



Permeation and fluid compatibility

Water and natural gas are two well-known fluids which are transported through polymer (reinforced) or flexible composite pipes with a proven suitability.

With the still expanding application range of polymer and flexible composite pipes the suitability of these materials in combination with specific chemicals or (renewable) gases is unknown and needs to be verified.

Consider for instance the chemical resistance of a material against specific sweet or sour environments or the permeation of gases through the pipe wall.

Permeation

At our laboratories we can perform various types of permeation tests on a wide scale of (semi-finished) products. For example, compression moulded foils or disks can be tested at a variety of dimensions. If a specific dimension is unavailable and required, we can make or adapt additional sample holders in our workshop.

We also have several test set-ups in our laboratory to measure the permeation of pipes or even complete pipe systems with joints, connections and/or other components. In this way, the permeation rate of the product itself is measured instead of a derivative. This is especially important for multi-layer systems such as reinforced thermoplastics (RTP) and flexible composite pipes (FCP).

Depending on the required gases, pressures and dimensions of the pipes the tests are performed in the laboratory or in specific containers with available test volumes up to 700 liter. All tests are based upon the most used ISO standards or Automotive regulations, which can be adjusted as required for your specific request.

Break-through times can be measured to calculate the diffusion coefficient. Once the steady-state region is reached, the permeation coefficient and thus the solubility can be calculated as well.

Testing can be done with gases (hydrogen, methane, carbon dioxide, hydrogen sulfide, et cetera), fluids (heptane, cyclohexane, et cetera) or even mixtures. Also testing of supercritical fluids or cryogenic gases are within reach. Our equipment is suitable to reach test pressures (well above) 100 bar. If required higher pressures and or other test gases can be arranged. More information is available on request.



In time test specimen can be taken out of the set-up to perform chemical analyses or mechanical tests in order to identify and quantify any aging effects.

Our workshop allows for precision manufacturing of test samples from moulded plates and pipes by using our milling machine. While all the chemical analyses and mechanical tests are done in our laboratory.



- Material compatibility testing on various materials
- Various sweet and sour liquids or synthetic condensates
- Pressures up to and well above 100 bar.
- All test samples can be made and tested in our laboratory.
- Custom made test set-ups can be made in our own workshop.

Fluid compatibility

To test the fluid compatibility of your material special test containers and cylinders of various dimensions are available. The material can be subjected to various fluids like all kind of sweet and sour liquids, but also different aliphatic or aromatic hydrocarbons like heptane, cyclohexane, et cetera. Fluids in the test containers can be subjected to test pressures up to and well above 100 bar while being held under adjustable temperatures.

Your materials or components being the tensile bars, rings of complete pipes can be subjected to deformations inside special cylinders capable of maintaining these high pressures.

Profile

Kiwa Technology is a world-leading expert on the field of polymer pipes testing, research and development. It has a well-equipped laboratory and experts to accurately, reliably and quickly test material properties.

At the same time our knowledge and expertise are available for advice and consultancy in analyzing failures, development of new products or systems or the testing of new material and system properties.

We can work with material pellets, sheets, pipes and even complete pipe systems including connections.

For more information or to discuss your ideas or challenges, please contact us by phone or email.

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