

AUTOMATIC BLAINE TEST MACHINE



This automatic microprocessor controlled automatic Blaine Air Permeability Apparatus is equipped with an automatic airproof device.

The apparatus consists of a flat enclosure with a manometer column and with 4 components stainless steel measuring cell.

Depending to the cement porosity and its density, the equipment automatically calculates the mass that to be tested and determines the constant K according to standard cement, records the test results with the possibility to elaborate an average value of different tests.

- RS 232 port.
- The defining of final Blaine value is automatically given by the apparatus.
- Supplied complete with accessories & Software

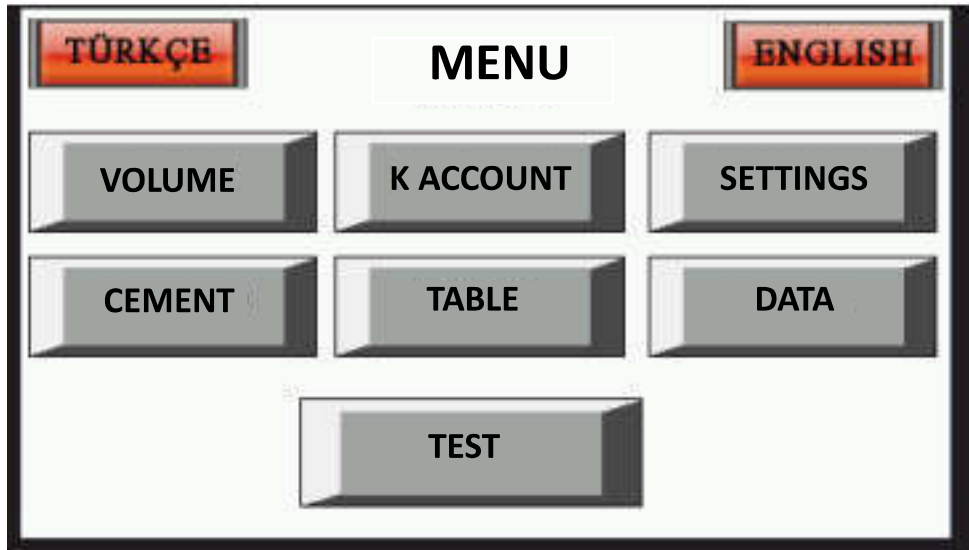
GENERAL INFORMATION

The purpose of this experiment, the time that the constant amount of air from a compressed cement bed by monitoring now is the presence of speci c surface of the cement. The bigger the cement ground cement surface means so thin. This test method is a method of comparison rather than absolute. Therefore, the device must be calibrated with a sample of known speci c surface.

