

Contract Carpet Testing

All Bürofloor carpet tiles are classified as suitable for heavy contract use. But what does that mean?

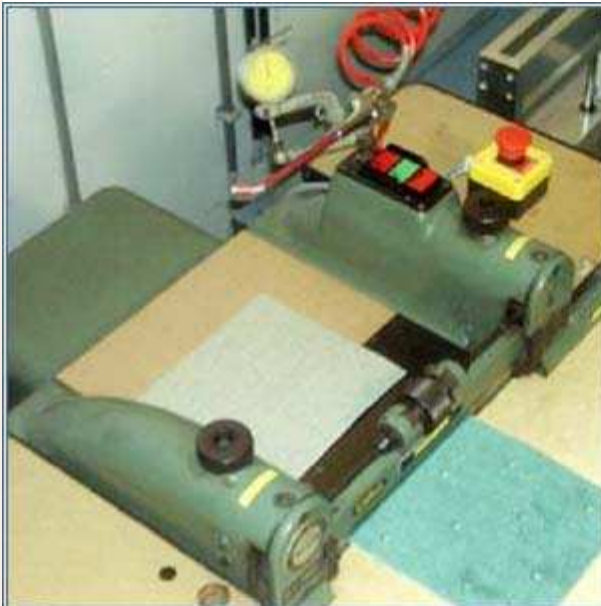
Contract carpets are subjected to a wide variety of tests to make sure they are strong and durable enough to withstand the rigours of heavy traffic day in, day out for many years. The information here gives an overview of the actual criteria that need to be satisfied for carpet to be recognised as a genuine heavy contract product.

You'll come across a wide variety of Euronorm (EN) tests and International Standards Organisation (ISO) tests on specification sheets and sample material of carpet. This overview is to help you to understand what is actually done to the carpet in each case.

Some of the tests are simple and intuitive, others are more unusual.

ISO 8543 – Effective Pile Weight

A simple test to start with – this test involves shaving the carpet down to its backing. It simply measures the mass of the pile removed in grams per square metre.



01.
Pile shearing apparatus

ISO 1765 – Total thickness

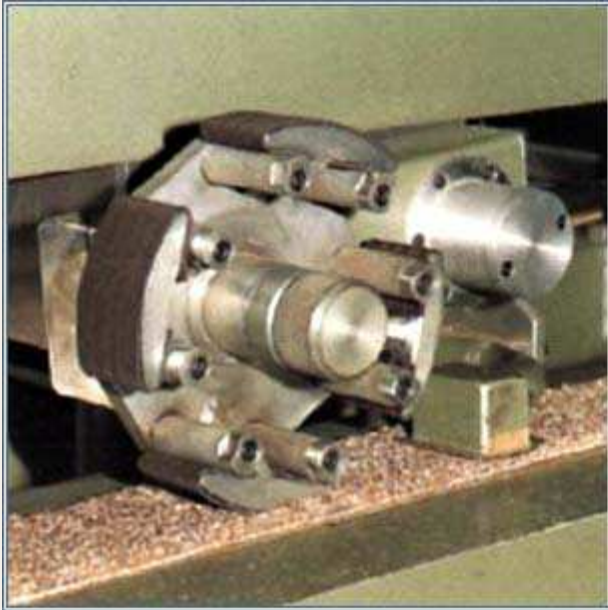
This is another relatively simple test. In this case the thickness of the carpet in mm is measured to the nearest 0.1mm



EN 1963 – Lison Treadwheel Test

This test measures the carpet's resistance to scuffing, in particular highlighting how strongly the pile tufts are secured. Typically, nylon pile (as used in Bürofloor tiles) significantly outperforms polypropylene, which is literally pulled apart by this test.

The treadwheel is positioned above the carpet to be tested and rolled to and fro across the sample 400 times. The wheel turns slightly faster than it moves across the carpet creating a severe scuffing effect. The tested carpet sample is compared to the master samples and is rated accordingly.



03.
Lisson treadwheel equipment

ISO 10361 – Accelerated Wear Testing

This standard is particularly relevant for carpet tiles that will be used in an office. It's composed of two tests, the Vetterman drum test and the castor chair test.

