

182 GDS Helpsheet

Hardware

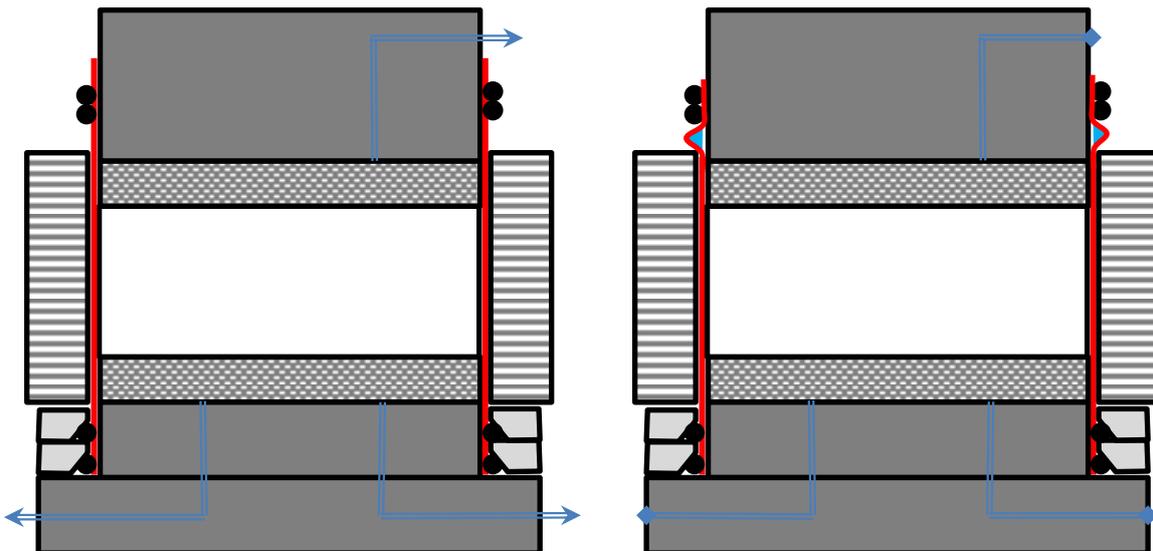
Simple Shear Tests

Measuring Pore Pressure in a Simple Shear Test

The simple shear test as performed by the EMDCSS (Electro Mechanical Dynamic Cyclic Simple Shear) and Static Simple Shear Box is designed to be run in accordance with ASTM D-6528. This is a test with drained conditions (open to atmospheric pressure) and constant volume (by active control of fixed height and constant area by use of confining rings). In this test it is assumed that any drop off in observed axial load is equivalent to an in-situ increase in pore water pressure.

Direct measurement of pore water pressure requires an un-drained setup, where the sample is held under effective stress rather than by volumetric confinement. GDS offer pressurised shearboxes which can be used for these tests such as the ADVDCSS (Combined Advanced Dynamic Cyclic Simple Shear). In such a test the sample may be laterally confined by pressure or a combination of pressure and confining rings.

While it is possible to fit a pressure transducer to one of the drainage lines on a standard simple shear system, some judgement has to be used regarding the quality of the data this will produce. Firstly is the issue of how to saturate the sample when only a small stress could be used – this can to some degree be overcome by using a slightly negative back pressure. The next issue is that of “ballooning” of the membrane if pressures above atmospheric are reached. This effect can be seen in the diagrammatic cross section on the right below.



GDS are happy to provide transducers and aid in setting up a system with this configuration but wish to point out the possible limitations of using such a configuration. For further assistance or clarifications on this setup please contact our support team on support@gdsinstruments.com.