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Plastics Specific Testing

ARDL can perform many of its services on plastic as well as on rubber. The following tests are specific to plastic materials. Please see supplemental literature or ask about additional testing that can be performed if you don't find the testing you need listed here.

Compressive Properties of Rigid Plastic

Compressive properties include those such as compressive modulus, compressive strength and compressive failure strain.

Environmental Stress Cracking

Environmental Stress Cracking (ESC) is the formation of cracks in a plastic material caused by low tensile stress and environmental conditions. This failure is caused when plastic materials, in contact with surface active substances (stress cracking agents), start to become brittle at or about room temperature due to concurrent external and/or internal stress and strain action. Stress cracking agents include fluids such as alcohols, soaps, dyes and agents containing moisture. The amount of time in hours that it takes for half of the specimens tested to exhibit stress cracks is known as Environmental Stress-Cracking Resistance (ESCR). Cracks generally develop at the notch, perpendicular to the notch and run to the edge of the specimen; however, any cracks that develop constitute failure. Occasionally, cracks appear beneath the surface and are visible as surface depressions.

Flexural Modulus

Flexural modulus is the ratio of stress to strain in flexural deformation and indicates the stiffness of a plastic material when flexed. This test measures the force required to bend a plastic beam specimen under three-point loading conditions. The data is often used to select materials for parts that will support loads without flexing.

Fog Characteristics

Fog testing is a procedure performed in order to determine the tendency of interior materials to produce a light scattering film on a glass surface in a controlled environment.

Grinding of Plastic and TPE Materials

Grinding your plastic parts into granulated flakes allows for easier processing and injection molding of test specimens/plaques.

Rockwell Hardness

The Rockwell Hardness test measures hardness by indenting the test material with a diamond cone or hardened steel ball indenter. Hardness is measured on the R, L, M, E and K scales and is based on the increase of the depth of impression as load is applied. The higher the number on the scale, the harder the material.

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Plastics Specific Testing (cont.)

Heat Deflection Temperature

Heat deflection temperature is used to determine short-term heat resistance and is equivalent to the temperature at which a standard test bar deflects a specified distance under a load. It distinguishes between materials that are able to sustain light loads at high temperatures and those that lose their rigidity over a narrow temperature range.

Instrumented Impact

This test is designed to provide load versus deformation response of plastics under essentially multiaxial deformation conditions at impact velocities. It further provides a measure of the rate sensitivity of the material to impact.

Izod & Charpy Impact Testing

Izod/Charpy Impact measures a material's resistance to impact from a swinging pendulum by calculating the kinetic energy needed to initiate and maintain fracture until a specimen is broken. Izod/Charpy specimens can be tested unnotched or they can be notched to prevent deformation upon impact.

Injection Molding of Plastic and TPE Materials

Injection molding is a technique used to make parts from thermoplastic or thermosetting materials and involves molten plastic being injected into a mold at high pressure.

Injection Mold Shrinkage

After Injection Molding, molten plastic cools to form a solid which causes a decrease in volume. ARDL can measure the amount of Injection Mold Shrinkage your material will incur to help you to make better decisions about the dimensions of your product mold.

Melt Flow Rate

Melt Flow Rate measures the rate that thermoplastics flow through an orifice at a given load and temperature over a defined period of time.

Tear Properties of Plastic

Tear testing measures the ultimate force required to tear or initiate the tear of a plastic film or sheet.

Tensile Properties of Plastic

Tensile testing measures the force required to break a specimen and the extent to which the specimen stretches or elongates to that breaking point. Tensile tests produce a stress-strain diagram that is used to determine the tensile modulus. The data is often used to specify a material, to design a part that will withstand application force or to maintain quality control.

Vicat Softening Point

The Vicat Softening Point is used to predict the temperature at which a plastic material will soften when used in an elevated temperature application.

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