mm. 2. Move the burner to an angle of 45°. 3. Apply the test flame to the toy for (3 ± 0.5) s so that the distance between the edge of the burner tube and the 4. toy is approximately 5 mm and the test flame makes contact between 20 mm and 50 mm above the lower 5. Edge of the vertical area to be tested. 	<p>*For EN 71-2, requirement of soft filled toys is covered in one section only (no maximum dimension concern)</p> <p>*For ISO 8124-2, rate of spread of flame on the surface shall not be more than 30 mm/s.</p>	<p>For unstuffed textile fabrics and removable unstuffed toy clothing refer to the part of flammability for textiles.</p> <p>For rigid and pliable solid refer to the part of flammability for solid.</p>	