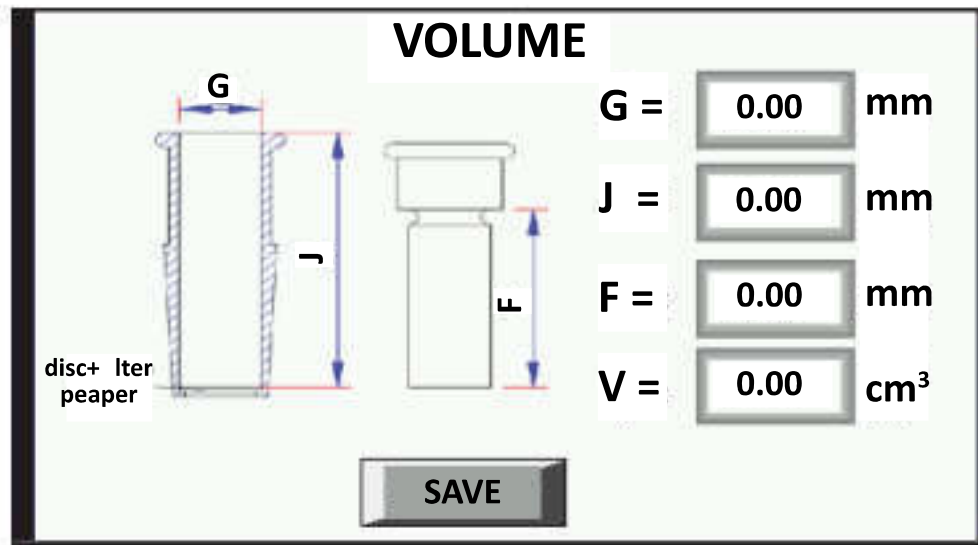
SPECIFICATIONS

- ✓ 4,3 Inch Color Touchscreen
- ✓ Device Has Mini Vacuum Pump.
- ✓ 3 No Foto Electrical Sensor
- ✓ Calculate Sample Mass On Display
- ✓ Language Turkish And English
- ✓ 100 No Test Save On Data
- ✓ Automatic Push A Start Button
- ✓ Device Have a Ptc Sensor And Saving Temperature On The Test
- ✓ User Can Select Sample And Test Not On The Machine.
- ✓ Device Power 220 Volt 50 Hz
- ✓ Weight 15 Kg
- ✓ With Device include
- ✓ Sample Cell 1 No
- ✓ Disk 1 mm Thicknes And 31 Hole 1 Qty
- ✓ Piston 1 Qty
- ✓ Thin Rule Brush
- ✓ Manometre Liquid 100 ml
- ✓ Small Funnel
- ✓ Filter Peaper

DIGITAL TOUCH SCREEN DISPLAY



Main Sreen



Volume Menu

SETTINGS

26-06-2016 17:43:15

Number of Samples for S:	0
Number of Test for S:	0
Number of Samples for K:	0
Number of Test for K:	0

SAVE

Settings Menu

MASS CEMENT

$M_o = (1 - e) \times P \times V \text{ (gr)}$

$M_o =$ g (Sample Mass.)

$e =$ Porosity

$p =$ g / cm³ Density

$S_o =$ cm² / g

SAVE

Cement Menu

DATA

User Name	testmak
Test Name	abc
Cement Type	abc
Ref. Cement	abc

BACK**NEXT**

Data Menu

TABLE			
Temperature	Mercury Density	Air Viscosity	Kok 0,1 n
16	13,560	0,00001800	0,001342
17	13,560	0,00001805	0,001344
18	13,550	0,00001810	0,001345
19	13,550	0,00001815	0,001347
20	13,550	0,00001819	0,001349
21	13,540	0,00001824	0,001351
22	13,540	0,00001829	0,001353
23	13,540	0,00001834	0,001354
24	13,540	0,00001839	0,001356

BACK

Table Menu

TEST

TEST ID :

0

Sample No

0

Test No

0

Time

0.0

Temperature

0.0

Sample 1

0.0

0.0

0.0

0.0

0.0

0.0

S1 :

0

Sample 2

0.0

0.0

0.0

0.0

0.0

0.0

S2 :

0

Sample 3

0.0

0.0

0.0

0.0

0.0

0.0

S3 :

0

SAVE

S : 0

START

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TEST PREPARATION OF THE DEVICE

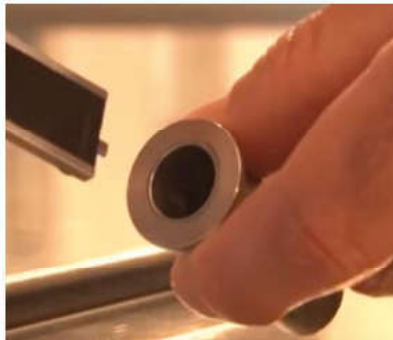
Buyer should check after receiving the product. If There are missing or broken part, should contact with supplier.
The device is working with a 220 Volt city mains.

GAUGE FILLING FLUID.



PREPARATION AND MEASURING CELL

Cell diameter (S) and Cell size (J) is measured with a digital caliper and recorded. When calculating the length should be placed perforated discs and 2 liter paper into the cell. Piston size (F) is measured and recorded menu. And the device is calculating volume of the sample's bed.



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GREASED THE CELL AND SAMPLE WEIGHT ADDING ON MACHINE

Cell surface to prevent air flow from the cell surface is lubricated with grease. Perforated disc and two pieces filter paper placed inside cells. Calculated sample weight is added into the cell. One more 1 pieces filter paper placed on and then pressure is done onto sample with by piston . And again pressure is done rotated 90 degrees.



