Pipe Test Equipment for PVC Pipes

According to EN 1401 | EN 1452

**IPT Test Equipment**
- Lab Test for PE Structured Wall Pipes
- Lab Test for PE Water Pipes
- Lab Test for PE Gas Pipes
- Lab Test for PEX-AL-PEX Pipes
- Lab Test for PP for Hot and Cold Water Pipes
- Lab Test for PVC Pipes
- Lab Test for PVC Windows Profiles

Institut für Prüftechnik
Competence creates Confidence. Since 1969.
Pipe Test Equipment for PVC Pipes

- **IptDataLogging®**
  - Bulk Density to ISO 60
    - Model No. 1132
  - Impact Resistance to EN 744/EN 1411
    - Model No. 1713
  - Pourability (Powder Flow Speed) to ISO 6186/ASTM D 1895
    - Model No. 1326

- **Specimen Milling Machine for Preparation of Test Bars**
  - Model No. 1643

- **Sieving Analysis**
  - Model No. H3001

- **Heat Reversion Test to ISO 2505**
  - Model No. H3014/1291

- **Internal Pressure Test to ISO 1167**
  - Model No. 1720/1751–1760

- **Congo Red Method to ISO 182**
  - Model No. H3012

- **Resistance to Dichloromethane to EN 580**
  - Model No. 1556

- **Vicat Softening Temperature to EN 727/ISO 306**
  - Model No. H3013

- **K-Value to ISO 1628**
  - Model No. H3008

- **Vicat Softening Temperature to EN 727/ISO 306**
  - Model No. H3013

- **Ring Stiffness to ISO 9969**
  - Model No. 1669/1663

- **Elongation at Break to ISO 527/ASTM D 638**
  - Model No. H3016

- **Sieving Analysis**
  - Model No. H3001

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How does one perform an efficient quality control of the quality control? Who counter-checks the test run if no-one is there or many tests are performed simultaneously?

In combination with IPT’s specialized software IptDataLogging®, you are in command of a test manager which continuously performs quality control, 24 hours, automatically monitors and records the ongoing procedures. The software supervises the correctness of the data throughout the complete test duration, constantly, reports, displays events and, if requested, forwards you the information per email or SMS. Due to this self-control and diagnostic, malfunctions can be recognized quickly and unnecessary costs caused by test repetitions can be minimized.

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<tr>
<th>Your benefits are</th>
<th>Performance characteristics 6.0</th>
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<tr>
<td>Automatic supervision</td>
<td>Comprehensive configuration possibilities</td>
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<tr>
<td>Decentralized control</td>
<td>Optimal sample management</td>
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<tr>
<td>Automatic documentation</td>
<td>Intuitive status management</td>
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<td>Random number of tests simultaneously</td>
<td>Variable database access as well as data export</td>
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<td>Full network capability</td>
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<td>Integration of non-IPT-equipment possible</td>
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<td>Improved Pipeson Integration</td>
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<td>Integrated Webserver</td>
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<td>(for the presentation of the tests via Tablet PC, or Smartphone)</td>
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Bulk density is defined as the weight per unit volume of material. A funnel is suspended above a measuring cylinder. The funnel is filled with a sample of the material which is allowed to freely flow into the measuring cylinder. The excess material on top of the measuring cylinder is scraped off with a straight edge. The sample and the cylinder is then weighed and the weight/volume (Bulk Density) is determined. Apparent density value is recorded as g/cm³.

The Bulk Factor may be calculated by dividing the average density of the moulded or formed specimen by the average apparent density.
Poor pouring properties can cause material to clog the funnels of the production machines and that can result to fluctuations in the quality of the final products or even standstills in production. For this reason it is important to ensure that the flow properties of material supplies are determined at the time delivery. The test result is expressed as the flow time in seconds.

More than 40 years experience. Our strength lies in our versatility, problem solving, quality and competitiveness. We invite you to share in our successful 40 traditional years of service.

For more information go to www.iptnet.de
By means of the Vicat Test, measurement of a plastic’s softening temperature are made. The flattened end of a round needle with a surface area of 1 mm² is pressed (with predetermined force and at steadily increasing ambient temperature in an oil bath) into the sample. The test is terminated when the needle penetrates into the sample by 1 mm.

