

AUTOMATIC DENSITY GRADIENT COLUMN	DATA SHEET
The density gradient column is a method for determining density for solid materials at a temperature of 23°C (± 0.1°C), with an accuracy of 0.0001 g/cm3, within a measurement range of 0.8 ÷ 3 . 3 g/cm3, based on the adopted marker floats at known density.	



Technical characteristics:

- Bath capacity : 18 liters •
 - Two or three pyrex columns of length 850 mm, Ø 55 mm, depending on the model.
 - 9" touch screen display for controls.
 - Integrated system for water circulation inside the bath.
 - Integrated system (heating and cooling) for autonomous management of tank temperature (with room temperature from 15°C to 27°C) heating 10°C/h, cooling 3°C/h. Without external systems.
 - Possibility of connection to an auxiliary cooling system, such as a chiller or open system. (For particularly hot environments or to speed up the achievement of the set temperature).
- Buttons for manual Y-axis movement .
 - Drainage system at the bottom of the column for easy emptying.
 - Double LED strips for optimal illumination

Standards	
ASTM	D1505
ISO	1183-2

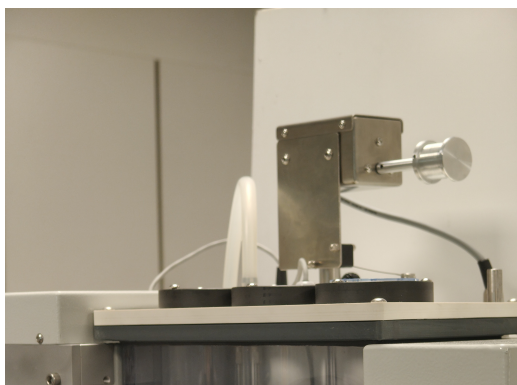
To ensure the accuracy of results, the density gradient equipment is equipped with digital temperature control to ensure that the temperature of each column is 23°C. For ambient temperatures above 23°C, the built-in cooling coil can be used in combination with the **watercooling unit (40380731)** in order to maintain the correct temperature.



Principle :



Floats of known density are immersed in the column and stop, during sinking, when their density exactly matches the density of the solution reached. Therefore, to determine the density of a sample, it is necessary to immerse it in the same column and expect it to stop because the equilibrium between its own density and that of the solution has been reached. The reference position of the marker floats along the column and the stable position of the sample provide the determination of the density of the sample. Repeated tests have shown that the gradient density distribution does not vary for more than 40 weeks.



The instrument is equipped with a motorized system for retrieving floats and samples using a glass or metal basket without altering the gradient. The system is integrated into the column assembly

AUTOMATIC GRAVITY SYSTEM(10006016)
Specifications:

For liquid filling, the columns consist of a trolley on wheels, equipped with a magnetic stirrer, two 2000 ml conical flasks with conical connection, glass taps, fitting and shut-off, silicone tubing and ground ball joints to be placed on the floor stand. The column filling system with peristaltic pumps makes it possible to automatically fill the column by adjusting the density with high precision.

The system allows the definition of filling cm (formula: $\text{ml} = \text{cm} * 19.6$) with variable density and possibly a head and tail with fixed density (minimum and maximum).

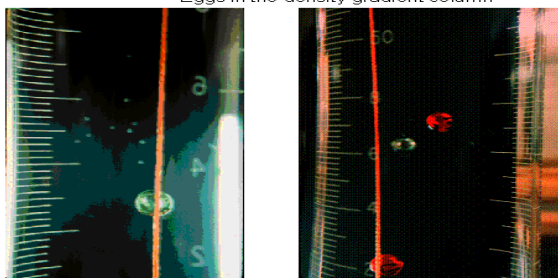
- Dimensions: 570 x 400 x 1200 mm
- Weight: 25 kg (approx.)
- Power supply: 230 V - 50 Hz

The control system enables three distinct working functions defined with LOW, MIX and HIGH. Two methods (A- B-) with one or two pumps.



Includes stand with magnetic stirrer, two conical flasks with connections and silicone tube.

Eggs in the density gradient column



The equipment is controlled by means of a touch screen located on the front of the FILLING SYSTEM; the control panel allows the calibration of the pumps and column with the set parameters.



Selection of liquids

Double-distilled water and anhydrous ethyl alcohol or other liquid suitable for the gradient are required for preparing the solution.

Density range g/cm ³	
0.85 ÷ 0.98 Ethanol - Water	
0.85 ÷ 1.59 Ethanol - Carbon tetrachloride 0.98 ÷ 1 Ethanol/water - Water/potassium iodide	
1 ÷ 1.6 Water - Potassium iodide	
1.10 ÷ 2.6 Tetrabromoethane - Triethylphosphate	

Effect of liquids on specimens:

The two liquids or the solution in the gradient column must not alter the test specimens by chemical reaction or absorption, otherwise errors will occur in the determination of the density of the test specimen.

Many plastics are affected by the liquids used in the gradient columns, and especially when testing thin films that have a high surface area/volume ratio, even a slight absorption of water may be sufficient to give slightly erroneous results. To test whether the sample is stable in the chosen liquid mixture, take a sample of the same size as the one to be tested in the column; weigh it; immerse it for 2 hours in a beaker containing some of the mixture; dry it; and then reweigh it. If the weight changes after immersion, it is reasonable to assume that the sample is not stable in this mixture and that other liquids should be used for the column.



Dimensions: 420 x 780 x 1220 mm h

Code	Description
10006035	Two columns Density gradient
10006036	Three columns Density gradient
10006001	Kit 8 floating spheres with known density density 0.84 ÷ 1.59 g/cm ³ certified
10006005	Known density floating sphere 0.84xx ÷ 1.59xx g/cm ³ certified
10006007	Known density floating sphere 1.60xx ÷ 2.30xx g/cm ³ certified
10006016	Automatic gravity system for High and Low with all accessories
40380731	Led Display Chiller 15L/min
78000716	Metal basket