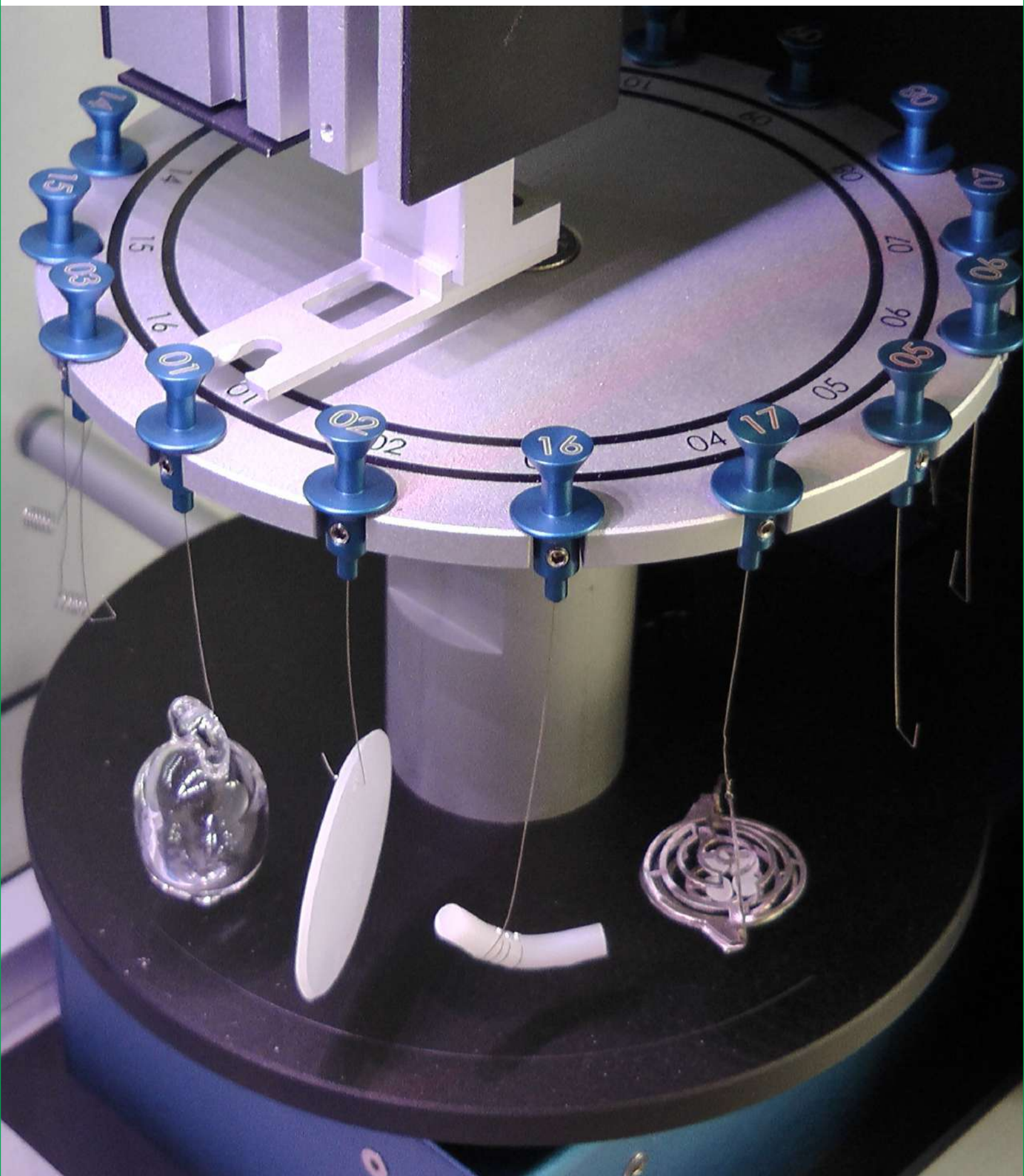# MVS2proDENSITY

The Automatic Determination of the Volumic Mass

Reliable • Reproducible • Certifiable

Ortelli
Technologies

Data Sheet

MVS2pro is a robotized system for the determination of the Density or the Standard Absolute Volumic Mass (MVS) of polymers by the principle of the Hydrostatic Push opportunely corrected in order to obtain the result expressed in the MV (S) unit.

