

Borehole pressure cells have a long term track record of stress monitoring in both elastic and viscoelastic rock. While typically classified as a soft inclusion, the cell may be filled with mercury to gain stiffness for use as a rigid inclusion in low modulus rock. Product development is largely the result of research done by the U.S. Bureau of Mines (Panek & Stock 1964, and Smith 1972)

Cells are available in two basic configurations, a miniature flatjack version (BPC) and a cylindrical pressure cell (CPC). Due to the flat design, the BPC responds primarily to the stress in the plane perpendicular to the cell, and is only slightly affected by stress in the same plane. Two BPC's mounted at right angles to each other in the same borehole therefore will monitor the principal stresses in the plane perpendicular to the borehole. Biaxial stress measurement will require three BPC's in the same borehole.

While not appropriate for anisotropic stress conditions, the CPC will measure the average change in the principal stresses in the plane perpendicular to the borehole.



FEATURES

Low cost	Stainless or copper construction
Simplicity of operation	Remote readout available
Field rugged and reliable	Data logger compatible

FUNCTIONS

Monitor stress in elastic and viscoelastic rock.

SPECIFICATIONS

DESCRIPTION	BPC MODEL #BPC001-X	CPC MODEL #CPC001-X
Standard Dimensions	200 x 50 x 6 mm (8.0 x 2.0 x 0.25 in.)	38 OD x 200 mm long (1.5 OD x 8.0 in. long)
	Alternate sizes, as required	
Material	Copper or stainless steel	
Range	0 – 10,000 PSI (0 – 70 Mpa)	
Sensitivity with Gauge Readout	40 PSI (300 kPa)	
Accuracy with Gauge Readout	1%	

NOTE: These dimensions are typical and may be modified to suit project requirements.
 Standard model numbers are determined as follows: eg. BPC001-X
 BPC – Borehole Pressure Cell; 001 – Standard dimensions
 X – G for gauge readout; V for vibrating wire transducer
 Non-standard model numbers are determined as follows: eg. BPCSPEC
 Borehole Pressure Cell Special
 (Specify in detail any deviation from the standard design)

OPTIONS (Specify when ordering)

Vibrating wire or strain gauge transducers in place of a Bourdon tube gauge

Readout instruments for above	Data logger systems
Hydraulic hand pump c/w hoses	Installation tools

OPERATING PRINCIPLE

Both the BPC and CPC are two, either stainless or copper plates, welded together around their periphery. The space between the plates is filled with deaired fluid, and leads to the borehole collar via a high-pressure stainless tube. Attached to this tube is a check valve and hydraulic coupler to facilitate pumping up the cell, and either a gauge or pressure transducer type readout. In a typical installation, the BPC is grouted into the borehole. Once the grout has set, the cell is pressurized to slightly over the estimated stress. The hydraulic pump is then disconnected, with the pressure being held by the integral check valve. The system is then allowed to stabilize. In elastic rocks, given the modulus of the rock, the stress change may be determined by the corresponding change in hydraulic pressure.

In rocks that exhibit plastic creep, the cell will not only measure stress change, but the final equilibrium pressure approximates the insitu stress.

Specifications may change without notice. LPB0007C

BOREHOLE PRESSURE CELLS



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The RST Instruments Management System is certified to ISO 9001:2000

