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ASTM D6545
Flammability of Children's Sleepwear

- Scope: this test method evaluates the relative flammability of textile materials and garments intended for use in children's sleepwear
- This method follows procedures used to evaluate the flammability of children's sleepwear contained in 16CFR 1615 and 1616
- Textile products used for children's sleepwear must be tested in the original as received state and after 50 laundering and dry cycles to assess the flame resistance relative to the textile and relative life use

Summary of Test Method

A textile product's flammability is determined by placing the test specimen into a holder, mounted vertically into the test chamber, exposing it to a 38mm flame for 3s and determining the extent of flame spread from the lower edge of flame exposure to the point at which the specimen ceases to burn and tear through the charred edge.

Significance and Use

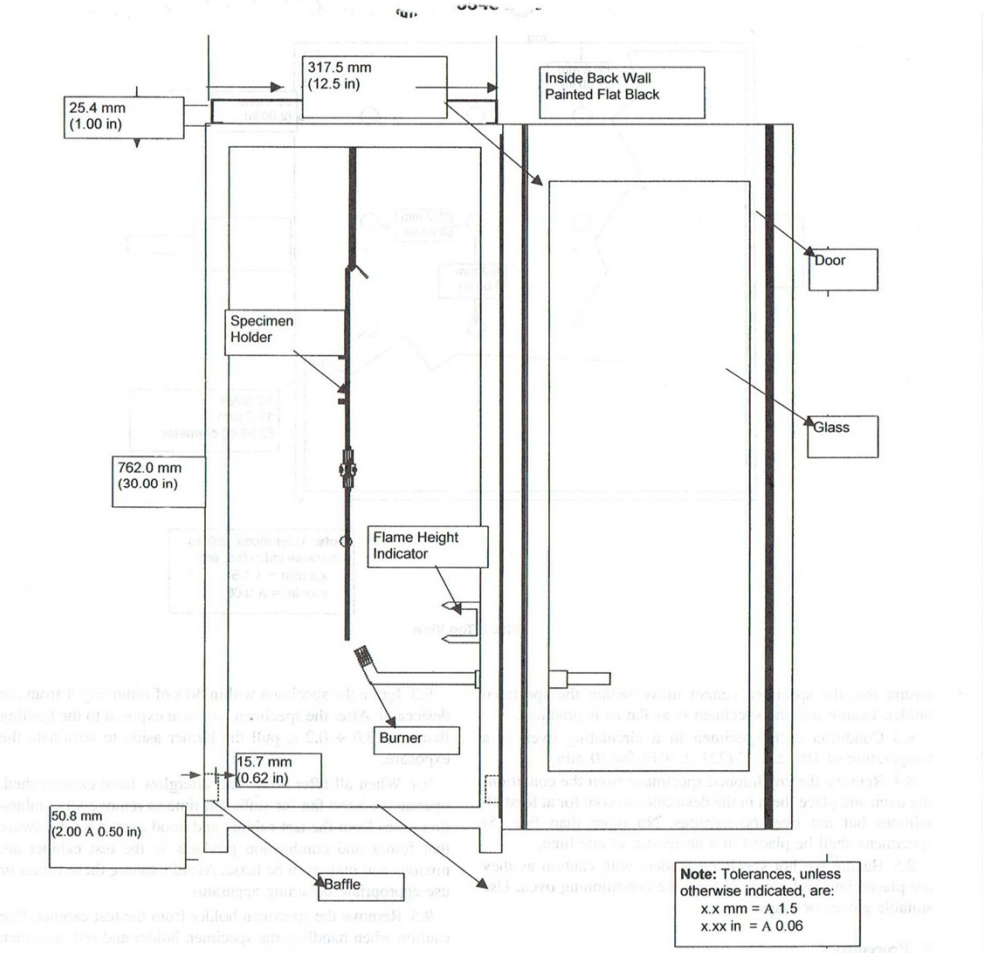
- This test method is used to evaluate the flammability characteristics and laundering durability of textile materials used in children's sleepwear. It is not designed or suitable for evaluating the flammability characteristics of other textile products. This method may be used to train lab technicians in vertical flammability testing.

