



**SAKARYA**  
ÜNİVERSİTESİ

**Sakarya University Faculty of Engineering, Department of Civil Engineering**  
**Construction Materials Laboratory Equipment Catalog**



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## SPECIFIC GRAVITY FRAMES

### Equipment / Device Information

The Specific Gravity Frame is used in conjunction with a suitable precision balance to determine the specific gravity of coarse aggregates and to determine the density of hardened concrete, hardened mortar samples, bituminous mixtures and natural stones.

The Specific Gravity Frame consists of different equipment such as a precision electronic balance that can measure under the body, a sample hanger, a wire basket (wide and high enough to hold the samples) and a plastic water bucket. The lower part of the stand consists of a movable platform carrying the plastic water bucket, which allows weighing of samples both in air and in water.



### Technical Specifications of the Equipment / Device

Standards	TS EN 1097-6 / TS EN 12390-7 / ASTM C127 / ASTM C642
Weight (approx.)	25 kg
Dimensions	600x500x1100 mm

## LOS ANGELES ABRASION / FRAGMENTATION MACHINE

### Equipment / Device Information

The Los Angeles abrasion / fragmentation machine is used to determine the resistance to fragmentation of aggregates subjected to abrasion and impact in a rotating steel drum containing an abrasive load of steel balls. The Los Angeles abrasion / fragmentation machine consists of an electronic control unit and a closed, hollow cylindrical steel drum (inner diameter 711 mm and inner length 508 mm) rotating around its horizontal axis. The drum rotates at 31-33 revolutions per minute. When the automatic counter on the machine reaches the set number of revolutions, the machine stops automatically with the help of the electronic control unit. At the end of the experiment, both the sample and the steel balls are discharged from the drum and collected in the steel collection tray.



### Technical Specifications of the Equipment / Device

Standards	TS EN 1097-2 / TS 13450 / ASTM C131 / ASTM C535
Weight (approx.)	380 kg
Dimensions	850x1000x1100mm
Power Supply	220 V / 50-60 Hz

## AUTOMATIC CEMENT/MORTAR MIXER

### Equipment / Device Information

The cement/mortar mixer is used for homogeneous mixing of mortar and cement mixtures designed in accordance with the relevant standards and thus producing the designed mixtures. The cement/mortar mixer has a mixing bowl with a capacity of approximately 5 liters, a mixing paddle and an automatic sand discharge device. Using the control unit on the mixer, the user can manually select the rotation speed of the mixing paddle on its own axis and in the orbit of the bowl. The automatic sand discharging device also allows the sand to be automatically discharged into the mixing vessel using the control unit.



### Technical Specifications of the Equipment / Device

Standards	TS EN 196-1 / TS EN 196-3 / ASTM C187 / ASTM C305
Weight (approx.)	56 kg
Dimensions	300x555x610 mm
Power Supply	220 V / 50-60 Hz

## AUTOMATIC VICAT APPARATUS/ VICAT TEST SETS

### Equipment / Device Information

Both automatic vicat apparatus and vicat test sets are used to determine the setting start and setting end times, which are the most important parameters for quality control of materials such as cement and mortar. These two equipment are also used to determine the consistency of materials such as cement and mortar. The setting start time is defined as the time elapsed when the vicat needle sinks 3-5 mm on the mortar or cement sample placed in the vicat mold after mixing cement and water, and the time elapsed when the vicat needle sinks at most 1 mm on the sample surface is defined as the setting end time. These times are performed automatically in the automatic vicat apparatus, while they are performed manually using vicat test sets. The automatic vicat apparatus has devices such as vicat mold, socket start and end needles, centering ring and glass plate. The vicat test set consists of parts such as vicat mold, socket start and end needles, glass plate and consistency probe.



### Technical Specifications of the Equipment / Device (Automatic Vicat Apparatus)

Standards	TS EN 196-3 / TS EN 480-2 / ASTM C187 / ASTM C191
Weight (approx.)	10 kg

Dimensions	200x400x410 mm
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## CONCRETE MIXER

### Equipment / Device Information

Concrete mixer is used to ensure homogeneous mixing of concrete consisting of cement, water, fine and coarse aggregates, chemical and mineral additives, etc. Concrete mixer is also used for homogeneous mixing of mixtures containing clay + cement or geopolymer. The dimensional volume of the mixing chamber is approximately 45 liters and the effective mixing capacity is 25 liters. Unlike conventional pan mixers, the concrete mixer is equipped with a second engine and an associated mixing paddle, which enables highly efficient mixing of small volumes of mixtures.

The mixing process can be observed thanks to the top cover of the mixing chamber, which is designed to be opened. This allows the decision to continue or complete the mixing process.

