

76 Helpsheet

Hardware –

Bishop & Wesley Cell –

Maximum Force and Pressure

Overview

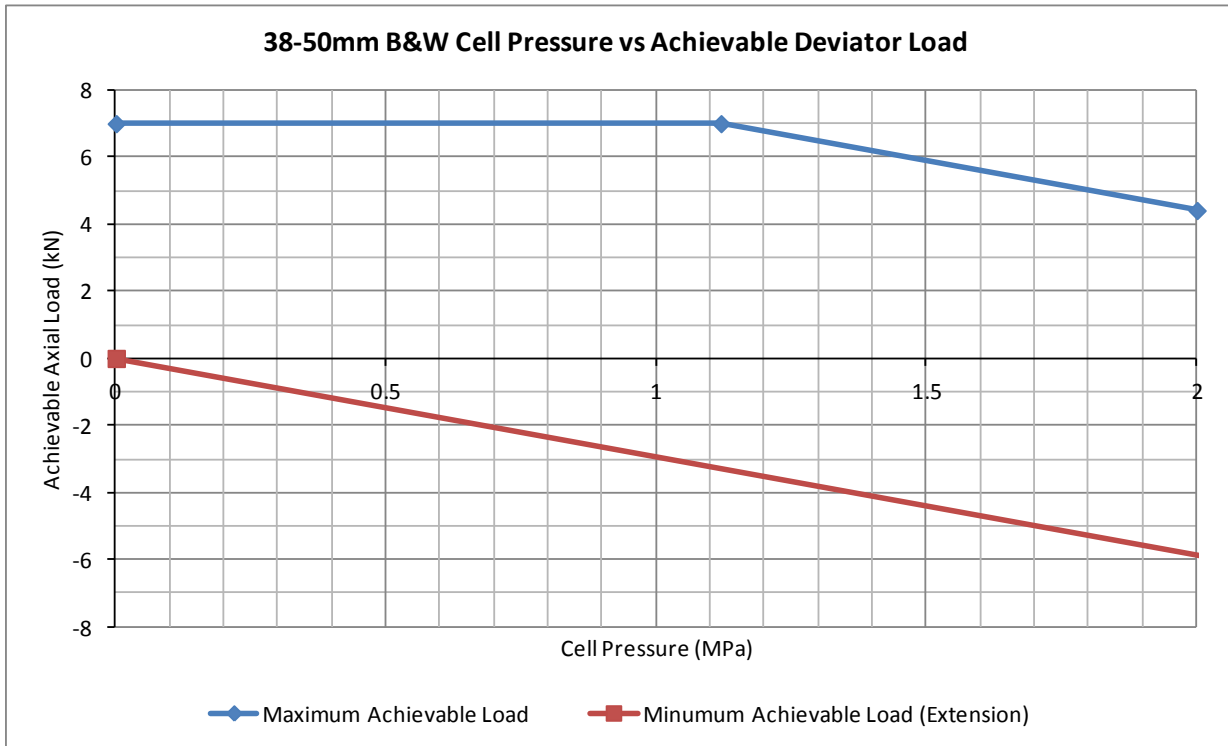
Bishop & Wesley stress path cells use a pair of Bellofram rolling diaphragms to transmit pressures from the lower chamber into the cell (and thus sample). These diaphragms, the chambers they are fitted into and the cell tops, each have a maximum safe working pressure (SWP). This combination of safe working pressures means that there is an allowable pressure and thus deviator force envelope within which tests must be carried out when using B&W Cells.

