

## VW Strain Gauge - Embedment

Strain gauges offer the ability to measure the effect of loads, settlement or other changes in a structure. They record strain, which is a dimensionless measure of deformation. Stress is related to strain by a material's properties and is predictable within a certain range of applied strain.

Strain gauges are useful for determining the effects of applied loads to a structure, such as the loading of post tension cables or removal of temporary supports. Piles of driven, cast or pre cast construction can also benefit from strain measurement as with sufficient strain gauges information such as the depth at which the load is transferred to the soil and the percentage of the load born as end bearing can be determined.

Geosense® VWS-2100 series vibrating wire [VW] embedment strain gauges are designed for direct embedment in concrete.



### Features

- Reliable long term performance
- Rugged, suitable for demanding environments
- High accuracy
- Insensitive to long cable lengths
- Totally waterproof
- Direct embedment in concrete
- Auto resonant units available

### Applications

- Measurement of stress and strain deformation in:
- Driven and bored piles
- Tunnels and deep excavations
- Mass concrete pours
- Pre-cast piles
- Concrete dams
- Retaining walls
- Dynamic measurements w. auto resonant version
- Building foundations

### Technical Specifications

Model Number	VW S-2100	VW S-2120	VW S-2125
Gauge length	150 mm	50 mm	250 mm
Overall length	156 mm	54 mm	260 mm
Resolution	1 $\mu\epsilon$	1 $\mu\epsilon$	1 $\mu\epsilon$
Strain range	3000 $\mu\epsilon$	3000 $\mu\epsilon$	3000 $\mu\epsilon$
Accuracy <sup>1</sup>	$\pm 0.1\%$ to $\pm 0.5\%$ FS	$\pm 0.1\%$ to $\pm 0.5\%$ FS	$\pm 0.1\%$ to $\pm 0.5\%$ FS
Non linearity	<0.5% FS	<0.5% FS	<0.5% FS
Temperature range	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
Frequency range	850 - 1550	1500 - 3500	1500 - 3500

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### Specifications

- VWS-2100 vibrating wire strain gauges may be read by the VW-2106 or any vibrating wire readout device and may be readily connected using any datalogger with vibrating wire interface modules.
- Vibrating wire strain gauges output a frequency signal and are therefore insensitive to resistance changes in connecting cables caused by contact resistance or leakage to ground.
- Cable may be readily and simply extended on site without special precautions. Gauges may be read up to 1000 metres away from their installed location without change in calibration.
- VWS-2100 strain gauges are fully waterproof all stainless steel construction with coils encapsulated with epoxy resin. The protective tube assembly is totally sealed to the embedment flanges by laser welding, eliminating any possibility of seal degradation. During the testing and stressing procedures welds are fully checked by tensile testing carried out in excess of the elastic limit of the protective tube assembly.
- Strain gauge rosettes and zero strain containers are available for VWS-2100 gauge series. VWS-2125 can be used within mass concrete with coarse aggregates as heavy duty construction resists bending and the large end flanges provide a high contact area.

### Readout and Datalogger Systems

Custom datalogger systems for any number of sensors in any configuration are also available and can be designed on request. Please see our other webpage for details of readout equipment, terminal boxes and data loggers specific to vibrating wire devices.

### About PCTE

PCTE have over 30 years' experience in the measurement and testing of construction materials. PCTE can provide more than just the equipment, they can provide expert training. PCTE have a service centre in Sydney in which they can provide calibration, repairs and warranty repairs.

### Other Equipment

PCTE supply three main ranges: NDT, Lab and Geotech Instrumentation.

NDT includes: Rebound Hammers, Covermeters, Ultrasonics, GPR, Corrosion Testing, Coating Testing and Foundation Testing

Lab includes equipment for: Concrete, Cement, Aggregate, Soil, Asphalt and Metal

Geotech Instrumentation includes: Strain Gauges, Piezometers, Inclometers, Extensometers, Tiltmeters, Load Cells and Dataloggers