Practicable alternatives are:
- Method A with an applied force of 10 N
- Method B with an applied force of 50 N

In each case the temperature can be raised by 50 °C or by 120 °C per hour. The test conditions are called A50, A120, B50 or B120.
During the production process it is essential to control the quality of PVC pipes and profiles by determining whether the plastification of material is adequate or in other words to check the gelation in rigid PVC Pipes. The standard specifies a method for determining the resistance of unplasticized poly (vinyl chloride – PVC-U) pipes to dichloromethane at a specified temperature (DCMT). The method can be used as a rapid means of quality control during manufacture. The requirement to be fulfilled is no attack at any part of the surface of the test piece of at least 30 min at the temperature of 15 °C.
Heat Reversion Test to
ISO 2505
Model No. H3014/1291

During this test, the samples are placed in an oven with hot air circulation of (110 ± 2 °C) for at least 60 min (depending upon the wall thickness of the pipe) and then the decrease of the sample length as compared to the original length is calculated. Following the thermal exposure and after cooling down, the length of pipe sample will become shorter. This could lead to the change in roundness of the installed pipes.

Therefore, having completed the test, the standard limit of linear changes (approximately up to 3 %) will be studied in the laboratory. The pipe shall show no delamination, cracks or bubbles.

For more information go to www.iptnet.de
The major test which can assure the pipes lifetime is the hydrostatic pressure test. The test is used to examine a polymer creep behaviour and is the basis on which the pressure rating, required dimensions or anticipated service life of pipes (over 50 years) can be determined.

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The impact properties of the polymeric materials are directly related to the overall toughness of the material. Toughness is defined as the ability of the polymer to absorb applied energy.

The area under the stress-strain curve is directly proportional to the toughness of a material. The impact resistance of PVC pipes is important especially at low working temperatures. **The impact resistance is determined by 2 methods, staircase and round-the-clock.** For the Staircase-method the failure energy is determined and Round-the-clock method is an examination around the circumference of the pipe against the impact resistance.

For more information go to www.iptnet.de
The principle of the method specified is vertically compressing a length of pipe supported horizontally between two parallel flat plates moved at a constant speed which is dependent upon the diameter of the pipe, measuring the force and the deflection, plotting the force versus deflection, and calculating the ring stiffness as a function of the force necessary to produce a deflection of 0.03 nominal diameter diametrically across the pipe. Applies to pipes having a circular cross-section.

For more information go to www.iptnet.de
Elongation at Break to ISO 527/ASTM D 638
Model No. H3016

Tensile tests measure the force required to failure of a specimen and the extent to which the specimen stretches or elongates to that breaking point. Tensile tests produce a stress-strain diagram, which is used to determine tensile modulus. The data is often used to specify a material, to design parts to withstand application force and as a quality control check of materials. Specimens are placed in the grips of the tensile machine at a specified grip separation and pulled until failure. For ASTM D 638 the test speed is determined by the material specification. For ISO 527 the test speed is typically 5 or 50 mm/ min for measuring strength and elongation and 1 mm/ min for measuring the tensile modulus. An extensometer is used to determine elongation and tensile modulus.

For more information go to www.iptnet.de
Specimen Milling Machine for Preparation of Test Bars
Model No. 1643

The IPT CNC-controlled unit has been specifically developed to meet the requirements of plastic pipe manufacturers, and is capable of accommodating test bars up to 70/120 mm thickness. Customized test specimen according to various standards such as EN, ISO, ASTM, etc. are available upon request.

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Congo Red Method to ISO 182
Model No. H3012

Intended primarily as a simple and rapid quality-control test during the manufacture and conversion of PVC compounds.

Suitable for coloured compounds. The determination is carried out on a sample of the PVC compound which is maintained at an defined temperature in still air until the colour of a Congo red paper held above it changes from red to blue. If universal indicator paper is used, the colour change is that corresponding to pH 3. The time required for the colour change is taken to be the stability time, ts.
The K-Value, a dimensionless parameter derived from measurements of solution viscosity, is used for the approximate determination of the molecular weight of a polymer. It is extrapolated from series of measurements of the time needed for polymer solutions, of varying concentration, to flow through the capillary tube of a so-called viscosimeter. With the automated viscosity measuring unit the measurement is made simple and easy.

This method is the most accurate measurement of the viscosity of Newtonian liquids.
Sieving Analysis
Model No. H3001

Sieve analysis is used to determine the distribution of grain or particle sizes, and to find the proportions by weight of different particle size ranges.

Each category is determined by two consecutive sieve mesh sizes. Materials used in moulding are analysed with the help of machines which contain sieves positioned above each other. These swing back and forth horizontally. According to various standards, sieve-mesh sizes are classified by number. In processing PVC-U, sieve analysis of the pure PVC powder is a powerful tool in maintaining the constant quality of the required PVC-U formula.

For more information go to www.iptnet.de