



STEERING WHEEL WEAR RUB TEST

Application

This procedure is used to determine the wear resistance of steering wheel materials.

Apparatus Required

Wear Rub Test Machine

The Wear Rub Machine (Figure 1) has a mounting position for whole steering wheels (Figure 2) as well as a fixture for mounting wheel wrap materials on a 25.4 mm diameter metal dowel (Figure 3). A motor with a rotating arm pulls a strip of cotton duck cloth back and forth across the sample similar to a shoe shine. A free weight attached to one end of the cloth provides the force. A counter will automatically turn off the machine after a preset number of cycles.

Source: Equipment is custom made, no specific manufacturer. Unit shown in Figure 1 was made at Ford Motor Company. Steering wheel manufacturers typically have similar machines.

#10 Cotton Duck Cloth: Style 426-ACT, 44.5 +/- 2 mm wide

Source: Test Fabrics Inc.
PO Box 26
West Pittston, PA 18643, US
PHONE: (570)603-0432
www.testfabrics.com

Purell Instant Hand Sanitizer – 65% Ethyl Alcohol (or equivalent)

Source: Johnson & Johnson Consumer Companies
PHONE: 1-800-223-0812
www.purell.com

Burette, 50 ml or larger

Or other device for dispensing water onto the cloth.

Sample Description

The following samples may be tested depending on the requirements in the Material Engineering Specification or for other investigations on wear performance.

1. 76 x 76 mm material sample for mounting on dowel
2. Steering wheel (Used to test painted urethane wheels or field returns)

Date	Action	Revisions	Rev. 0
2011 02 24	Active		



Conditioning and Test Conditions

All testing is based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing after sample receipt or after any preconditioning steps. Modifications of the test method must be noted in detail on the test report.

Procedure

1. Soak a length of 44.5 +/- 2 mm wide duck cloth in water until saturated.
2. Condition a 76 x 76 mm sample of material for 10 minutes in 55 +/- 1°C water. This step is omitted for steering wheels.
3. Remove and secure onto a 25.4 mm dowel. The sample may be held in place by clamps. The material should be held taught and stationary during the test. Steering wheels are mounted directly to the machine.
4. Position the duck cloth so it covers 180° of the sample without touching the seam. Weight the free end of the cloth with a 1.36 +/- 0.05 kg (3lb) mass and attach the other end to the reciprocating machine.
5. Ensure a smooth stroke with a length of 95 +/- 2 mm. One rise and fall of the weight equals one reciprocating stroke. The test shall run at 50 +/- 2 reciprocating strokes per minute.
6. Run the test for 1,500 reciprocating strokes in an ambient air temperature of 23 +/- 3°C.
7. Keep the cloth saturated with room temperature water to prevent the sample from overheating and to maintain a constant coefficient of friction.
8. Record number of cycles when wear becomes apparent. Suggest checking every 500 cycles.
9. Test a total of 3 specimens using a new cloth for each.

Procedure for Samples with Hand Sanitizer

1. Secure 76 x 76 mm material sample onto 25.4 mm dowel. The sample may be held in place by clamps. The material should be held taught and stationary during the test. Steering wheels may also be used in place of the material sample.
2. Weigh out approximately 3 grams of gel hand sanitizer and apply it to a plastic panel (Figure 4) to cover an area 44.5 mm wide and 200 mm in length as uniformly as possible. Work quickly to minimize evaporation of the sanitizer
3. Place the duck cloth on the plastic panel (Figure 5) so that the middle area of the cloth is over the hand sanitizer. Press the duck cloth into the sanitizer to saturate the cloth.
4. Position the cloth so it covers 180° of the sample without touching the seam. Weight the free end of the cloth with a 1.36 +/- 0.05 kg (3lb) mass and attach the other end to the reciprocating machine.
5. Ensure a smooth stroke with a length of 95 +/- 2 mm. One rise and fall of the weight equals one reciprocating stroke. The test shall run at 50 +/- 2 reciprocating strokes per minute.
6. Start the Wear Rub Machine within 1 to 2 minutes after saturating the cloth.