B&W Quick Reference Table

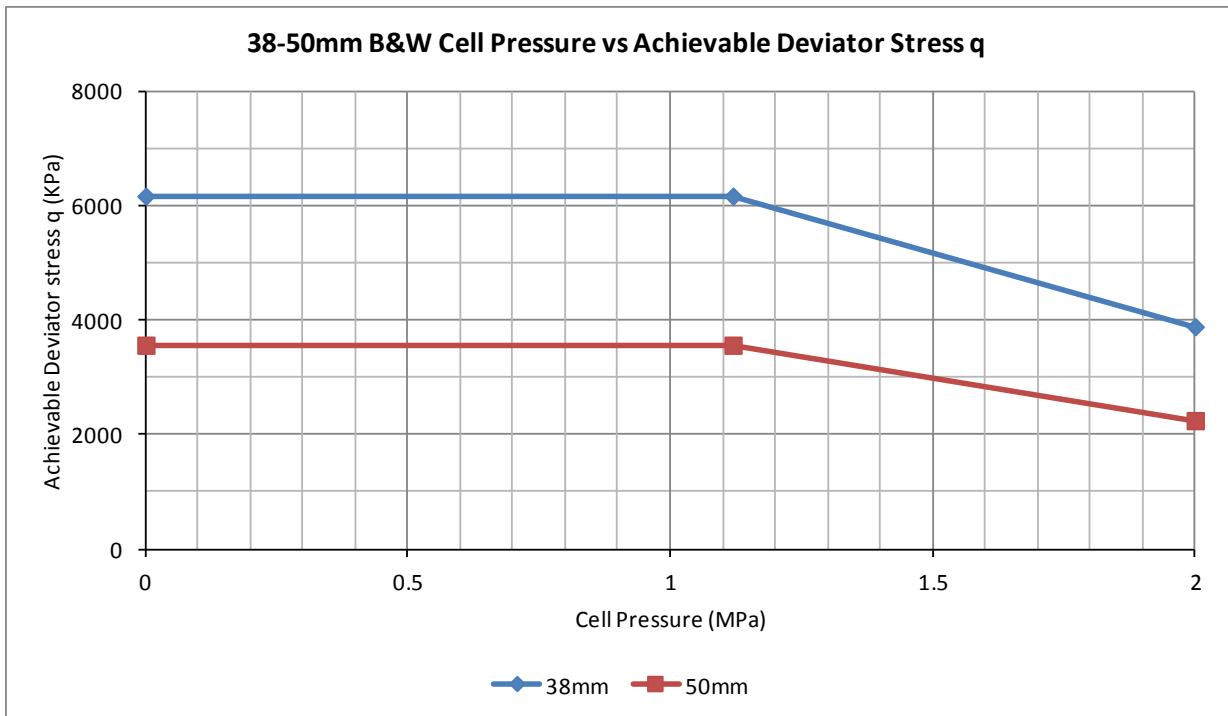
The table below is an overview of the key parameters for comparison between 38-50 and 70-100mm Bishop & Wesley systems.

	38-50mm Cell	70-100mm Cell
Max deviator load	7kN	25kN
Bellofram area	2940mm ²	20587mm ²
Nominal travel	25mm	50mm
Max Cell Pressure (CP)	2000kPa	2000kPa
Max Lower Chamber (LC) Pressure	3500kPa	2500kPa
Max difference LC-CP	2400kPa	1250kPa
Max achievable CP at full load	1100kPa	1300kPa
Max achievable load at full CP	4.4kN	10.3kN