MVS2pro determines the Volumic Mass in a completely automated cycle that replaces the old system used for this measure (Gradient Columns), that was characterized by typical human errors and slowness in measurement.

MVS2pro System is perfectly integrated in the quality Standard Process ISO9001. It's already supported by all the control procedures for the carried out measures using five different kinds of Standard:

- *1 certified Density Standard*
- *1 certified Mass Standard*
- *1 certified Volume Standard*
- *1 polymer standard*
- *1 standard Temperature (certificated thermometer)*

All integrated in a statistical plan of controls to check the validity of the analytical determinations of the samples.

MVS2pro has an Autosampler with a maximum of 16 samples and/or Standard of density mass or volume. The system makes the measure of a sample in about than 120 sec.

MVS2pro constantly controls the Temperature to which it comes carried out the measure to have the certainty that will be respected the range of working set in the method.

This **Pt100 probe** can be calibrated using the procedure from the management software with a Corporate primary standard for comparison.

MVS2pro was born for the determination of MVS on **High Density Polyethylene (HDPE)** but it is obviously usable for the same kind of determination with other kind of materials can be **analyzed with the method of the hydrostatic push**. Integral control of the **MVS2pro** system takes place via LAN from a software console, included in the price, that is installed on a PC in the corporate network (or, if necessary, with a direct connection to the PC).

The software console allows you to control the system and keeps DB archive of all historical data and all the measurements made to obtain it. It is possible to recalculate archivied data with other types of applications like Excel, Access and transfer them directly to LIMS.

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Technical Data

- **Model:** MVS2pro
- **Reproducibility:** < 0.01%
- **Range of Temperature:** from 10°C to 50°C (usually 23°C)
- **Medium Time of Analysis:** 120 s/sample
- **Sample dimensions:** diam. approx 4 cm
- **Autosampler:** 16
- **The System MVS2pro is compliant to the ISO1183-1, ISO2781, ASTM D792, ISO 4591 and ISO 293 for sample preparation**

Accessories (required)

Support samples series
are available in four colors:
Blue, Gold, Green and Red.

Watch the Video!

Basket Support samples

MODEL A
The kit is composed by 20 basket supports. In the perforated basket support you can include some polyethilene spheres or other material like fragments of glass or precious stones (diamonds). These kits can becombined in various ways accordingly to your needs.

Helicoid form Support sample

MODEL B
The kit is composed in this way: 20 Helicoid form supports. This kind of supports are suitable to be used with cylindrical forms. (for e.g. the same polyethylene samples forms measured with Gradient Columns)
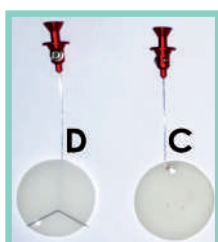
Hook form Support sample

MODEL C
The kit is composed in this way: 20 Hook form supports. This kind of supports are suitable to be used circular pressed disks with a hydraulic press.

Self-Sinking Support sample

MODEL D and MODEL E
The kit is composed in this way: 20 Self-Sinking Sample supports. This kind of supports are suitable to be used with circular pressed disks. This support type allows you to measure samples which has a density higher than the measure liquid ones, thanks to the support structure that allows the sample to "float" in the solution.

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Sinking form Support sample

MODEL F and MODEL G
The kit is composed in this way: 20 Sinking forms supports. This kind of supports are suitable to be used with circular pressed disks. This support type sinks samples, which has a very low density in relation to the solution ones, allowing to measure density also in this case.

