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1 SCOPE

- 1.1 This method describes a procedure for performing the Sharp Edge Test on products or the components of products described in item 13 of Part II of Schedule I to the Hazardous Products Act (HPA) to determine if they meet the applicable requirements set out in the Hazardous Products (Toys) Regulations and to determine if the edges of products or the components are sharp and could cause injury to a child. Toys and other products that by reason of their functional purpose require an edge to be sharp are exempt. Since the numerical values of performance measures are based upon regulatory requirements, the tolerances for these values have been chosen such that no test parameter is applied to the product that results in a more severe condition than that specified in the regulation.

2 APPLICABLE DOCUMENTS


- 2.1 The Hazardous Products Act (HPA).
- 2.2 Hazardous Products (Toys) Regulations and other HPA regulations that include requirements for sharp edges.
- 2.2 PSL Project Report 2001: 0626: New Method: TEST PROCEDURES TO DETERMINE THE MECHANICAL HAZARDS - SHARP EDGES

3 SAMPLING

- 3.1 The following test procedure should be conducted on the number of specimens provided or received.

4 APPARATUS

- 4.1 A Sharp Edge Tester, model 8200 supplied by U.S. Testing Co., Inc. (see **Figure 1**), or other suitable test device yielding equivalent results and having the following equivalent specifications:
- i) Mandrel diameter - 9.35 ± 0.12 mm;
 - ii) Mandrel length - of suitable length to carry out test;
 - iii) Mandrel material - steel or other metallic material having a surface roughness of not greater than $0.4 \mu\text{m}$ and a hardness of 40 or more when measured on the Rockwell C Scale in accordance with ASTM standard E18-89a "Standard Test Methods for Rockwell Hardness and

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Rockwell Superficial Hardness of Metallic Materials" or latest edition;
and

- iv) Calibrated at a point 6.35 mm in from the end of the mandrel to ensure that the force with which the mandrel is applied to a test edge does not exceed 6 N.

4.2 An adhesive-backed polytetrafluoroethylene (PTFE) tape of which the thickness of the PTFE component is between 66 µm and 89 µm and the nominal thickness of the silicone polymer adhesive component is 80 µm; and

4.3 A caliper or other suitable measuring device with a precision of 0.05 mm.

5 TESTING PROCEDURE

5.1 **Table-top or bench-mounted sharp edge tester** (for edges difficult or impossible to test initially, use the hand-held sharp edge tester as a screening device. The product can be disassembled or broken down to facilitate testing and confirm edge sharpness with the table-top or bench-mounted sharp edge tester but only after all other required tests have been performed.

5.1.1 Identify and locate ridges or lines of intersecting surfaces on the product that are exposed, meet applicable accessibility requirements¹ and that may present a hazardous sharp edge. Note the restrictions or applicability of the testing procedure depending on the following material and product characteristics:


Plastic (toys): plastic edges that are suspected of being potentially hazardous sharp edges (except for the exemption mentioned in 1.1) that are exposed initially or prior to reasonably foreseeable use testing, and plastic edges that are exposed under the conditions of reasonably foreseeable use.

Plastic (non-toy articles): plastic edges that are exposed only upon initial visual and tactile examination.

Metal, wood and glass (all products): edges of which that are exposed only upon initial visual and tactile examination.


Cut edges of metal tubing (non-toy articles): edges of which that are unprotected and exposed upon

¹ Refer to pages M12-46 and M12-47 of the Test Method for Cribs and Cradles to determine accessibility of product occupants to sharp edges.

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initial visual and tactile examination, or cut edges of metal tubing that have become exposed when protective caps have been removed by a force of up to 90 N applied in any direction.

