



Acoustic Velocity Transducers (GDSAV)

Systems to measure the P- and S- Wave velocities within a sample. AV sensors are generally used where pressures and load exceed those where bender elements can be used. AV sensors are based on the same principle as bender elements but the piezo ceramic elements are not exposed to the environment so they can be used at pressures up to 100MPa and loads up to 2MN. Sensors and sources are mounted in the pedestal and topcap or to the sides of the sample in some cases. Each sensor package contains a Compressional wave (P-Wave) element and two shear wave (S-Wave) elements. The Shear wave elements are set in orthogonal directions to allow two shear waves to be generated with polarisation. This is important where samples may be cross-anisotropic or even fully anisotropic.

Key Features:

Benefits to the User:

Multiple Wave types as standard:	Standard sensor package has: P-Wave, S- Wave Polarity 1 & S-Wave Polarity 2
High speed data acquisition to yield high resolution results:	Result accuracy is dependent on the resolution of time in acquired data. Higher speed data acquisition yields higher resolution results.
High Bit count:	Yields a more dynamic capture of acquired waveforms with less tuning needed.
triaxial and Hoek Cells:	Some existing GDS high pressure cells can be adapted to include GDSAV transducer sets. Please consult GDS for further information.
Vertical and horizontally mounted elements are available in some cells:	Allows users to describe fully anisotropic samples by measuring velocities in all directions and polarities.
Software controlled switching:	Once the system is set up sensors do not have to be plugged and unplugged

Tests that can be Performed:

Standard Package: Compression wave – Vertically travelling, Shear wave – Vertically travelling Polarisation Horizontal direction 1, Shear wave – Vertically travelling Polarisation Horizontal direction 2

Upgrade Options:

Horizontally mounted elements can be added to some cells.

Technical Specification:

Max Logging Speed (Single Channel):	1GHz – Single channel mode (8-bit)
When two channels are logged:	125MHz (source and receive at 14-bits), 250MHz (source and receive at 12-bits)
Data Acquisition Number of Bits:	16 (Typically 12/14 at high logging rates)
Sensor Centre frequency (MHz):	1
Timebase accuracy:	±1ppm / year
Gain ranges:	11 (spanning ±10mV to 20V)
Excitation voltage:	Up to 400
Low voltage output:	Source signal acquisition
Axial Load (MN):	Up to 2 on request
Pressure Range (MPa):	Up to 100
Specimen Diameters (mm):	38, 50 options available upon request
Weight:	Sample set 3.3 kg, Pedestal 0.95 kg & Top Cap 1.4 kg
Temperature (heating only):	100°C