The mixing bowl can be tilted to the front in a controlled manner in order to empty the mixture inside. This also provides convenience in cleaning the mixer. In addition, the concrete mixer can be easily transported with the help of its wheels.



## CEMENT FLOW TABLE

### Equipment / Device Information

The cement flow table is used to determine the consistency (workability) of mixtures prepared using materials such as cement, lime and gypsum. The rate of fall in the cement flow table is adjusted by manually turning the wheel of the tester in accordance with the relevant standards. The cement flow table is used in conjunction with devices such as flow molds and rammer.



### Technical Specifications of the Equipment / Device

Standards	TS EN 459-2 / ASTM C230
Weight (approx.)	13 kg
Dimensions	260x260x270 mm

## CONCRETE AIR METER

### Equipment / Device Information

The concrete air meter is used to determine the air content in fresh concrete. The concrete air meter consists of a flanged cylindrical container with a capacity of 7 liters and a flanged cover with manometer (pressure gauge), air pump, air cell, air discharge valve, water inlet and discharge valves on this cylindrical container. The pressure gauge is graduated in 0.1% intervals



up to 6% air content and in 0.2% intervals from 6% to 10% air content. The device is not affected by changes in ambient pressure. The concrete air meter can be used in concretes produced with aggregates with a maximum grain size of up to 63 mm.



#### Technical Specifications of the Equipment / Device

Standards	TS EN 12350-7 / ASTM C231
Weight (approx.)	16 kg
Dimensions	300x310x620 mm
Capacity	7 litre

#### **VIBRATION TABLE**

#### Equipment / Device Information

The vibration table is used for compaction of fresh concrete placed in cube or cylinder molds with the help of vibration. The vibration table consists of a vibration motor, control unit and mold clamping device. Two cube or two cylinder molds can be connected to the vibration table at the same time.



### Technical Specifications of the Equipment / Device

Standards	TS EN 12390-2
Weight (approx.)	52 kg
Dimensions	610x380x800 mm

## **LABORATORY OVEN**

### Equipment / Device Information

The laboratory oven is used for drying materials such as concrete, asphalt, cement, clay and aggregate. The 120 liter capacity laboratory oven has an operating temperature range between ambient temperature and +200 0C. The laboratory oven is equipped with a direct reading digital control unit and analog high temperature protection thermostat. The desired temperature value can be set with the help of the digital control unit.



#### Technical Specifications of the Equipment / Device

Standards	TS EN 932-5 / TS EN 1097-5 / ASTM C127 / ASTM C136,
Weight (approx.)	56 kg
Dimension (İnternal)	610mm x 500mm x 400mm
Dimension (External)	770mm x 750mm x 650 mm

### **CONCRETE PRESS**

#### **Equipment / Device Information**

The concrete test press is used to perform compressive strength tests of cube or cylinder specimens of different sizes. The maximum loading capacity of the concrete test press is 2000 kN. The concrete test press can be controlled both by using computer software and by using the control panel on the device with the support of an automatic microprocessor. After the specimen placement is completed and the test parameters (such as specimen dimensions, speed, etc.) are set, the whole process after pressing the start button from the control panel is realized automatically. The maximum load at which the specimen breaks is recorded by the device and can be viewed on the control panel after the experiment is completed.

The body of the concrete test press is a rigid structure with 4 columns and the columns are independent from the upper and lower parts of the body. There are safety doors on the front, side

and rear parts of the test press in order to avoid any unfavorable situation during the test. The maximum length of the specimen that can be placed between the upper and lower plates of the test press is 320 mm.



#### Technical Specifications of the Equipment / Device

Standards	ASTM C39 / TS EN 12390-3
Weight (approx.)	1165 kg
Dimensions	1100mm x 600mm x 1100mm

### **BENDING TEST MACHINE**

#### **Equipment / Device Information**

The bending test machine is used to perform bending strength tests of specimens of different sizes and properties such as concrete, cobblestone, natural stone. The maximum loading capacity of the tester is 200 kN. The bending test machine can be controlled both by using computer software and by using the control panel with the support of an automatic microprocessor. After the specimen placement is completed and the test parameters (such as specimen dimensions, speed) are set, the bottom plate of the tester moves upwards by means of a closed circuit hydraulic pump after pressing the start button on the control panel. After the gap between the load cell and the specimen is closed, the load transfer to the specimen starts and the

loading continues until the specimen breaks. The maximum load at which the specimen breaks is recorded by the device and can be seen on the control panel after the experiment is completed.



Bending Test Machine is used for bending strength test with midpoint loading in accordance with TS EN 12390-5, ASTM C78 and ASTM C293 standards on 100x100x400-500 mm and 150x150x600-750 mm sized specimens.