

Accelerated testing of wear and abrasion – but how? ABREX, Crockmeter, Martindale and Taber.

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The problem:

Plastic parts in the car interior such as steering wheel, door handle, gear lever or seat trim materials are subjected to wear from different effects. A.o., this may lead to undesired colour changes of coated parts or upholstery materials. Also, the marking of labels may become illegible.

Therefore, the initial approval testing of such parts also includes testing of wear and abrasion. If these tests are successfully passed, negative changes within the car lifetime are not to be expected. The detection of possible changes without long-running tests requires wear and abrasion testing in an accelerated mode. After testing, the worn samples need to be evaluated especially for optical changes.

The solution:

Because of the growing demand, the Analytik Service Obernburg has widened its testing scope for simulation of abrasion and wear. The following test instruments are available today:

Crockmeter:

The crockmeter allows the determination of the colour fastness of different materials (e.g. plastics, textiles, leather or carpets) against rubbing. This test is carried out according to DIN EN ISO 105-X12 onto which many common automotive test standards such as Daimler DBL 5404 or VW TL 226 are based.



In this test, a movable arm equipped with a rubbing fabric rubs with defined force and number of strokes over the fixed sample. The rubbing fabric can also be charged with media like water to simulate media effects this way.

ABREX:

The ABREX instrument is especially suited for determination of the abrasion resistance of a sample. This test is carried out according to DIN EN 60068-2-70 onto which common automotive standards such as BMW GS 97034-6 method A or Daimler DBL 7384 are based.

In this test, a standard fabric is cyclically moved via a silicone stamp (to simulate the human finger) over the surface of fixed flat sample at a defined speed and number of strokes. Similar to the crockmeter test, the influence of media (sweat, suntan lotion etc.) can be simulated using a liquid feed.



Industries (A-Z)

Automotive suppliers
Plastic processors
Textile

Objectives (A-Z)

Initial sample approval
Testing of wear and abrasion

Materials (A-Z)

Coated parts
Fabrics
Plastic parts

Analytical Methods (A-Z)

ABREX
Crockmeter
Martindale
Taber

Supplementary Methods

Colour measurement
Grey scale evaluation

Martindale:

The Martindale instrument is used to determine the scrub resistance especially of textile materials. This test is carried out according to DIN EN ISO 12947 onto which common automotive standards such as BMW GS 97034-6 method B or VW 50105 are based.



In this test, the fixed flat sample is exposed to a rubbing fabric under defined parameters (pressure, kind of movement, frequency, medium) over a defined period of time.

Taber:

The Taber instrument allows the determination of the wear resistance of coated surfaces. This test is carried out according to DIN EN ISO 5470 onto which common American or Japanese automotive standards such as GM GMW 14231 or Nissan NES M0141 are based.

In this test, the flat sample is mounted on a rotating disk onto which two friction wheels with defined load are placed. Different materials (rubber, abrasive grit, ceramics) can be used for the friction wheels. Then, the sample is exposed to a defined number of revolutions.



The evaluation:

In each case, the evaluation is carried out according to the instrument-specific standards, usually complemented by a grey scale evaluation according to DIN EN 20105-A02 and DIN EN 20105-A03.

The advantages:

The different wear and abrasion instruments allow the accelerated testing investigation of very different parts in a laboratory simulation test. By simultaneous adding of media, their effect on the abrasion and wear behaviour can also be studied. Based on the testing results, the aptness of the tested materials for use in the car interior can be assessed.

The Analytik Service Obernburg offers all wear and abrasion test described above, therefore also in this case a one-stop service from one source.

Interested?

The Automotive Testing Center of the Analytical Services Obernburg is ready to answer your questions and to help you.

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