



Rheology Solutions

Rheology Solutions is the sole Australian distributor of this product range and we welcome the opportunity of discussing your application requirements.

*We hope the information you are seeking is contained within this file.
If you have any questions, or require further information please contact us.
We look forward to being of further service.*

Regards from the Team at Rheology Solutions.

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The Schleibinger Curing Simulator

Theory of Operation

Temperature has a big influence in the development of strength of concrete. High temperatures are increasing strength development, lower temperatures are decreasing it. The acceleration of setting may be estimated by Sauls law. Concrete with the same mix design has the same strength at different temperature of the environment if they have the same curing factor R:

$$R = \sum \Delta t_i (T_i + 10) [\text{°C} \cdot \text{Tage}]$$

T_i mean day temperature of the concrete [°C]
 Δt_i number of days with T_i

Also more modern formulas for estimating R where suggested. See for example the standards DIN 1045 part 3 chapter 5.6.1 or ASTM C1074 - 10



(Scholz, Baustoffkenntnis 1987)

The Instrument

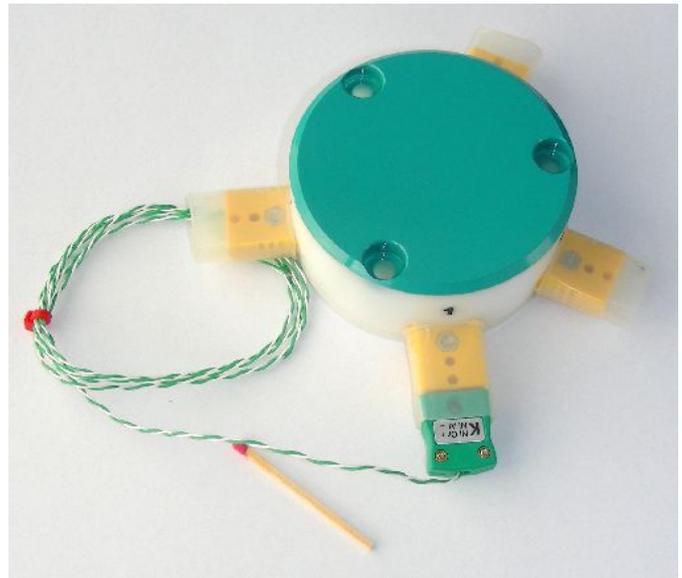
Schleibinger developed, in cooperation with the German contractor Bilfinger-Berger, an instrument for curing simulation. A sensor, placed in the fresh concrete measures the temperature. The temperature data are sent wireless to the Curing Simulator. Specimen of the same concrete are placed in a water tank. The temperature of the water is kept on the

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same temperature as the concrete part at the building site. The strength development of the specimen is the same as the strength at the building site. The measured temperature profile is recorded and may be recalled later. The temperature sensors may be connected directly or sent with a small transmitter to the curing simulator. With a built in wired or wireless modem you may access the instrument from any computer over the Internet. An optional built in cooling machine may cool down the specimen below room temperature.



The thermocouple transmitter

Status and error messages are sent automatically as e-mail and SMS short message to any computer or mobile phone.

If the mains is interrupted, the electronic is supplied by normal car battery more than 24 hours. Also a SMS is sent in this moment. If the mains supply is back gain the battery is recharged again by the [Curing Simulator](#)

The supplied pump has a capacity of 19m³ water per hour. A filter and a sacrificial anode are protecting the instrument against mud and corrosion. A RCD and several circuit breakers are protecting all electrical parts. A redundant over-temperature protection system is also installed.

In the picture you see the Schleibinger [Curing Simulator](#) at a tunneling site in Austria. By courtesy of Bilfinger u. Berger AG Germany.



The Curing Simulator at a tunneling site in Austria

Size

Height 65cm, width 50cm, depth 100cm. The instrument may run offshore.

Scope of delivery

10m robust valve, valve supply, software, TFT screen, network interface, CF card and CF card reader. User -manual .

The instrument is also available as data recorder, without pump and temperature unit.

Technical Data

Application	The temperature of concrete specimen is controlled by a circulating water bath. The target temperature is measured by a wireless device with 4 thermocouple channels. A curing number is calculated. All temperatures are recorded on a compact flash card. Temperature profiles may be re-played later on. The instrument may be totally controlled by the Internet. A WEB, FTP and Telnet server is built in.
Size (hxwxh)	650x500x1000 mm
Vessel volume	up to 1000l
Pump	19 m ³ / h max 95°C, 0,8kW, max. conveyor height 7m @ 4m ³ /h
Max. Temperature	90°C
Min. Temperature	5°C
Heating Power	2* 2,2kW = 4,4 kW
Cooling power*	> 1000W
Temperature recording building site	4 x Thermocouples Typ K. Temperature and ambient temperature as well as battery status are sent up to 1000m (free area) to the curing simulator
Size Temperature Transmitter	diameter 70mm, height 35mm, for field application
Battery lifetime of the transmitter	2 Lithium batteries, at least 3..6 months
Temperature measurement inside the curing simulator	RTD PT100 1/10 DIN B in the circulation, add. ambient temperature RTD sensor
Data recording	all temperatures, date, time, curing ratio on a CF card as text file.
Controller	Embedded in the curing simulator, user interface colored touch screen, or remote Web-browser, graphical screen for the temperature
Interfaces	1 x 100MBit TCP/IP RJ45, CF card interface

Services	WEB/http, Telnet, FTP, no special PC software necessary
Modem*	GSM/GPRS or UMTS, SMS and e-mails as alarm messages, WEB Administration, SIM card must be supplied by the user
Power Supply	3x16 A, 7kW, CEE Connector
UPS	a 12 V / 40Ah (car battery) may be connected. If the mains power is interrupted, an alarm is sent by SMS and e-mail. The electronic will record the data up to 36 hours. The battery will be reloaded during normal operation
Filter	cleaning the circulated water, easy to clean
Safety	4 automatic fuses, 1 RCD breaker, 3 redundant over-temperature protectors. low- and high pressure switches in the cooling unit. Electronic current protection for the pump. Corrosion protection by an integrated sacrificial anode.

Order Codes

Curing Simulator, incl. software, elektronik, TFT-screen, pump, UPS, heating unit, power cord, filter, CF Card, network connector, valves, 1 thermocouple channel	T0001
Wireless temperature transmitter incl. 4 thermocouples	T0006
Receiver for T0006	T0007
GSM/GPRS wireless Modem f. Internet and SMS	T0008
Cooling option for the <input type="checkbox"/> Curing Simulator	T0005

Details may be changed without notice.

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