Picture 1



Picture 2



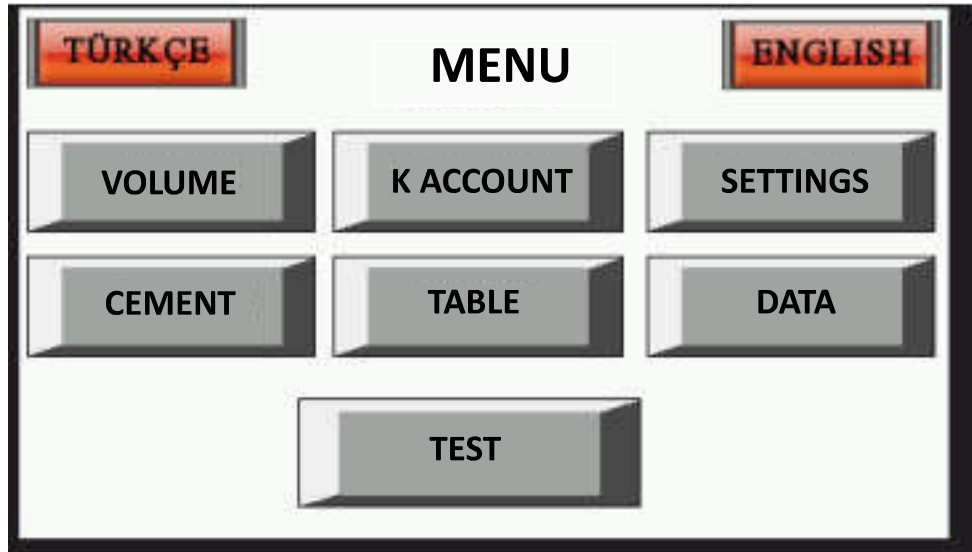
Picture 3



Picture 4

NOTE: Above all transactions reference cement and cement sample repeat the same way.

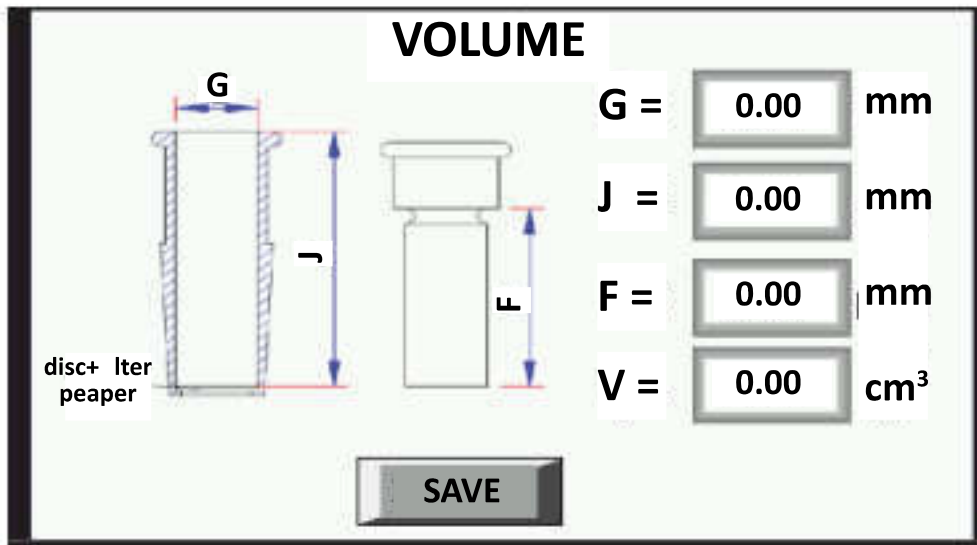
USE OF MENU



The MENU screen displays a grid of buttons. At the top, there are two language selection buttons: "TÜRKÇE" (left) and "ENGLISH" (right). In the center is a "MENU" title. Below the title, there are six buttons arranged in two rows: "VOLUME", "K ACCOUNT", and "SETTINGS" in the first row; "CEMENT", "TABLE", and "DATA" in the second row. At the bottom center is a "TEST" button.

VOLUME

After entering dimensions into this section, calculating the volume of the sample bed.



The VOLUME screen shows a diagram of a sample bed with dimensions G (width), J (height), and F (thickness). The text "disc+ lter peaper" is visible next to the diagram. To the right of the diagram, there are input fields for G, J, F, and V, each followed by a unit (mm or cm³). The values are currently set to 0.00. A "SAVE" button is located at the bottom center.

Parameter	Value	Unit
G	0.00	mm
J	0.00	mm
F	0.00	mm
V	0.00	cm ³

WEIGHT

The sample to be tested is used for calculating the weight. This part is of the entered porosity of sample (e) and density of cement (p) to find the sample weight.

MASS CEMENT

$M_o = (1 - e) \times P \times V \text{ (gr)}$

Mo = g (Sample Mass.)

