



### Machine design

# HPE Triaxial Piston Cylinder Press

The HPE Triaxial Piston Cylinder Press is designed specifically for high-pressure / high-temperature testing with torsion on Sigma-1 piston.

The press has 2.300T in press force, which can be split between the endload, 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 endload.

The cooling system is integrated into the HPE press and provides a simple and cost-effective separation of the press equipment from the high-pressure tooling. 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.

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. To ensure correct test conditions of the high-pressure cell, the controls panel provides an easy reading, adjustment, and data log of the applied pressure and temperature of the test cell.

The overall equipment dimensions for a HPE 2.300T press are W1500 x D1050 x H3200 mm. The electrical cabinet and hydraulic powerpack are placed nearby the press. The total press weight including the high-pressure tooling is 9.000-10.000 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 cooling rings*