INTERNATIONAL STANDARD

Measurement of Leather Softness IUP/36 (equivalent ISO method EN ISO 17235:2002)

FOREWARD: This method is an update of the original version published in 1994 and declared an official method of IULTCS in 1995.

(NOTE: This document is a true reproduction of the original International Standard IUP/36 - EN ISO 17235:2002)

1.0 SCOPE: This IULTCS Standard specifies a non-destructive method for determining the softness of leather. It is applicable to all light leathers.

2.0 NORMATIVE REFERENCES: The following standards contain provisions which through reference in the text constitute provisions of this IULTCS Standard: IUP/2 Sampling; IUP/3 Conditioning.

3.0 PRINCIPLE: A cylindrical rod of defined mass is lowered at a specified rate onto a securely clamped area of leather. The distension of the leather produced is recorded as the softness.

4.0 APPARATUS: *Note - The recommended apparatus for this method is the ST300 Leather Softness Tester, as manufactured by MSA Engineering Systems Limited, United Kingdom.*

4.1 Test machine, including the parts described in 4.1.1 to 4.1.7.

- 4.1.1 Circular aperture of diameter 35.00mm ± 0.1mm.
- 4.1.2 Metal rings, able to fit into aperture and reduce the diameter of the aperture to 25.0mm ± 0.1mm and 20.0mm ± 0.1mm respectively.
- 4.1.3 Clamps capable of holding the leather securely when the maximum force is applied and whilst leaving the portion over the aperture free to move.
- 4.1.4 Cylindrical load pin of diameter 4.9mm ± 0.1mm and length 11.5mm ± 0.1mm rigidly attached to cylindrical mass. The total mass of load pin and cylindrical mass shall be 530g ± 10g.
- 4.1.5 Means of guiding the load pin such that the load pin acts perpendicularly to the leather surface and the vertical travel of the load pin is restricted to a distance 11.5mm ± 0.1mm.
- 4.1.6 Means of lowering the load pin such that the load pin travels its full permitted distance of 11.5mm ± 0.1mm in 1.5 seconds ± 0.5 seconds.
- 4.1.7 Gauge, reading to 0.1mm, to directly measure the distension of the leather by the load pin.

4.2 Flat rigid metal disc of minimum diameter 60mm.

5.0 SAMPLING AND SAMPLE PREPARATION: Condition the leather in accordance with IUP/3. It will be possible to take measurements without physically cutting a sample from the hide or skin.

6.0 PROCEDURE:

6.1 Select the aperture from 35mm, 25mm or 20mm. *Note - It is suggested that the apertures are used as follows:*

- *35mm measurement of firmer leathers (e.g. shoe upper leathers)*
- *25mm measurement of leathers of moderate softness (e.g. upholstery leather, softer shoe uppers)*
- *20mm measurement of softer leathers (e.g. lightweight gloving and clothing leathers)*

6.2 Open the test machine and place the metal disc (4.2) over the circular aperture.

6.3 Raise the load pin and close the test machine to clamp the metal disc in position.

6.4 Release the load pin, allow the reading on the gauge to become steady and set to zero. Open the test machine and remove the metal disc.

6.5 Place the area of the leather defined in IUP/2 over the aperture ensuring that the leather lies flat, there are no obvious defects such as flay cuts or scar tissue over the aperture and that there is sufficient leather to allow effective clamping.

6.6 Raise the load pin and close the test machine to clamp the leather in position.

6.7 Release the load pin, allow the reading on the gauge to become steady and record the reading. Open the test machine and remove the leather.

6.8 Repeat 6.5 to 6.7 for other points in the area defined by IUP/2.

6.9 Repeat 6.5 to 6.8 for other areas of the hide or skin if required.

6.10 Repeat 6.5 to 6.9 for other apertures if required.

7.0 TEST REPORT: The test report shall include the following:

7.1 Reference to this IULTCS Standard.

7.2 The nominal aperture(s) used in the tests.

7.3 Identification of the areas tested and the individual and mean distensions recorded on the gauge for each aperture used.

7.4 Any deviations from the method.

7.5 Full details for identification of the sample.

INTERNATIONAL COMPARISON

A series of trials were set up by BLC Leather Technology Centre (BLC), Seton Leather (USA) and Toma A.S. (Czech Republic) to evaluate a number of available instruments for the objective measurement of leather softness. The instruments evaluated were as follows:

- ***ST300 Softness Tester***
- *GM9151P Pliability Test*
- *Shirley Stiffness Tester*
- *Tinius Olsen Softness Tester*
- *Toma Torsion Tester*

Each participant supplied a group of eight leathers which were assessed by the above methods before being passed on for further measurement. The leathers were randomly labelled 1 to 8 and ranked in accordance with the results of each test method. Manual hand gradings of each batch were made at Toma by 9 experienced leather workers, who were asked to rank each in order of softness. The rankings were then averaged and used as the benchmark to assess each instrumental technique.

CONCLUSIONS

*Throughout the trials it was noted that either the **ST300 Softness Tester** or Toma Torsion Tester correlated the best with manual assessments and, in all but one case, the **ST300** performed best. It is also the only non-destructive test method, so does not require samples to be removed from the leather for testing. This, therefore, means that evaluations are carried out much faster (triplicate results can be achieved in the order of 1-2 minutes), and the leather retains its full value. Measurements can be taken in any region across the skin or hide without causing damage.*

*The results obtained from these instruments are objective so any variation from test to test must be due to either intra-sample variation, or to operator error. By using a non-destructive test, the intra-sample variation can be minimised as results can be taken from exactly the same area test after test and, assuming the test itself doesn't overtly change the softness of the leather, similar values should be obtained. Also, one would assume that the more simple the test, the less likelihood there is of operator error. It is likely, therefore, that for these reasons the **ST300 Softness Tester** performed **BEST** in these trials.*

MSA

MSA ENGINEERING SYSTEMS LIMITED, 3 Assured Drive, Thurmaston, Leicester, LE4 8BB, United Kingdom
phone +44 (0)116 260 8866 | fax +44 (0)116 260 8861 | sales@msa-engineering.co.uk | **www.msa-engineering.co.uk**
Registered Office: 12 Shibden Hall Croft, Shibden Hall Road, Halifax, W. Yorkshire, HX3 9XF, UK | Registered No. 2636196 England