

Road vehicles — Brake linings — Resistance to water, saline solution, oil and brake fluid — Test procedure

0 Introduction

In a variety of circumstances it is not unknown for automotive brake linings to become contaminated by water from rain, or salt from sea spray, or oil from axle seal failure or fluid from a wheel cylinder leak.

Such contamination could cause changes in mechanical strength and or physical shape of a brake lining and thereby reduce its functional capability.

1 Scope and field of application

This International Standard specifies a laboratory method for exposing samples to detrimental environments, measuring the effect on strength and shape and comparing the results with those from uncontaminated samples.

It applies to drum brake linings and disc brake pads being of organic content and intended for service on road vehicles.

2 References

ISO 611, *Braking of motor vehicle and their trailers — Terminology.*

ISO 1817, *Vulcanized rubbers — Resistance to liquids — Method of test.*

ISO 4926, *Road vehicles — Hydraulic brake systems — Non-petroleum base reference fluids.*

ISO 6311, *Road vehicles — Brake linings — Internal shear strength of lining materials — Test procedure.*

ISO 6312, *Road vehicles — Brake linings — Shear strength of disc brake pad and drum brake shoe assemblies — Test procedure.*

3 Definition

For the purpose of this International Standard, the following definition applies :

resistance : The ability to resist a change in thickness or shear strength due to contamination expressed as percentage of the figures for similar uncontaminated specimens.

4 Test apparatus

The test apparatus shall consist of :

- a) containers, for fluids and immersed samples;
- b) ball-ended micrometer, for measuring sample thickness;
- c) a material shear test rig, as described in ISO 6311 or ISO 6312.

5 Sampling and preparation

- Take at random, from the factory output, a minimum of fifteen representative linings or pads of nominally the same shape, size and material.
- Prepare samples in accordance with the requirements of ISO 6311 or ISO 6312, whichever appropriate for the samples.
- Mark all samples with a similar pattern of five selected spots for measurements of thickness.
- Mark each sample with a distinguishing identity.
- Measure and record the thickness to a tolerance of 0,01 mm at each spot on each sample, taking care not to indent the samples.
- Place the test samples at random into five groups of three and keep these groups apart.

1) At present at the stage of draft.

6 Test procedure

Test to be performed at ambient temperature, which should be noted.

In order to present a maximum surface to the active agents, the samples shall be stored in a vertical position during the contamination period, without touching each other.

6.1 Group I

Store the three samples in normal room atmosphere for 7 days. Measure and record thickness at each spot immediately prior to shearing.

Shear test all samples in accordance with ISO 6311 or ISO 6312 and record the figures.

6.2 Group II

Store the three samples in a bath of water for 7 days.

Remove from bath and dry surfaces with absorbent paper.

Measure and record thickness at each spot within 10 min of drying and immediately prior to shearing.

Shear test all samples in accordance with ISO 6311 or ISO 6312 and record the figures.

6.3 Group III

Immerse the three samples in a bath containing a solution of sodium chloride, 100 g/l, for 7 days.

Remove from the bath and dry the surfaces with absorbent paper.

Measure and record thickness at each spot within 10 min of drying and immediately prior to shearing.

Shear test all samples in accordance with ISO 6311 or ISO 6312 and record the figures.

6.4 Group IV

Immerse the three samples in a bath of lubricating oil, conforming to specification oil no. 2 in the annex of ISO 1817, for 48 h.

Remove from bath and dry surfaces with absorbent paper.

Measure and record thickness at each spot within 10 min of drying and immediately prior to shearing.

Shear test all samples in accordance with ISO 6311 or ISO 6312 and record the figures.

6.5 Group V

Immerse samples in a bath of brake fluid conforming to specification of compatibility fluid in ISO 4926, for 48 h.

Remove from bath and dry surfaces with absorbent paper.

Measure and record thickness at each spot within 10 min of drying and immediately prior to shearing.

Shear test all samples in accordance with ISO 6311 or ISO 6312 and record the figures.

7 Evaluation of results

— For each sample and at each stage of thickness measurement, average the five readings and record.

— Change of thickness by contamination is expressed as the difference in average thickness for each sample before and after contamination. The figures for the three samples may be averaged to give a figure for the product.

— Change of shear strength by contamination is expressed as the difference between the average of the contaminated samples and that for the uncontaminated samples. This may be given as a percentage of the average value for uncontaminated samples.