38-50mm Cell

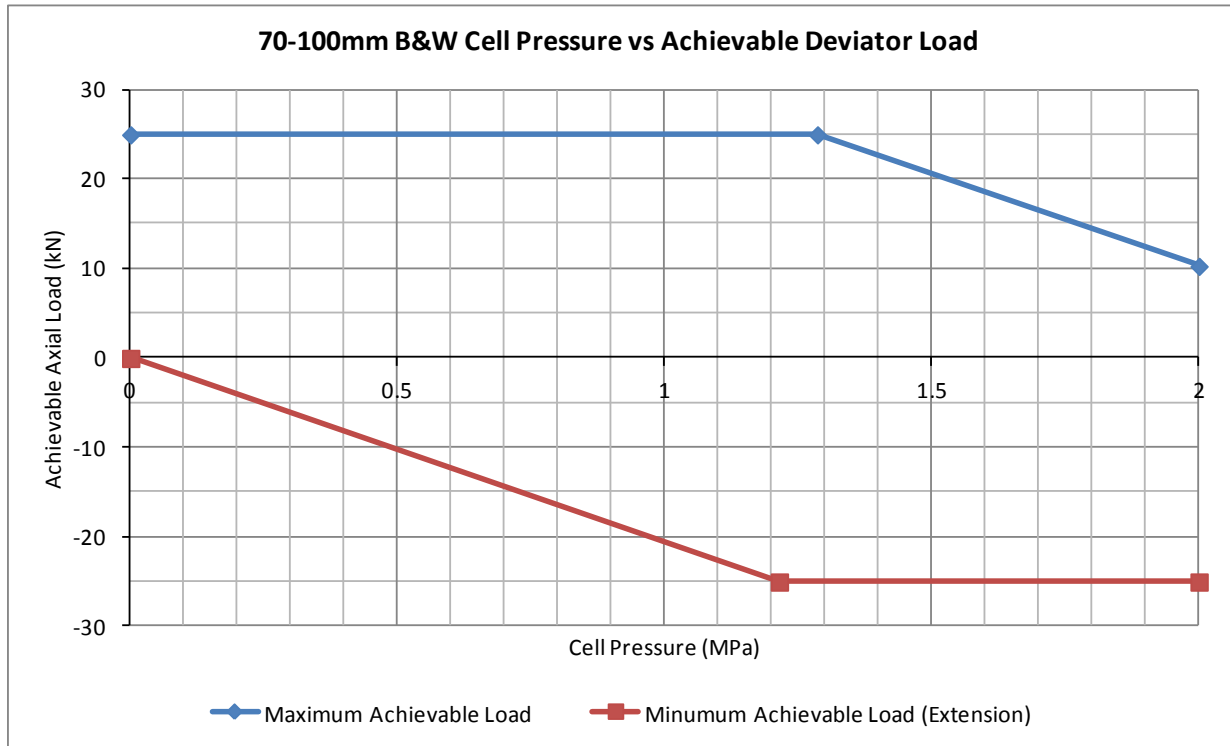


The 38-50mm cell can reach a maximum compression load of 7kN. This load can be reached at all cell pressures up to roughly 1.1MPa. Above this pressure further increases act to reduce the maximum achievable load to 4.4kN at maximum (2MPa) cell pressure.

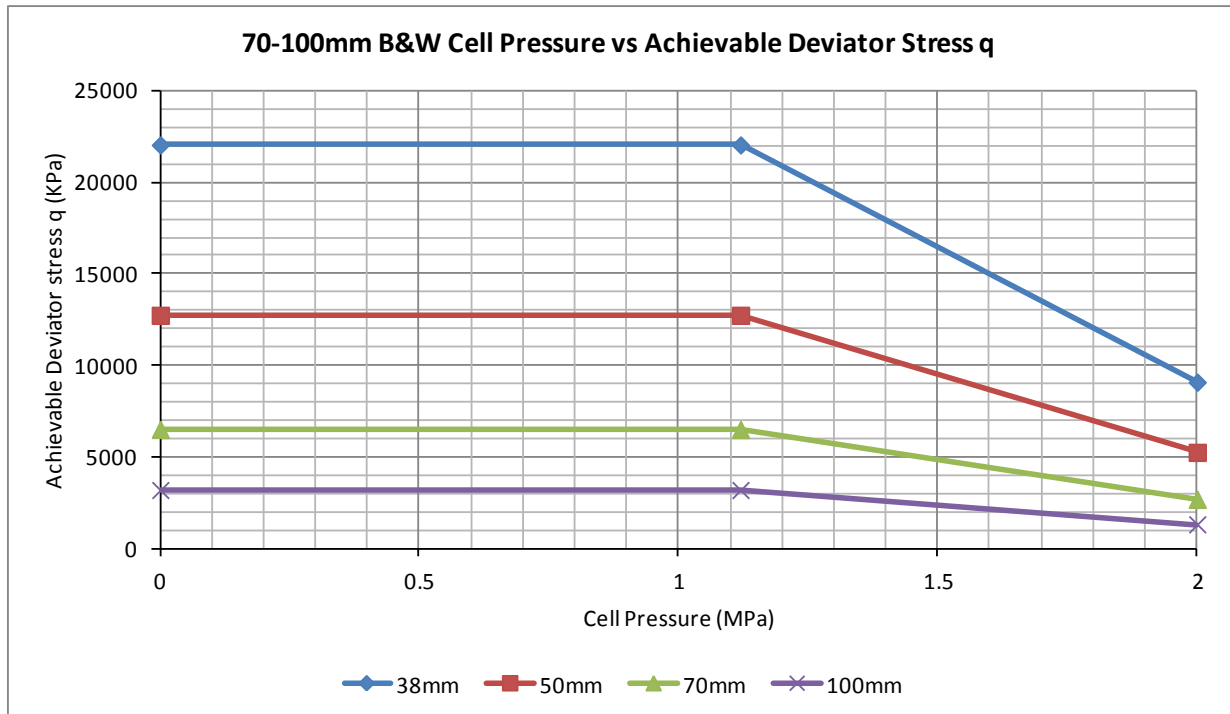


Depending on the sample size chosen there will be an envelope of achievable deviator stresses. The above graph shows maximum achievable deviator stresses for 38 and 50mm samples when tested in the 38-50mm system.

70-100mm Cell



The 70-100mm cell can reach a maximum compression load of 25kN. This load can be reached at all cell pressures up to roughly 1.3MPa. Above this pressure further increases act to reduce the maximum achievable load to 10.3kN at maximum (2MPa) cell pressure.



Depending on the sample size chosen there will be an envelope of achievable deviator stresses. The above graph shows maximum achievable deviator stresses for 38, 50, 70 & 100mm samples when tested in the 70-100mm system.