- The procedure for flammability testing in this method is technically equivalent to 16CFR 1615,1616 and does not include detailed specimen sampling plan required by the Federal Regulation. Consult 16CFR 1615,1616 for information on operations

Apparatus and Materials

- Test chamber for use in testing flammability of children's sleepwear with frame perpendicular to the door to suspend specimen holder
- Specimen holder consisting of 2 U-shaped metal frames described in the method
- Burner described in method
- Gas supply system with pressure regulator
- Certified Gas- at least 97% pure methane
- Hooks and weights to load tested specimen
- Calibrated timer accurate to 0.1s
- Lab drying oven and desiccator, draft-free lab hood

Vertical Chamber



Test Frame

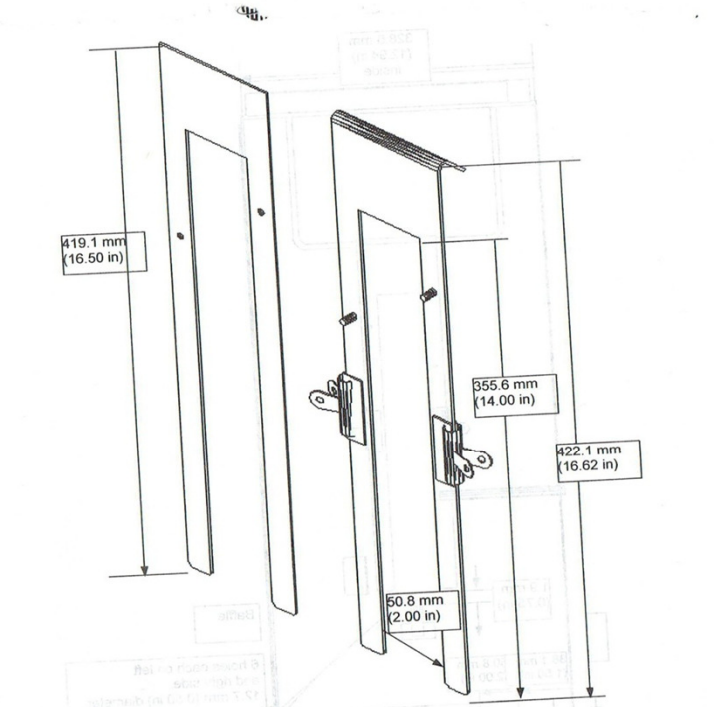


FIG. 5 Flame Height Indicator

Test Specimen and Sampling

- From each item in the laboratory sample (refer to 16CFR1615,1616 for sampling plan), cut 5 test specimens from the warp and filling directions in accordance with 16CFR 1615 or 1616. Fabrics used for children's sleepwear are tested in the final stage of processing and after 50 wash/dry cycles using AATCC Method 124 wash Table II Normal/Cotton Sturdy Table III and dry Table IV Durable Press

- Test specimens are cut to a length of 254 $\pm$ 3mm and 89 $\pm$ 3mm with the long dimension in the direction of the test.

