

90 GDS Helpsheet



*World Leaders in Computer Controlled Testing
Systems for Geotechnical Engineers and Geologists*

Hardware

Triaxial Testing Systems

Procedures for Unsaturated Testing

1. Automatic Production of Soil-Water Characteristic Curve

To create the soil-water characteristic curve the four dimensional stress path facility is used. The test is carried out with a fixed cell pressure and a small fixed deviator stress. A series of pore water pressures and pore air pressures are pre-programmed in. A plot of pore water volume change against time is used to determine the termination of each stage. Typical co-ordinates could be as follows

Cell Pressure	Deviator Stress	Pore Air Pressure	Pore Water Pressure
1200	10	1160	1150
1200	10	1160	1050
1200	10	1160	950
1200	10	1160	850
1200	10	1160	750
1200	10	1160	650
1200	10	1160	550
1200	10	1160	450
1200	10	1160	350
1200	10	1160	250
1200	10	1160	150
1200	10	1160	50

The period of time between co-ordinate points should be set from a knowledge of the material to be longer than necessary. By viewing the shape of the curve of say pore water volume change against time a decision can be made when an equilibrium state has been reached, i.e . At this stage the F2 function key can be pressed to move the system on to the next stage of the test.

2. Setting a Degree of Saturation

This can be achieved in two stages. The first stage is to prepare the soil water characteristic curve for the soil. Then starting from a saturated condition the required pore air pressure and pore water pressure values can be set to give the required degree of saturation.

3. Preparing a Test Specimen for Unsaturated Testing

The starting position for all unsaturated testing is a 100% saturated test specimen. This is achieved in the normal fashion with the valve to the pore air connection closed. When the required 'B' value has been achieved which indicates full saturation the system can then be run in the unsaturated mode. Before opening the valve to the pore air pressure source you must be careful to ensure that the pore air pressure is close to the pore water pressure but at least 10 kPa higher than the pore water pressure.

Points to note in all circumstances are:

- Cell pressure must be higher than pore air pressure and pore water pressure.
- Pore air pressure must be higher than pore water pressure.
- The difference between pore air pressure and pore water pressure must not exceed the air entry value of the high air entry porous stone in the base pedestal.
- The high air entry porous stone will only maintain a higher air pressure than water pressure while the stone is saturated.