



SURF™

SURFACE ELECTRICAL RESISTIVITY OF CONCRETE

OVERVIEW

Giatic Surf™ is a laboratory test device for rapid, easy and accurate measurement of the surface electrical resistivity of concrete based on the four-probe (Wenner-Array) technique according to AASHTO TP 95-11, and ASTM. Surf™ has a unique and customized setup, which enables the measurement of electrical resistivity with high accuracy by reducing the duration of test and minimizing the ambient effects.

The patented technology automatically measures resistivity around the concrete specimen using four channels of 4-probe array (located at 90° from each other). The PC software generates the required reports according to the standard specifications. The measurements can be used to estimate the resistance to the penetration of chloride ions in concrete. The qualitative relation between rapid chloride penetrability test, RCPT (ASTM C1202), and the surface electrical resistivity of concrete is presented in Table 1.

Table 1: Relationship between surface resistivity and chloride penetrability*

Chloride Penetration	56-Day Rapid Chloride Permeability Charge Passed as per ASTM C1202 (Coulombs)	Surface Resistivity @ 23 °C (kΩ.cm)
High	>4,000	<10
Moderate	2,000-4,000	10-15
Low	1,000-2,000	15-25
Very Low	100-1,000	25-200
Negligible	<100	>200

* Adapted from Kessler et al. 2005

APPLICATION

Surf™ is a laboratory device for measuring the surface electrical resistivity of concrete samples or concrete cores. This technique can be utilized for various applications such as:

- Performance-based quality control of concrete
- Estimation of chloride diffusion coefficient of concrete
- Service life design of concrete structures
- Estimation of the remaining life of concrete structures
- Crack detection in concrete elements under load
- Monitoring the setting time in fresh concrete

FEATURES

- Patented technology
- Fully compliant with both AASHTO TP95 and the upcoming ASTM standard
- Fast measurement (8 measurements < 15s)
- Four-channel surface resistivity meter
- Variable frequency (13 - 100 Hz)
- Limiting moisture loss
- Automatic report generation with PC software
- Fresh concrete testing/crack detection applications

TECHNICAL SPECIFICATIONS

General

Type	Value
Measurement Channels	4
Measurement Display on LCD	Yes
LCD Display Area	65×33 mm
Dimensions of Device	200×160×70 mm
Software	Surf™ Data Monitor

Reading Range and Accuracy

Reading Range	Frequency range	Accuracy
0.1 – 100 KΩ.cm	13 – 100 Hz	± (0.1+1%)
100 – 1000 KΩ.cm	13 – 100 Hz	± (1+1%)

Measurement Time

Frequency	Single measurement time	Testing time (8 measurements)
13 – 100 Hz	1.5 seconds	<15 seconds

Operating Conditions

Type	Value
Operating temperature	15°C - 45°C
Operating humidity	30% - 80%
Storage temperature	0°C - 60°C
Operating voltage/current	100-240 V, 50/60Hz

Note: Specifications are subject to change without notice.