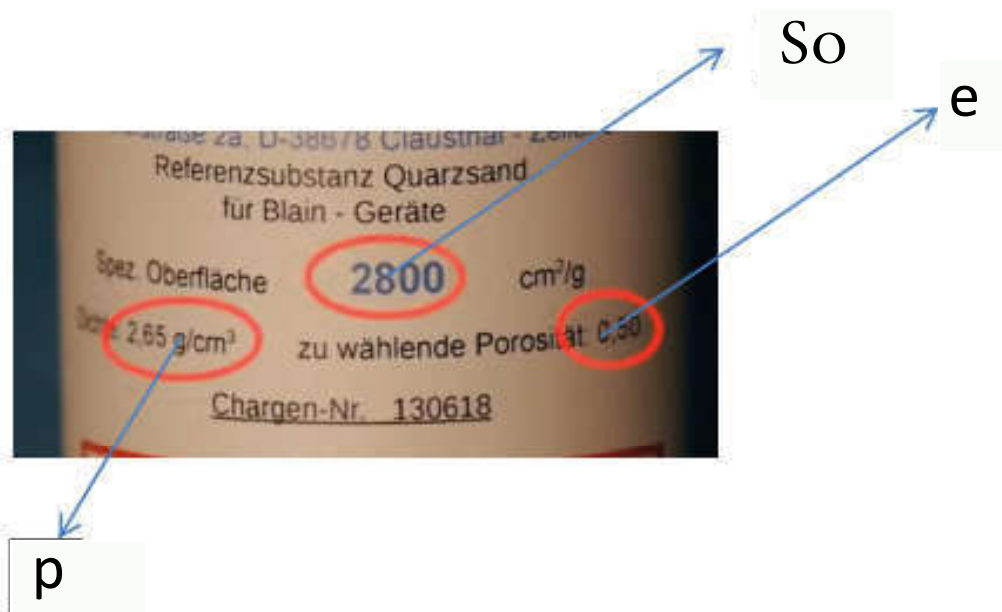
e = Porosity

p = g / cm³ Density

So = cm² / g

Cement Menu

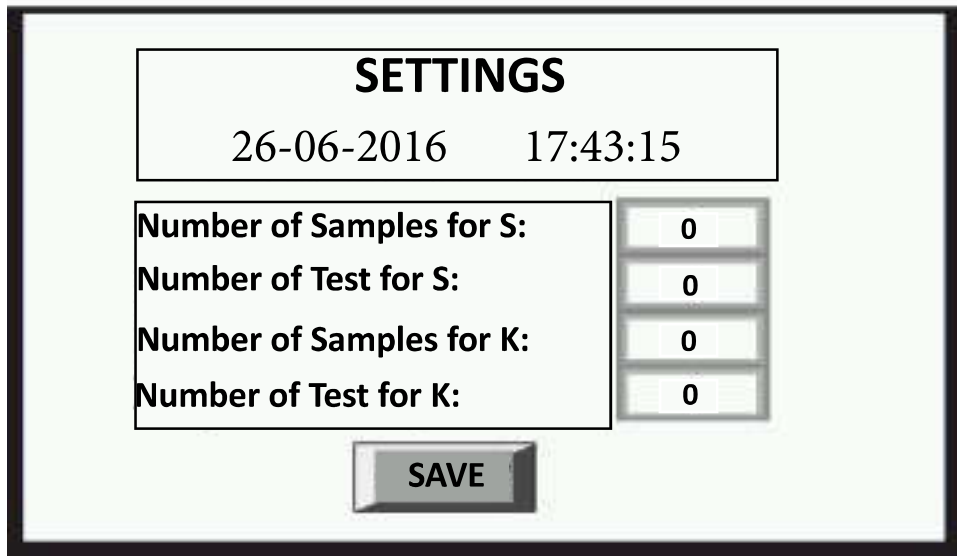
👉 e-p-So values are reference values are located on cement.



SETTINGS

This section is determines device constant k of the of the, number of test and number of test for surface permeability.

Test is do the 3 test before sample deformation and take the average of three test for best results.



