



Machine design

The HPE Triaxial Piston Cylinder Press is designed specifically for high-pressure / high-temperature testing with torsion on Sigma-1 piston. The press has 2300T in press force, which can be split between the end-load, and the cell process pressure. The Sigma-1 pressure has a maximum of 200 tons, and 600 tons for the cell process pressure, thus leaving 1500 tons for the end-load.

The cooling system is integrated into the HPE press. That way, there is no need to provide temperature control features inside the vessel. That means that the more frequently exchanged part of the machine (i.e. the tooling) can be kept as simple and cost-effective as possible. The high-pressure vessel itself is placed on a sliding table, which offers an easy and safe setup of the high-pressure experiment outside of the press, and a safe and easy alignment of the vessel inside the press.

Examples of HPE systems:

Process pressure of 3 GPa can principally be achieved with $\varnothing 50$ mm bore size, and
Process pressure of 2 GPa can principally be achieved with $\varnothing 60$ mm bore size.

Up to 1500°C heating of bore sample, controlled with needed ramp up/down curve and monitored with thermo-couple readout. Temperature curve, press cycle, and Sigma-1 data can be collected in a log file.

Use in Industry

The press frame is stripwound, and the press is equipped with a pneumatic-hydraulic power pack solution. This unique machine design offers a strong, compact, safe, quiet, cost-effective, and easy to operate press equipment. The low energy consumption furthermore ensures an environmentally friendly press system. To ensure correct test conditions of the high-pressure cell, the control panel provides easy reading, adjustment, and data log of the applied pressure and temperature of the test cell.

The overall equipment dimensions for a HPE 2300T press are W1500 x D1050 x H3200 mm. The electrical cabinet and hydraulic powerpack are placed near the press. The total press weight including the high-pressure tooling is 9000-10000 kg.

The press is built to order and based on a mutually approved equipment specification. Normally a HPE equipment project would include the press and the high-pressure tooling.



The HPE Press installed in an equipment pit



The HP vessel positioned in the press on a sliding table



HP vessel with quick-connecting external cooling rings