

Elastomer technology



Questions arising during the daily work with elastomer materials can be several:

- What kind of material should be chosen?
- What substances must the material be able to withstand?
- In case of failure – what went wrong?
- Can it be done better?

FORCE Technology has many years of experience in consultancy and testing of elastomers and thermoplastic elastomers. These materials are used in e.g. O-rings, seals and medical packaging products and may be exposed to a wide variety of influencing factors such as mechanical loading or chemical exposure.

Through the years we have acquired many different test methods and techniques that enable us to analyse and test in a multitude of situations.

FORCE Technology has a wide experience with development projects as well as failure analyses of plastics and elastomers. We apply a range of different tests and techniques that enable us to carry out practical solutions.

Tests and analyses

Some of the most frequent methods used for testing and analysing elastomer materials are:

- Compression set
- Dimensions
- Hardness
- Mechanical properties
- Density
- Ozone durability
- Artificial weathering.

FT-IR analyses and analyses of elements are often used in conjunction with the determination of type of material.



Decomposed elastomer seal

Development

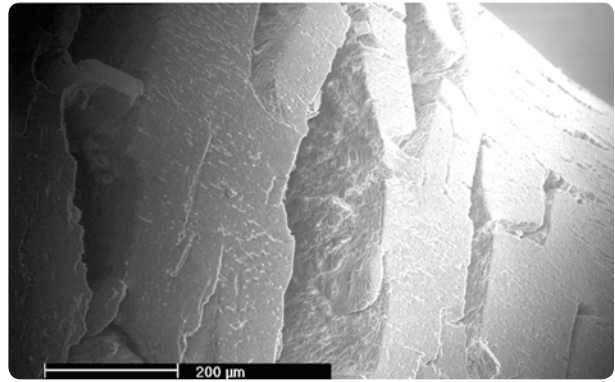
For many years FORCE Technology has assisted companies in developing new products. Usually the task is to find the optimal composition of the material for specified products, or it can be calculations to be used for optimisation. Often these tasks require widely different angles, and therefore creative thinking is necessary.

Case

A company wanted to have a potential elastomer coating examined; the coating would be exposed to various chemical substances. By use of Hansen's Solubility Parameters (HSP), the material was compared with the parameters of the actual chemicals. This comparison showed that only a few chemicals could be problematic. After a small number of tests the material could therefore be approved for the intended purpose.

Failure analysis

When a failure has occurred, the questions are plentiful and the answers often few. FORCE Technology can find the answer to what went wrong, and why, and as a natural result, we can assist you with advice on how to avoid failures in the future.



ESEM photo of cracks in elastomer

Cases

An EPDM seal in a food processing plant broke due to an inside leak. FORCE Technology examined the seal, and concluded that the sterilisation process led to a considerable absorption of water, and that fast cooling with cold water resulted in interior blisters and cracks that weakened the material. Based on this conclusion, FORCE Technology proposed a change in process in order to avoid fast cooling and thereby the creation of blisters and cracks in the seal. This solved the problem.

Another company suddenly faced problems with leaking seals. The company suspected the supplier of not having delivered the same quality of O-rings as previously, and the company chose a comparative study including testing of both new and old seals. The hardness of the seals was identical, but further examination showed that the density of the new ring was not within the range of tolerance. The company could then address its supplier. The consequence was that the supplier should document the quality of his future supplies to the company.

Research and development

FORCE Technology participates in a number of national and international research and development projects. Most of the development projects are carried out in collaboration with Danish and foreign companies and knowledge centres. The target is partly to promote technological development, and partly to maintain our employees' high level of knowledge for the benefit of our customers and collaborators.

Further information

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