SETTINGS

26-06-2016 17:43:15

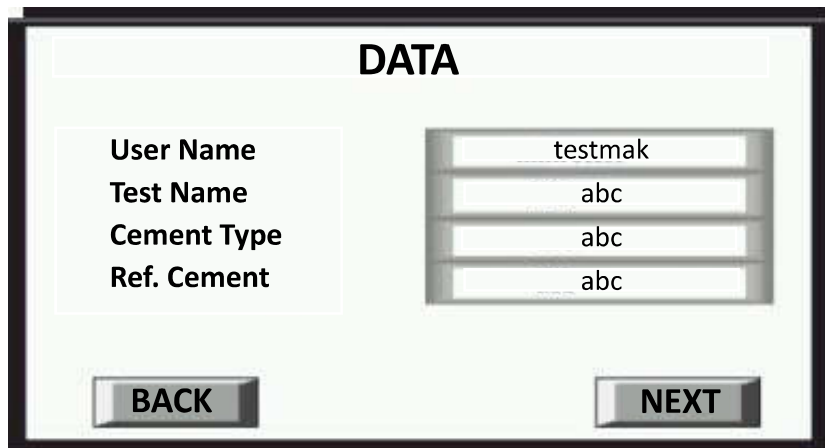
Number of Samples for S:	0
Number of Test for S:	0
Number of Samples for K:	0
Number of Test for K:	0

SAVE

Settings Menu

DATA

In this section, the user name, test number, type of cement and cement reference information will be entered into.



DATA

User Name	testmak
Test Name	abc
Cement Type	abc
Ref. Cement	abc

BACK **NEXT**

TABLE

The following values are taken from temperature sensor inside the device. And assigned to the value of formula. Tables are for informational purposes.

TABLE			
Temperature	Mercury Density	Air Viscosity	Kok 0,1 n
16	13,560	0,00001800	0,001342
17	13,560	0,00001805	0,001344
18	13,550	0,00001810	0,001345
19	13,550	0,00001815	0,001347
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21	13,540	0,00001824	0,001351
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23	13,540	0,00001834	0,001354
24	13,540	0,00001839	0,001356
BACK			

Table Menu

CALCULATION OF THE DEVICE K CONSTANT

K constant is will be constant for which is used reference cement.

- 1- When a new gauge connect to the device.
- 2- After changed hydraulic oil in manometer.

K constant must be recalculated when a different reference cement used. Otherwise, In the tests to be performed recently k constant is used.

Constant K Calculation

Sample No	Test No	Time	Temperature
0	0	0.0	0.0

Sample 1		Sample 2		Sample 3	
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0
K1 : 0		K2 : 0		K3 : 0	

SAVE

K : 0

START

$$K = \frac{S_o \rho_o (1-e) \sqrt{0,1 \eta_o}}{\sqrt{e^3} \sqrt{t_o}}$$

- S_o = Specific surface of the reference cement. (cm^2 / g)
 ρ_o = The density of the reference cement. (g / cm^3)
 t_o = The average of the three measured time. (s)
 η_o = Air viscosity in three average temperature. (Pa.s) (Table 1)

If Porosity $e = 0,500$

$$K = 1,414 S_o \rho_o \frac{\sqrt{0,1 \eta_o}}{\sqrt{t_o}}$$

The average of three K values is taken as K constant of the device.

TEST

As in reference cement, surface permeability is calculated from by device with following formula. And s is automatically calculated.

TEST

TEST ID : 0

Sample No	Test No	Time	Temperature
0	0	0.0	0.0

Sample 1

0.0	0.0
0.0	0.0
0.0	0.0

S1 : 0

Sample 2

0.0	0.0
0.0	0.0
0.0	0.0

S2 : 0

Sample 3

0.0	0.0
0.0	0.0
0.0	0.0

S3 : 0

SAVE

S : 0

START

Assay specific surface and S of the cement made is calculated by the following formula.

$$S = \frac{\rho_o}{\rho} \times \frac{(1 - e_o)}{(1 - e)} \times \frac{\sqrt{e_o^3}}{\sqrt{e^3}} \times \frac{\sqrt{0,1 \eta_o}}{\sqrt{0,1 \eta}} \times \frac{\sqrt{t}}{\sqrt{t_o}} \times S_o \quad (\text{cm}^2 / \text{g})$$

- So= Specific surface of the reference cement. (cm² / g)
e = Porosity of to be made of the testing cement.
e_o = Porosity of the reference cement.
t = Measured when testing for ne cement. (s)
t_o = The average of the three measured time of the reference cement. (s)
t_o = Three times the average of the measured reference cement.
p = The density of to be made of the testing cement. (g / cm³)
p_o = The density of the reference cement. (g / cm³)
n = Air vizikosite in three average temperature. (Pa.s) (Table 1)
n_o = The average of the three measured time. (s)