



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 41424.1-2022

Leather - Determination of soiling - Part 1: Tumbling method

Issued on: April 15, 2022

Implemented on: November 1, 2022

Issued by: SAMR; SAC

Table of Contents

Foreword	3
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Principle	7
5 Reagents and materials	7
6 Instruments and equipment	7
7 Sampling and specimen preparation	10
8 Test steps	11
9 Result evaluation	13
10 Test report	13
Annex A (informative) Changes in the structure of this document compared to ISO 26082-2:2012	15
Annex B (informative) Technical differences between this document and ISO 26082-2:2012 and their reasons	17
Annex C (informative) Composition of synthetic grease	19

1 Scope

This document specifies a test method for the determination of the soiling properties of leather by the tumbling method.

This document applies to the determination of the soiling properties of various types of leather.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 250, Textiles - Tests for colour fastness - Grey scale for assessing change in colour (GB/T 250-2008, ISO 105-A02:1993, IDT)

GB/T 251, Textiles - Tests for colour fastness - Grey scale for assessing soiling (GB/T 251-2008, ISO 105-A03:1993, IDT)

GB/T 21196.1, Textiles - Determination of the abrasion resistance of fabrics by the Martindale method - Part 1: Martindale abrasion testing apparatus (GB/T 21196.1-2007, ISO12947-1:1998, MOD)

GB/T 32598, Textiles - Tests for colour fastness - Method for the instrumental assessment of soiling of adjacent fabrics (GB/T 32598-2016, ISO 105-A04:1989, MOD)

GB/T 33729, Textiles - Tests for colour fastness - Cotton rubbing cloth (GB/T 33729-2017, ISO 105-F09:2009, MOD)

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, ISO2419:2012, MOD)

3 Terms and definitions

There are no terms and definitions that need to be defined in this document.

4 Principle

Fix the leather specimen and standard cotton rubbing cloth on both ends of the drum, respectively. Add soiled felt. Rotate to make multiple collisions with the leather specimen. Determine the end point of the soiling test by evaluating the soil of a standard cotton rubbing cloth in the drum.

NOTE: The specimens can be pretreated by natural abrasion and flexural simulation tests during daily use before testing.

5.4 Petroleum ether (CAS number: 64742-48-9): Analytically pure.

5.5 Graphite milk: An aqueous dispersion with a graphite content of (18 $\pm$ 0.5)%, miscible with synthetic grease (5.1).

5.6 White wool felt: Wool content is $\geq$ 90%. Density is 0.30g/cm³~0.40g/cm³. Side length is (12.5 $\pm$ 0.5) mm. Need to prepare 160 pieces.

5.7 Cotton rubbing cloth: Desized, undyed, in line with GB/T 33729. Cut into a circle

with a diameter of (96 $\pm$ 1) mm. At least six pieces are required.

5.8 Gray sample card for evaluating soiling: In line with the provisions of GB/T 251, for white leather.

5.9 Gray sample card for assessing discoloration: In line with the provisions of GB/T

250 and is used for leather of other colors.

6.1 Drum soiling device (see Figure 1): The rotation speed is (24 ± 2) r/min. Change the

a diameter of (96 ± 1) mm and a rectangle with a size of about 50mmx55mm.

7.1 Sampling

Carry out sampling according to the provisions of GB/T 39364, or 50mm away from the edge of the sample. If the grain of the sample contains patterns, samples shall be taken at a representative grain pattern. Record sampling in detail in the test report.

7.2 Specimen preparation

Cut out 4 circular specimens with a diameter of (96 ± 1) mm from the leather for testing.

In addition, cut out 4 rectangular specimens with a size of about 50mm x 55mm, which are used as reference samples in the evaluation of results.

7.3 Specimen conditioning

Condition the specimen (7.2) and standard cotton rubbing cloth (5.7) according to the regulations of QB/T 2707. Tests are carried out in the standard atmosphere used for conditioning.

7.4.1 Finished leather

If necessary, the surface of the coated leather shall be pretreated before the test. The natural wear and flexure simulation tests of the specimens during daily use can be carried out as follows:

Install the sandpaper (5.10) and the specimen on the specimen holder and grinding table of the Martindale abrasion tester (6.5), respectively. Rub 100 times under 12kPa pressure. After rubbing, carry out 100,000 dry flexure tests in the folding endurance tester (6.4).

The bottom of the specimen shall not be exposed after the pretreatment. Otherwise, use sandpaper with a higher mesh or reduce the pressure of the abrasion test to re-treat the pretreatment. State it in the test report.

NOTE: If the specimen is pretreated, first cut a circular sample with a diameter of not less than 140mm from the leather. After rubbing treatment, cut it into square specimens with side length of (114 ± 2) mm. After folding, prepare the specimen according to the provisions

of 7.2.

7.4.2 Unfinished or lightly finished leather

Unfinished or lightly finished leather (such as aniline, suede) can usually be tested directly under standard conditions. For wear simulation pretreatment, use sandpaper with a higher mesh or conduct a wear test under reduced pressure. It is also possible to perform dry flexure directly in the folding endurance tester (6.4) without the abrasion operation. Record the pretreatment in detail in the test report.

8.1.1 Weigh (145 $\pm$ 0.5) g of synthetic grease (5.1). Put into a 1L beaker. Heat slowly in

a water bath until the grease melts.

8.1.2 Add 220mL of acetone (5.2), 220mL of butanone (5.3) and 25.0mL of petroleum

ether (5.4) to the beaker in turn. Dilute the grease.

8.1.3 Add (0.90 $\pm$ 0.01) mL of graphite milk (5.5) to the diluted oil solution. If the grease

solution solidifies, gently stir the solution and place in a water bath and heat slowly until melted. The filth shall be prepared and used immediately. It shall not be stored.

NOTE: The above solution is enough to soak 160 felts (5.6). To make more soiled felt, scale up each ingredient to make more soiling solution.

8.2.1 Immerse the felts in batches (20 or 40 pieces per batch) in the soiling solution (8.1)

for about 3min~5min. Remove and dry on a sieve. Repeat the operation until all 160 soiled felts are prepared.

8.2.2 Put the soiled felt in the oven (6.2) at (60 $\pm$ 2) degrees C and dry it for (3 $\pm$ 1)h. Remove and

cool to room temperature.

8.2.3 Place 160 soiled felts in 1 cylinder of the drum soiling device (6.1). The inside of

the cylinder is pre-cleaned with a solvent (such as acetone) and a cleaning cloth. Run the device for at least 16h. Disperse the soil evenly in the felt. Take out the soiled felt.