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**Leather - Physical and Mechanical Tests -
Determination of Bending Force**

皮革 物理和机械试验 弯折力的测定
(ISO 14087:2011, MOD)

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Table of Contents

Foreword.....	3
1 Scope.....	5
2 Normative References	5
3 Terms and Definitions	5
4 Principle	6
5 Apparatus.....	6
6 Sampling and Preparation of Specimen.....	9
7 Test Procedures	9
8 Representation of Results.....	10
9 Test Report	10

Leather - Physical and Mechanical Tests - Determination of Bending Force

1 Scope

This Standard specifies the test method for the bending force of leather.

This Standard is applicable to the determination of the bending force of various types of leather.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this document.

GB/T 39364 Leather - Chemical, Physical, Mechanical and Fastness Tests - Sampling Location (GB/T 39364-2020, ISO 2418:2017, MOD)

QB/T 2707 Leather - Physical and Mechanical Tests - Sample Preparation and Conditioning (QB/T 2707-2018, ISO 2419:2012, MOD)

QB/T 2709 Leather - Physical and Mechanical Tests - Determination of Thickness (QB/T 2709-2005, ISO 2589:2002, MOD)

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Bending force

The force that is exerted when the specimen is bent on the test rod at a certain bending angle (3.2), bending length (3.3) and bending rate (3.4).

3.2 Bending angle

The angle at which the bending force is measured.

3.3 Bending length

The total length of the specimen bending, that is, the distance between the specimen holding device and the force on the test rod.

3.4 Bending rate

The rate at which the specimen is bent.

NOTE: It is expressed in $^{\circ}/s$.

3.5 Compression bending

During the test, the grain or coating of the specimen is bent in a compression state.

3.6 Extension bending

During the test, the grain or coating of the sample is bent in an extension state.

4 Principle

The bending force is tested by the test rod method (two-point bending method). The specimen is clamped in a rotating device. During the rotation, the specimen exerts a certain pressure on the test rod, and the force is measured at a specific bending angle.

5 Apparatus

5.1 The bending force tester includes the following components:

- Clamping device, which can clamp the specimen vertically, the depth of the clamp is $(35\pm 1)\text{mm}$, the width of the clamp is $\geq 30\text{mm}$ (see Figure 1), and the specimen parallel to the clamp is evenly stressed. It may be moved steadily after fixing with a torque wrench. And the initial part of the specimen clamp does not touch the test rod.

6 Sampling and Preparation of Specimen

6.1 Sampling

It shall be performed according to the provisions of GB/T 39364. Sampling along the directions parallel to and perpendicular to the ridge line, respectively. If the ridge line cannot be distinguished, take samples in two directions perpendicular to each other, with no less than 3 samples in each direction. It can also be sampled at other angles (such as diagonal), which shall be indicated in the test report.

NOTE 1: If the extension bending and compressing bending of the sample need to be measured, another 3 specimens are taken in each sampling direction.

NOTE 2: If there are more than 2 samples in the same batch of products that need to be tested, at least one sample can be cut from each sample in each direction, and the total number of samples in each direction is no less than 3.

6.2 Preparation of specimen

The specimen size depends on the parameter setting (see 7.1). If specimens of other sizes are used, they shall be indicated in the test report.

6.3 Adjustment of specimen

It shall be performed according to the provisions of QB/T 2707.

7 Test Procedures

7.1 Determination of bending force

Fix the specimen in the clamp of the tester; and the length of the free end of the specimen shall comply with the provisions of Table 1. Use a torque wrench to tighten the clamp with a torque of 0.08N·m; and then set the parameters according to Table 1 and perform the test. When reaching the set initial pressure, the measured bending angle shall be 0°. Record the pressure value at the specific turning angle. Each specimen is tested only once, and the test shall not be repeated.

The test is divided into extension bending and compression bending. For extension bending, the direction in which the specimen is embedded in the clamping device shall be adjusted so that pressure is applied to the grain surface or the coating layer. For compression bending, the direction in which the specimen is embedded in the clamping device shall be adjusted so that pressure is applied to the meat surface or back layer.

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