



ROCK MECHANICS • ACOUSTIC TESTING

# AVS-0

## *Overburden Acoustic Velocity System*

*Acoustic velocity measurement under confining pressure — ASTM D2845*



*AVS-0 — 300 kN compression frame coupled to acoustic triaxial cell*

Geotechnical & Rock Mechanics Testing Equipment

# Overview

Acoustic triaxial system for dynamic rock characterisation

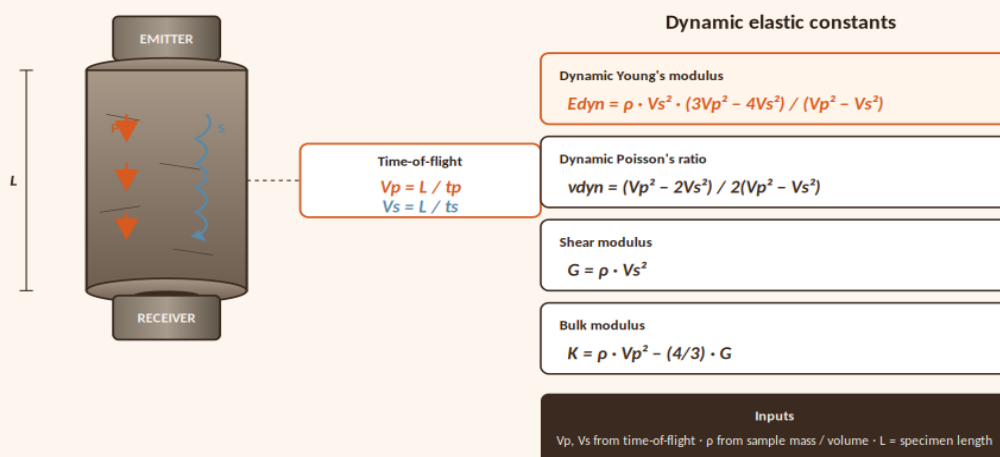
- ◆ Propagation of P, S1 and S2 acoustic waves through cores
- ◆ Confining pressure up to 10,000 psi (70 MPa)
- ◆ Automated computation of velocities & dynamic moduli
- ◆ High-pressure acoustic cell + 300 kN compression frame
- ◆ Fast pulser-receiver — ultrasonic excitation at 1 MHz
- ◆ High-speed A/D converter for clean waveform capture
- ◆ Computer-controlled with intuitive Floxlab software
- ◆ Compliant with ASTM D2845 standard

## Measurement Principle

Pulse transmission — ASTM D2845

### Wave propagation & dynamic elastic moduli

ASTM D2845 — pulse transmission through cylindrical rock specimens



### How the test works

- ◆ Cylindrical core machined and centred in HOEK cell
- ◆ Acoustic gel applied at both transducer faces
- ◆ Pulser excites at 1 MHz, P or S mode
- ◆ Receiver captures the transmitted waveform
- ◆ Time-of-flight  $t_p$  and  $t_s$  measured
- ◆  $V_p = L/t_p, V_s = L/t_s \rightarrow$  dynamic moduli computed

### Why it matters

Non-destructive elastic characterisation of cores under realistic stress — feeds geomechanical modelling, reservoir & rock-mass studies

# System Architecture

Four integrated subsystems

## 1 Compression Frame

Hydraulic frame applies axial load

- ◆ Servo-hydraulic actuator 300 kN
- ◆ Modes: force, displacement, stress, strain
- ◆ Hydraulic pressure up to 20 MPa, 1 L/min
- ◆ Ethernet interface to acquisition PC

## 2 Acoustic Triaxial Cell

HOEK-type high-pressure cell

- ◆ Steel cylinder, threaded removable end caps
- ◆ Two seated acoustic platens (P, S1, S2)
- ◆ Confining pressure up to 70 MPa (10,000 psi)
- ◆ Heating mantle option up to 120 °C

## 3 Acoustic Pulser-Receiver

Ultrasonic excitation & conditioning

- ◆ High energy & gain for attenuating materials
- ◆ Suited to low-frequency geological samples
- ◆ Auto P / S1 / S2 wave selection box
- ◆ High-speed A/D converter — clean signal capture

## 4 Data Acquisition System

PC + proprietary Floxlab software

- ◆ Fully automated acquisition and control
- ◆ Logging & display of P, S1, S2 waveforms
- ◆ Compressional & shear velocities computed
- ◆ Determination of dynamic elastic constants

# Technical Specifications

<b>Axial load</b>	300 kN	<b>Wave types</b>	P, S1 and S2
<b>Confining pressure</b>	up to 70 MPa (10,000 psi)	<b>Temperature</b>	Ambient (heating to 120 °C, opt.)
<b>Specimen Ø</b>	1.5 in (38.1 mm) — others on request	<b>Wetted parts</b>	Stainless steel
<b>Specimen length</b>	Twice the diameter	<b>Power supply</b>	110 – 220 VAC, 50/60 Hz
<b>Frequency</b>	1 MHz	<b>Standard</b>	ASTM D2845

*Unique design — rapid specimen change without draining the confining fluid*



# Get in Touch

*FloXlab — Geotechnical & Rock Mechanics Testing Equipment*

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