Preconditioning and Conditioning

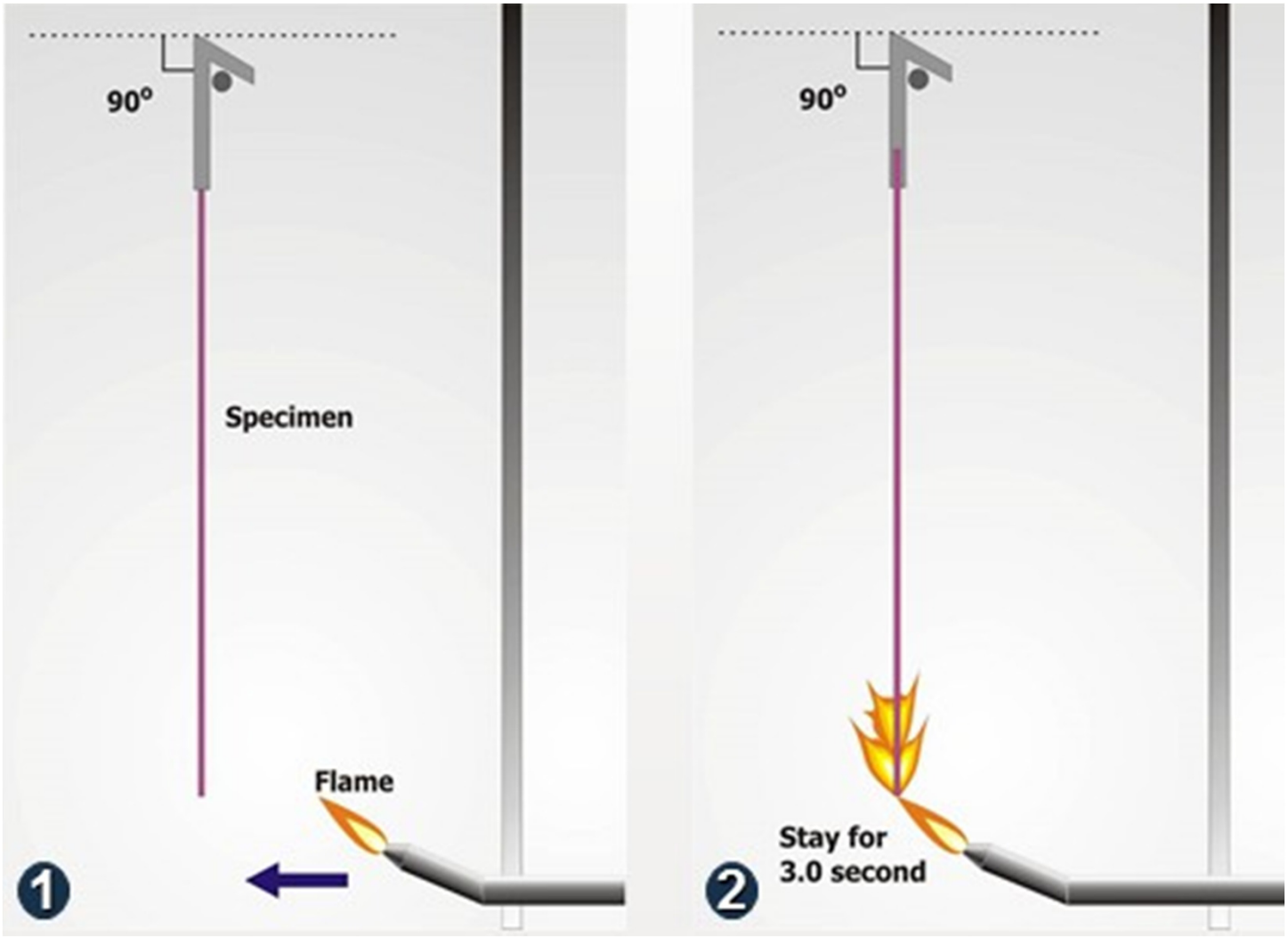
- Mount each specimen in a holder and clamp each side in at least 2 places
- Precondition the specimens at 20 ±2 C for a minimum of 4 hr. before conditioning
- Condition the specimen in a circulating oven at a temperature of 105 ± 2C for a minimum of 30 min. Remove and cool in a desiccator for 30-60min. Do not place more than 5 holders in a desiccator.