- 5.1.2 Wrap a single layer of test tape around the mandrel of the sharp edge tester so that one edge of the tape is aligned with the end of the mandrel. Ensure that the ends of the tape are not butted or overlapped by more than 2 mm.
- 5.1.3 Place the taped mandrel so that its axis is at $90 \pm 5^\circ$ to the line of the straight edge being tested, or $90 \pm 5^\circ$ to a tangent at the test point of a curved edge, and the tape is in contact with the edge when the mandrel is rotated.
- 5.1.4 Apply an upward force not greater than 6 N (1.35 lb force indicator line on the model 8200 housing) normal to the mandrel's axis and roll the mandrel 360° about its axis along the edge, ensuring that no relative motion occurs between the mandrel and the edge during the rotation of the mandrel (Note: if this causes the edge to bend, adjust the edge accordingly to maintain its contact with the taped mandrel).
- 5.1.5 Release the mandrel from the edge and carefully remove the test tape from the mandrel without enlarging any cuts in the tape or causing any score in the tape to become a cut.
- 5.1.6 Using a caliper or other suitable measuring device, measure the continuous length of tape that is cut completely through.
- 5.1.7 Repeat steps 5.1.2 to 5.1.6 for each area that was identified and located in step 5.1.1.
- 5.2 **Hand-held sharp edge tester** (used as a screening device only)
 - 5.2.1 Perform 5.1.1, 5.1.2 and position the taped mandrel with respect to the edge being tested as per the orientation described in 5.1.3.
 - 5.2.2 Press down on the handle of the tester such that the mandrel arm is approximately parallel with the upper edge of the tester's handle. Move the taped surface of the mandrel 50 mm along the edge under test, or at least the full length of the edge if less than 50 mm, and then back to its starting position without breaking contact with the edge.
 - 5.2.3 Perform 5.1.5 and 5.1.6.

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5.2.4 Repeat steps 5.2.1 to 5.2.3 for each area that was identified and located in step 5.1.1.

5.3 Results

5.3.1 Record the location of any sharp edge, whether they cut the Sharp Edge Test Tape and the length of the cut.

6 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

6.1 Ensure that all measuring instruments are functional and are calibrated with traceability to national or international standards.

6.2 Testing and the results obtained according to this method include uncertainty associated with the:

(i) uncertainty of any or all calibrations by an accredited calibration laboratory of the apparatus stated and used in this method,

(ii) standard uncertainty or standard deviation of a series of repeated measurements with the caliper or other suitable measuring device (documented in the Equipment Record binder),

(iii) a coverage factor ($k = 2$) to express an expanded uncertainty ($U = k u_c$, where u_c is the combined standard uncertainty) for a level of confidence of approximately 95%, assuming normal distribution (Reference: General Guidelines for Evaluating and Expressing the Uncertainty of Accredited Laboratories' Measurement Results, CLAS Reference Document 5, May 1999).

7 TEST REPORT


7.1 The test report should contain the following information:

7.1.1 A description of the product to include brand, style, country of origin, photo and UPC.

7.1.2 The number of sample elements tested.

7.1.3 The results of the tests (conducted in the sequence presented in section 5 of this test method) with specific details for any non-compliances or potential problems observed.

7.1.4 The analyst's name and signature, as well as the name(s) and signature(s) of the reviewer(s).

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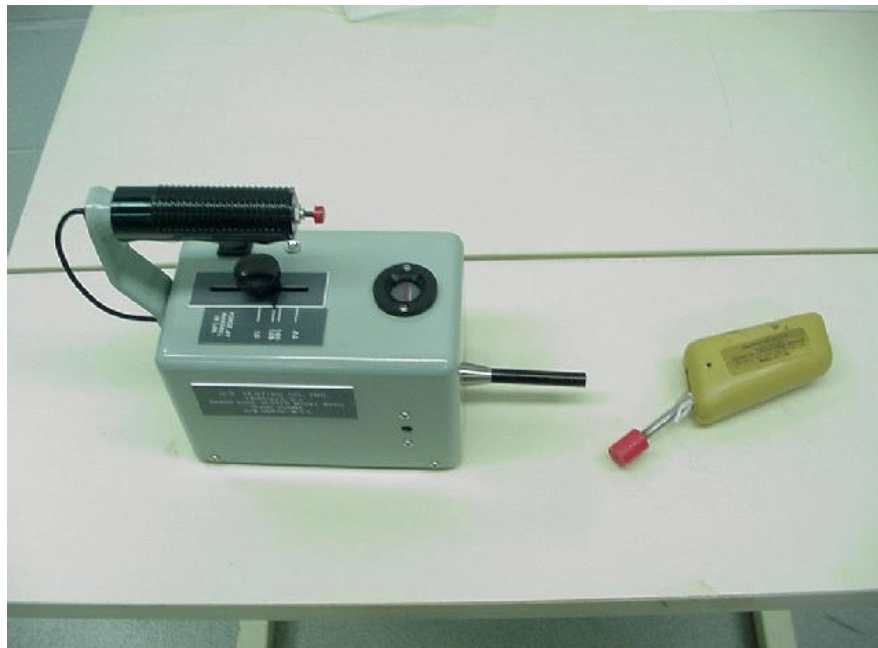


Figure 1: Typical sharp edge testers

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