



## The Windsor HP Probe System

**For in-place testing  
of normal and  
high-performance concrete.**

### ***Features and Benefits***

- New electronic measuring system enhances accuracy and efficiency
- Measurement to 17000 psi (110 MPa)
- Memory for data storage and uploading to PC
- Safe: no accidental discharge and no recoil
- Fast and economical use
- Determines the developing strength of concrete; improves safety, ensures quality and reduces costs
- Monitors the strength for rehabilitation as concrete ages
- Conforms to ASTM C-803 and other official tests

# The Windsor HP Probe System

## Safe and User Friendly

The Windsor HP System does not require great skill to use and consistent results can be obtained by construction site supervisory staff or field technicians. In fact, among its users are contractors, engineers, architects, testing laboratories, ready mix concrete producers, owners, managers and government authorities. This system has widespread use in testing concrete in-situ, on conventionally placed, sprayed or precast concrete; on horizontal or vertical slabs; on floors or overhead; on fresh or mature concrete.

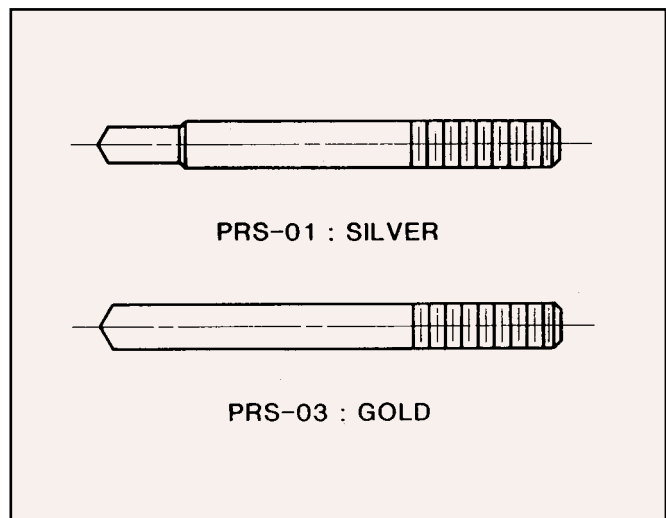
The system is safe to use. The driver cannot be discharged unless it is fully depressed with some force against the actuating template which rests against the surface being examined.

## Probes

There are two power settings available, low and standard power. The low power is used where concrete strength is less than 3000 psi (19.4 MPa).

The newly designed silver probes can be used for high performance concrete with strength up to 17000 psi (110 MPa). The probes are made of a high strength alloy, specially heat treated and annealed to achieve a hardness of Rockwell C 48. Special machining of each probe eliminates stress concentrations.

The gold probe has a 56% greater cross-sectional area than the silver; it is recommended for light weight concrete — less than 125 lbs/cu. ft. (2003 Kg/M<sup>3</sup>) in density. The silver probe is used with concrete having a density greater than 125 lbs/cu. ft. (2003 Kg/M<sup>3</sup>).





**Manual Depth Gauge**



**Front and Side View**



## **Procedure**

### **A. Actuating**

Load the driver with a power load and probe suited for the type of concrete being examined. Place the driver firmly on the actuating template and fire. The locating template is then used to locate the probes at the corners of a fixed triangle. Normally, three measurements are required for consistent and statistically reliable results.

### **B. Measuring**

The electronic measuring device is menu driven and programmed for selection according to the following parameters.

- Aggregate hardness
- Light weight, normal, or HP concrete
- American or Metric units

The three individual tests are automatically averaged and displayed on the LCD in accordance with ASTM procedure. This data together with time and date of the test are stored in the memory for subsequent uploading to a PC. An extractor is supplied to facilitate probe removal after the test.

The Standard Windsor Probe System includes a depth gauge and "Strength Chart" for determining the concrete strength.

This is an economical alternative for many concrete test environments.

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## Test Theory



**The Windsor HP Probe System.**



## Technical

The Windsor HP Probe System is designed to evaluate the compressive strength of concrete in place. It is non-destructive and can be used with equal effectiveness on fresh and mature concrete. Equally accurate results are obtained on horizontal or vertical surfaces provided that the probe is perpendicular or at right angles to the test surface.

A hardened steel alloy probe is propelled at high speed by an exactly measured explosive charge into the concrete and its penetration measured. Each power load is guaranteed to have an energy level to give an exit muzzle velocity tolerance within  $\pm 3\%$ . The compressive strength of the concrete is directly related to the resistance to penetration of the crushed aggregate and cement matrix: this is determined by the distance required to absorb the specific amount of kinetic energy of the probe. The compressive strength of the concrete is empirically related to the penetration that varies with the hardness of the aggregate. This relationship is recognized by determining the Moh's scale of hardness of the aggregate and applying a correction factor to the penetration.

The combined contributions of both the aggregate and the cement paste to concrete strength are examined by the test. The accuracy of the inferred strengths has been examined in many independent tests and trials. The Windsor HP results correlate well with the concrete strength determinations obtained by conventional means.

For most accurate test results ASTM recommends that a correlation be developed for the particular mix design being tested. Exact duplication of cylinder test results should not be expected. The probes measure the strength of the actual concrete in a structure rather than that of a sample compacted and cured under strict and somewhat artificial conditions which do not necessarily represent those of the structure itself.

The Windsor Probe test has been approved by federal, state and municipal agencies as well as a number of foreign countries. It conforms to the following tests, specifications and practices:

ASTM C803    ACI 347-78  
ANSI A.10-3    BS 1881 PART 207

## Sales Numbers & Specifications

Complete Windsor HP System	Z-WP-1000 PSI Z-WP-1000 MPA
Complete Windsor Probe Standard System	Z-WP-534
Driver Unit	Z-WP-500
Electronic Measuring Kit	Z-WP-700(MPA or PSI)
Weight of Windsor HP System	18 lbs. (8.5 Kilos)
Box of 75 Silver Probes and 75 Power Loads	U-PRS-01
Box of 75 Gold Probes and 75 Powder Loads	U-PRS-03
Weight of case of probes	8 lbs. (4 Kilos)

**NDT** JAMES INSTRUMENTS INC.  
NON DESTRUCTIVE TESTING SYSTEMS

3727 North Kedzie Avenue,  
Chicago, Illinois 60618  
1-800-426-6500 (773) 463-6565  
FAX (773) 463-0009  
e-mail: info@ndtjames.com  
http://www.ndtjames.com