SEMI-ADIABATIC CALORIMETRY

Standard EN 196-9

NEW COMPUTERISED LANGAVANT CALORIMETER.

For the determination of the heat of hydration of cement.

Features

The new Wireless Langavant equipment with up to 8 wireless probes is an innovative equipment, where the probes are located just above the calorimetric bottle and wirelessly transmit the obtained data to the control module, completely tactile.

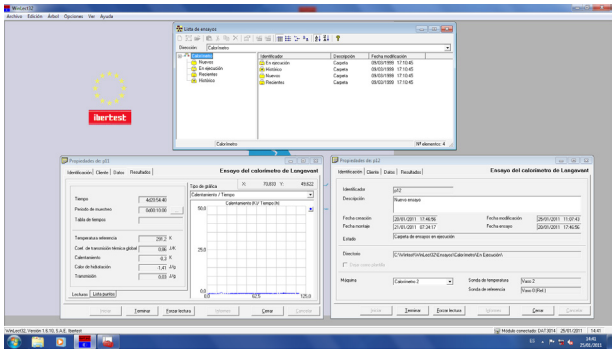
The system takes the data and sends it to the control module, which immediately transfers the data to the computer via USB or Ethernet. If this is not possible, the module stores the data almost indefinitely on its memory card until a connection to the PC is established.

Software

The results of the tests are stored, allowing their subsequent analysis and computer processing by means of the IBERTEST WinLect32 test software, developed by the IBERTEST R&D Department, specifically for the Langavant calorimetry test.

The minimum configuration includes the following elements:

- Set of 2 calorimetric insulation bottles (one for reference), with official calibration certificate.
- Set of 2 wireless temperature probes type Pt-100, 4-wire, high precision 1/10, with calibration certificate, issued by ENAC accredited laboratory.
- Set of 50 mortar pots, disposable after each test.
- Data acquisition module with 8 input and output channels USB (charger and connection) or Ethernet. Allows connection of up to 8 calorimetric bottles (7 for testing + 1 for reference).
- State-of-the-art computer, keyboard, mouse, 23.8" TFT screen, Windows® with manuals and licences.
- IBERTEST WinLect32 software licence, under Windows®, pre-installed on the supplied PC.



NOTE: All the calorimeter bottles have been calibrated and certified by the "centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement". Each bottle is individually marked and comprises a metallic plate indicating its heat loss coefficient and heat mass.

Additional accessories

Calorimeter bottle for Langavant
Ref. 210-102361
For performing more test simultaneously. A reference calorimeter must be used for 6 calorimeters, as indicated in EN 196-1.

Disposable mortar tins (box of 50 pcs)
Ref. 210-100000

Additional data adquisition module
Plugged to the standard module. Allows to connect up to 4 additional temperature probes.

Aluminum cylinder
Ref. 210-104099
To be used instead of inert cement (mixed 12 months previously) indicated in the standard.

NEW Langavant Computerised Calorimeter Specifications	
Dewar Flask	Made of silver borosilicate glass, with hemispherical bottom. Inner diameter: 95 mm. Outer diameter: 120 mm. Depth: 280 mm. Includes an insulating cap and a rubber disc 85 mm in diameter and 20 mm thick, which supports the sample container and distributes the load evenly over the glass wall.
Dewar housing	Made of 3 mm thick duraluminium, very rigid and resistant and with a wide seat base, which ensures good stability. Prepared for the Dewar cup described above to be placed inside. The Dewar cup is separated from the side walls of the housing by an air gap of about 5 mm and rests on a support about 50 mm thick. The upper edge of the Dewar cup is in contact with a 5 mm thick crown-shaped stopper and is thus immobilised in its housing. The sealing crown provides a support surface for the cup stopper and ensures a tight seal. Both the cup support and the sealing ring are made of a material with low thermal conductivity.
Insulating cover: divided into 3 parts	Lower part. It is inserted inside the vessel and limits heat loss. Central part. It consists of a disc made of foam rubber, 120 mm in diameter, which ensures the tightness of the calorimeter. Upper part. It consists of a rigid casing, with a closing device, which compresses the foam rubber disc in the central part, ensuring the sealing of the lid and the correct positioning of the Dewar cup lid.
Mortar pot, disposable	Intended to receive the cement mortar sample to be tested, it is discarded after the test. Made of standardised sheet metal, 0.3 mm thick. Diameter: 80 mm. Height: 165 mm. Volume approx. 800 cm3. Water vapour tight at a pressure of 0.3 bar. The lid of the mortar canister is fitted with a closed tube at its centre, which is intended to receive the temperature probe. The length of the tube is about 120 mm in order to reach the inner core of the sample.
Wireless data acquisition module	8 measuring channels for connecting up to 8 wireless temperature probes type Pt 100 (1 for the reference bottle temperature probe and 7 free channels, for connecting up to seven probes) USB output (charger and connection) or ETHERNET for connection to a computer Wireless distance up to 30 metres (depending on the location of the probes) Lithium battery for 3 hours autonomy. Battery charge indicator, low battery sound indicator, as well as charger (power supply) indicator, whether or not it is connected to the equipment. Date and time indications, used to record the data from the probes (DataLogger). 2.0" colour display, resolution 320x240 pixels. SD memory card slot.
Wireless probe	16-bit resolution ADC delta-sigma accuracy of 0.05% Max. full scale PT100 Platinum four-wire RTD probe PT100 Platinum high accuracy 1/10 Error code according to type of fault with PT100 probe Temperature conversion time 21ms Adjustment and calibration is stored in the instrument Lithium battery for 3 hours battery life Battery charge indicator, as well as charger (power supply) indicator, whether or not it is connected to the device 1.14" colour screen, resolution 135x240 pixels.
Data acquisition software	WinLect32 data acquisition software, under Windows®. Fully developed by IBERTEST and specific for the Langavant test. Data acquisition of up to 8 channels simultaneously. Allows continuous reading of the temperature probes, calculating the reference heat and the amount of heat emitted by the test specimens placed in the test bottles (calorimeters), thus obtaining the results of the heat of hydration corresponding to each sample, calculated according to the test standard EN 196-9. Parameterisation of tests, sample data, etc. Drawing of temperature/time curves.
Power supply	Single-phase alternating current at 220-230 V ~ 50/60 Hz