Procedure

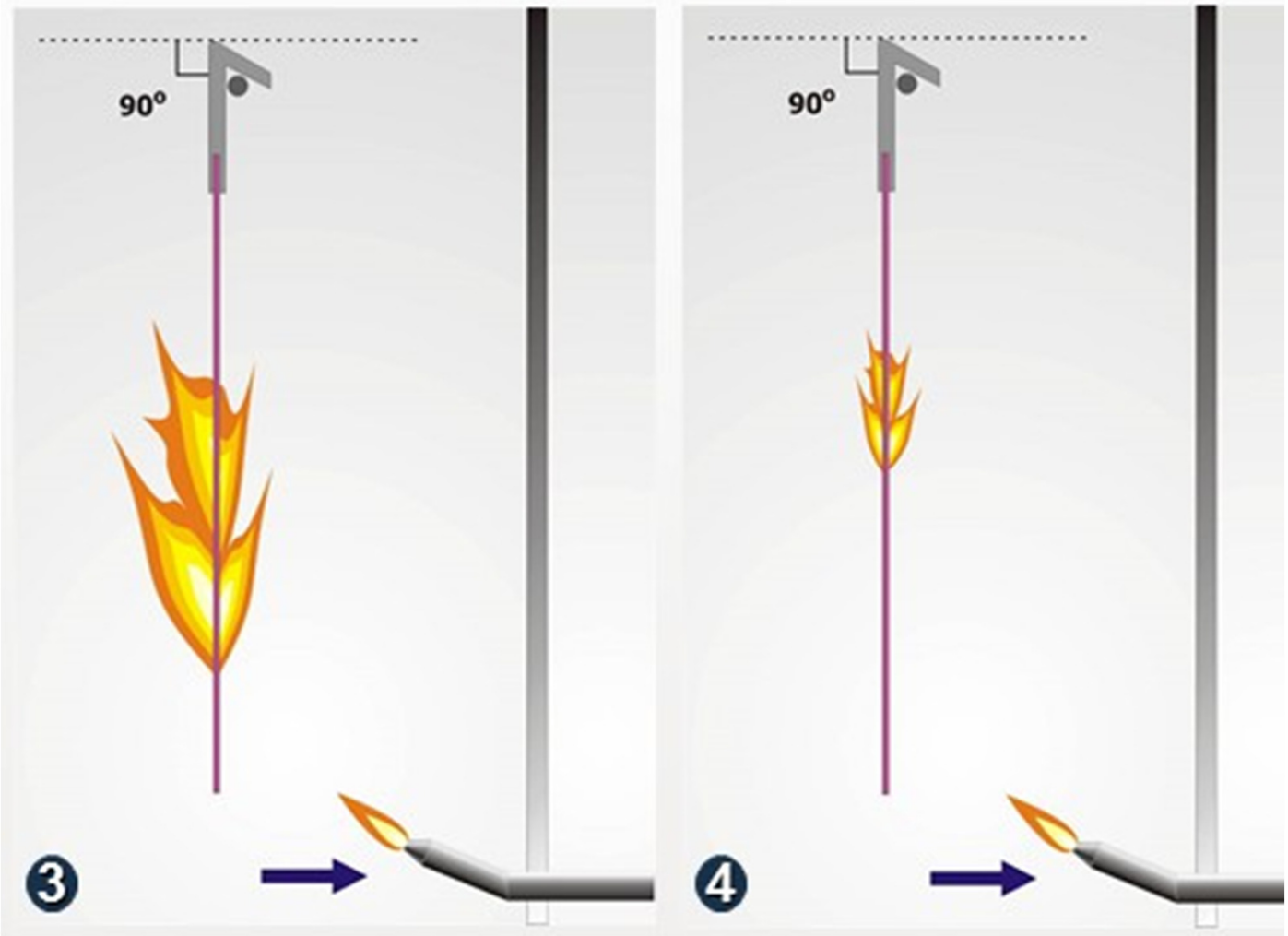
- With lab hood turned off, turn on the gas supply and using the valve adjust the flame height to 38 ± 2mm. If the chamber has a flame height indicator, it must be verified to 38±2mm and may be used to adjust flame height

- Remove one frame with specimen and mount on the specimen hanger, centered over the flame. Close the door and move the flame into place so that the bottom edge of the specimen is directly above the flame midpoint. Ignite the specimen within 30s of removing from desiccator. Expose the specimen to the flame for 3.0±0.2s and pull the flame away to terminate the exposure

Procedure



Procedure



Procedure

Procedure

- Observe and time the after flame and afterglow, recording the times
- Remove the specimen from the holder and crease it along a line through the peak of the charred area.
- Unfold the specimen and insert one hook with attached weight to one side of the charred area. Gently lift the specimen until the weight is suspended, causing the damaged area to tear.

Procedure

Using calibrated ruler, measure and record the char length as the distance from the tear edge to the edge of the specimen exposed to the flame

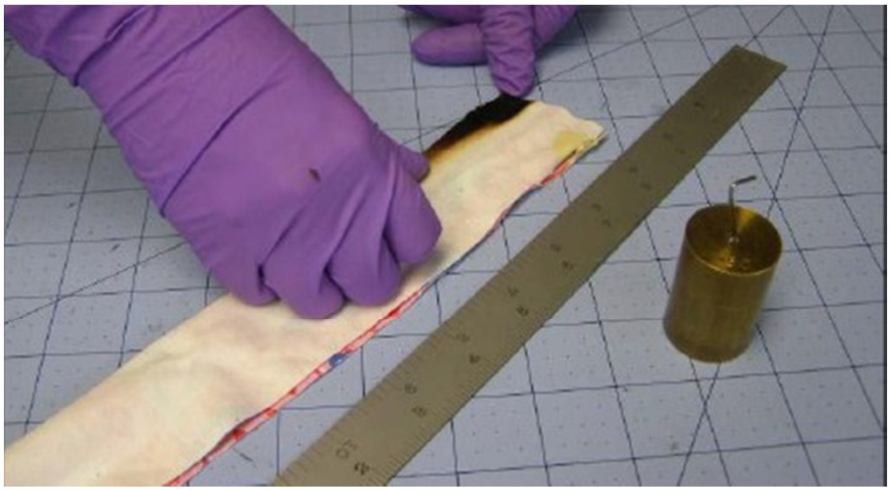


TABLE 1

Fabric Weight, g/m² (oz/yd²)		Loads, g (lb)	
Less than 101	less than 3	54.4 ± 0.5	0.12 ± 0.001
101 to 207	3 to 6	113.4 ± 0.5	0.25 ± 0.001
207 to 338	6 to 10	226.8 ± 1.0	0.50 ± 0.002
Greater than 338	greater than 10	340.2± 1.0	0.75 ± 0.002