Glass Cover Wind Protection Assy
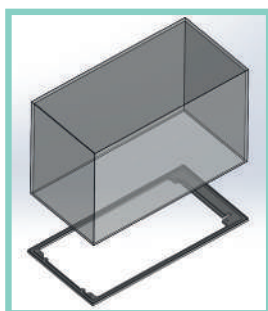
Device perfectly compatible with the MVS2pro system allows to protect the balance from interference for example air displacements inside the laboratory, allowing a better stabilization of the balance.

Thermostatic Bath

System of thermostatation for the beker (beker thermostatable). It allows the maintenance of the liquid measurement at the temperature described in the method. The system has a suction pump to recirculate the thermostated liquid in an external circuit and it is directly controlled by MVS2pro via USB.

Mettler Analytical Balance

Analytical Electronic Balance with underplane support weight to position the support sample in the measurement area of the MVS2pro. The balance suggested is 5 decimal places in grams like: MS, XSR, XPR series (d= 0,01 mg). The Balance is directly controlled by MVS2pro via USB

Certified Density Standard and Mass

Certified Density Standard in Glass.

Certified mass for the adjustment of the analytical balance with external weight to maximize the accuracy of the system.

PC (keyboard+mouse+monitor)

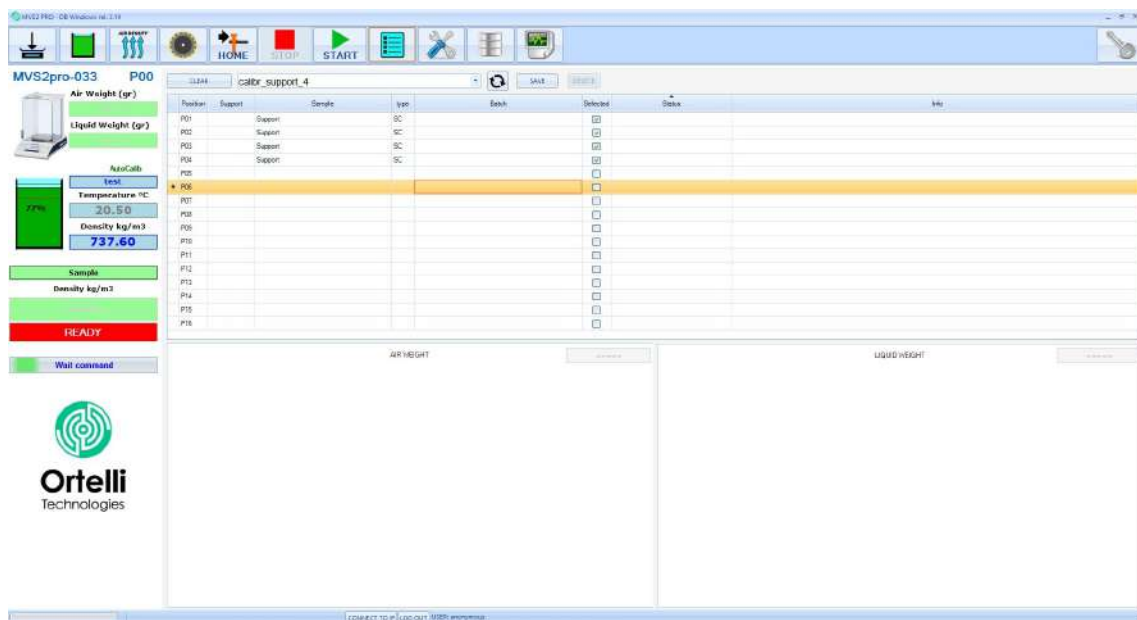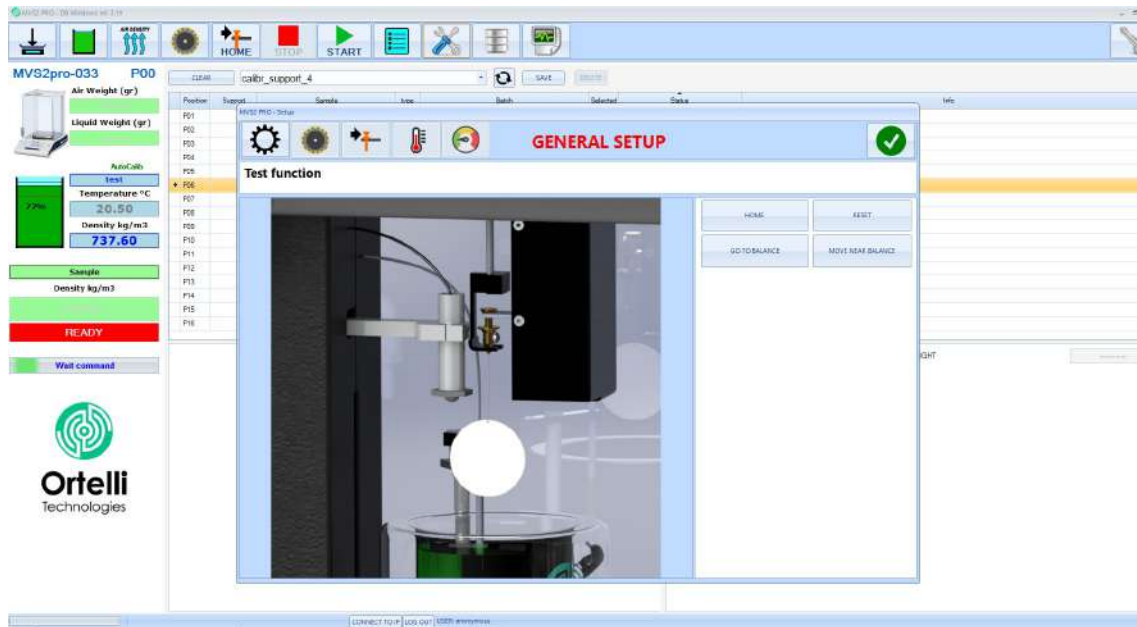OS: WINDOWS10 with pre-installed MVS2pro Density Manager Software