Vetterman Drum Test



04.
Vetterman drum test

In the Vetterman drum test the carpet for testing is placed inside a metal drum (shown above) which is specially designed to rotate. A metal ball with rubber knobbles is placed inside the drum and is

allowed to bounce around freely as the metal drum rotates, in effect simulating very heavy, focused foot. The metal ball weighs over 7.5 kg and the carpet is subjected to two tests, one of 5,000 rotations of the drum and one of 22,000 rotations.

The carpet is then visually judged against master wear samples and is given a rating for how well it has withstood the effects of the test.



The visual inspections of the carpet give results from 1 to 5 for both 5,000 and 22,000 rotations and the final result is a combination of the two results according to the formula below;

$$\text{Total Result} = 0.75 \times \text{Result after 5,000 rotations} + 0.25 \times \text{result after 22,000 rotations}$$

A result of 2 or more is a pass

A result of 2.4 or more is a pass for intensive use

Castor Chair Test

In the castor chair test, a chair with three castors carrying a weight of 90kg is rolled across the carpet to be tested first for 5,000 and then for 25,000 times to give two samples for inspection.

The tested samples are visually assessed against standard samples and are rated on a scale of 1-5 and the final result for the test is given according to the formula below;

$$\text{Total Result} = 0.75 \times \text{Result after 5,000 rotations} + 0.25 \times \text{result after 25,000 rotations}$$

The castor chair testing apparatus is illustrated below;



ISO/DIS 10965 – Electrical Resistance

This test is particularly important for contract carpet that could well find itself in computer rooms where a build up of static electricity could damage valuable equipment.

The carpet sample to be tested must be acclimatized for at least 7 days before the test at a temperature of 23+/-1°C and 25+/-2% relative humidity. This is because humidity impacts so greatly on conductivity of textiles and must be controlled rigorously to get a meaningful test.

In this test regime the horizontal resistance and vertical resistance of the carpet is measured (in Ohms).

Horizontal resistance: An isolating underlay is placed under the carpet tile sample which should be pile upward. 2 electrodes are

connected to the tile 200 mm apart and the resistance in Ohms is measured between them.

Vertical resistance: Here the electrodes are above and below the carpet tile and the resistance in Ohms is measured between them.

Measurements of less than 1010 Ohms are necessary for computer rooms.

The measuring apparatus is shown below;



ISO 3415 – Static Loading (Compression test)

This test is designed to see how much the carpet is compressed by a weight placed on it and replicates the effect of furniture on the carpet.



The thickness is measured before compression

A pressure of 220 kPa is applied for 15, 30 and 60 minutes.

The result is simply given in the loss of thickness in mm after a recovery period of 1 hour.

ISO 140-8 Acoustic Properties

The test equipment for this standard consists of two spaces, one above the other and 5 hammers, each of 500 gr. The first test is to measure impact absorption – i.e. how much impact noise is absorbed by the carpet sample.

First of all the hammers are allowed to free fall onto the floor of the upper space from a height of 4 cm, each striking the floor 10 times / second. The noise in decibels is recorded in the space below.

The test is then repeated with the addition of the sample carpet to the floor of the higher space.

The difference in decibels is the amount of impact noise that has been absorbed by the carpet sample. This test is interesting in that it shows how well carpet performs to stop noise transmission compared to other floorcoverings like wood or vinyl.

For ISO 354 the absorption of ambient noise is measured. Noise of different frequencies; (125 – 250 – 500 – 1000 – 2000) are broadcast down into a room of 200m³ and the amount of noise bounced back from the floor is measured. This is then compared with the noise reflected by the floor when covered with sample material. A result of 0.5 in this test shows that 50% of the noise that would have been reflected was absorbed by the test sample and that the remaining 50% was reflected by it.

ISO 2551 – Dimensional Stability and EN 986 for tiles

Carpet tiles must maintain their dimensions $\pm 0.02\%$ after the following treatments:

- Heating to a temperature of 60°C for 2 hours
- Bathing in water at a temperature of 20°C for 2 hours
- Further heating to a temperature of 60°C for 24 hours
- Conditioning in normal atmospheric conditions for 48 hours

These treatments demonstrate that the tiles will retain their integrity in the toughest conditions like hot water cleaning and extreme temperatures.



09.
Dimensional stability test