

Chemical Resistance Test Rubber samples



TS06-018

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Procedure for chemical resistance test

When a certain product or chemical is not mentioned in the chemical resistance list, a test can be carried out to determine the chemical compatibility of the hose materials*).

Test samples of the rubber compounds are available in the following shapes:



Square sample
NR, item: 28-900801



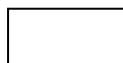
Square sample with cut-off corner
NR Endurance, item: 28-900810



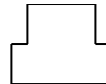
Round sample
NBR, item: 28-900802
F-NBR, item: 28-900808



Triangular sample
NBRX, item: 28-900804



Rectangular sample
EPDM, item: 28-900803



"Stair-shaped" sample
CSM, item: 28-900805

A rubber compound is made of approximately 50% of the base rubber material (NR, NBR, EPDM or CSM polymers). The other 50% are additives like carbon black and antioxidants. If the product reacts either with the additives or the rubber material, dynamic mechanical properties like hardness, tensile strength and elongation at break will change. Chemical attack can be measured by a change in hardness and/or swelling of the rubber compound.

Before the test is carried out the original hardness and dimensions of the test samples have to be measured. For the test, the test samples have to be submerged in the product for at least two weeks when this is done at ambient temperature. For a quicker and more reliable result, the product with the test sample can be heated up to 70 °C (160 °F)**) and be stored at this temperature for 7 days. The effect of a chemical reaction is then comparable with 3 months at ambient temperature.

After the test period the hardness and the dimensions of the test samples have to be measured again.

Hardness

The hardness of the compound has to be determined in the same way and at the same temperature as done before the test. An increase or decrease in hardness is an indication for chemical attack of the product towards the rubber compound. If the change in hardness is 5 Shore A or more, the use of the hose material is not advisable.

Dimensions

The test samples can swell in all three dimensions (length, width and height/thickness). A change in one of these dimensions of 5% or more is an indication of chemical attack. Then it is not advisable to use this hose material.

*) This test is static and not dynamic and is therefore only indicative. However it seldom occurs, it could be possible that the a rubber compound is tested to be compatible, but appears not to be in the dynamical pumping situation.

**) Take into account the physical properties of the product / chemical in such a way that no hazardous situation is formed. In such a case, the test can also be done at the process temperature with the samples submerged for two weeks.