Procedure

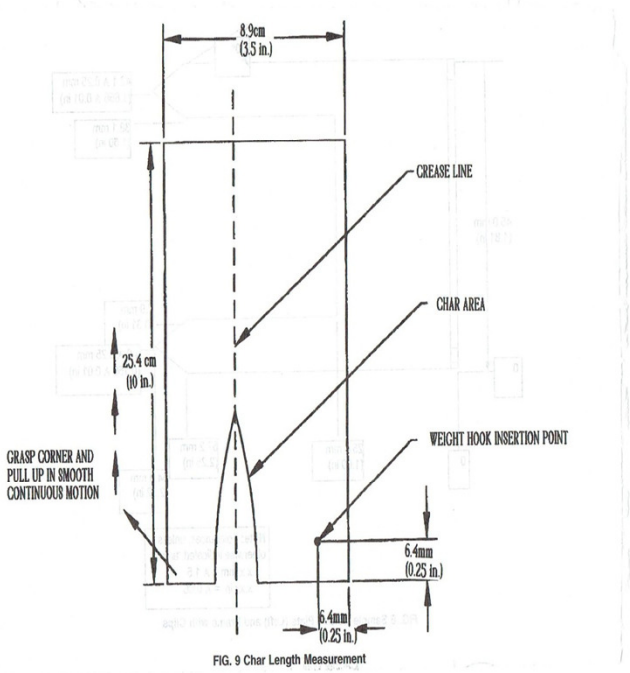
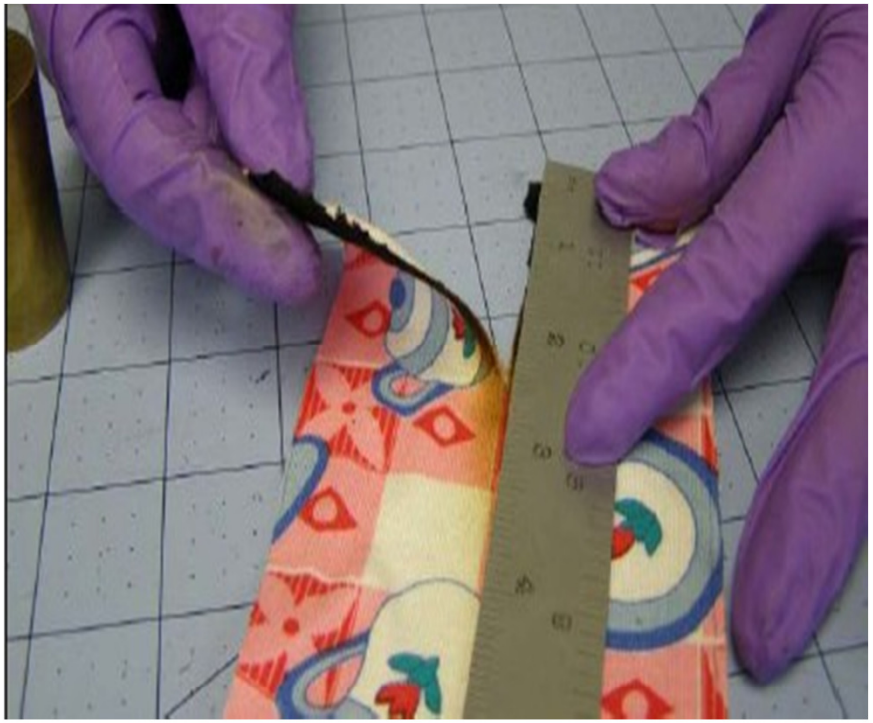


FIG. 9 Char Length Measurement



Report

- Report the date and time of test
- Report the name of test technician and responsible party
- Identification of product and manufacturer
- Condition of sample - as received or after laundering
- Report after flame time, afterglow time, char length for each specimen and the average of determinations

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Questions?

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Thank You!