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Solid density measurement methods comparison

(focus on MVS2pro Density System)

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|	GRADIENT COLUMN method	IMMERSION method with MVS pro system	LIQUID PYKNOMETER method	TITRATION method
Certified Reference	**Little glass sphere** ~ 5 mm Density range 0,85 ÷ 2,3 g/cm³ Volume ~ 65 mm³	**Glass ampoule** ~ 40 mm Density ~ 1,2 g/cm³ Volume ~ 7.500 mm³ **100 times bigger!**	**Pycnometer** ~ 50/100 ml *Density need to be calculated each time*, since it varies over time due to thermal expansion	**Burette** ~ 25 ml Volume ~ 0.05cm³ Very difficult to realize and not so much used
Sample Shape *Analysed*	**Irregular cylinder** like of the same size as the certified standard.	**Disk** whose dimensions are not linked to specific reference standards. therefore it can also have much larger dimensions than those of the sample used in gradient columns.	**Granules or flakes** in whatever form they are received, however their mass shall be in the range from 1g to 5g. Mostly used for measuring "apparent density"	**Void-free forms**
Sample *Preparation*	**Melt Index** The sample preparation doesn't follow any standard procedure	**It follows the ISO 293** it uses standard sample production	**No sample preparation procedure**	**Void-free forms** The sample preparation doesn't follow any standard procedure
Standards	ISO 1183 -2	ISO 1183 -1 A	ISO 1183 -1 B	ISO 1183 -1 C
Type of *measurement*	*Indirect* by curve interpolation	*Direct* by direct measurement of the sample	*indirect* by comparing the internal volume weight with and without the sample	*Direct* but with a Mix of liquids changing continuously. *It's difficult to define the end of titration*
measuring **Liquid**	**Mixture** of substances with different densities	**Pure liquid** of known density measured continuosly	**Pure liquid** of known density	**Solution** of different liquids
Time Analysis	**Hours**	**120 s/sample** (6-9 samples/40 min)	**Hours**	**Hours**

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![Ortelli Technologies logo]

Our Density Management Software

Easy and immediate method setting up to 16 samples (including the use of templates predefined by the manager).

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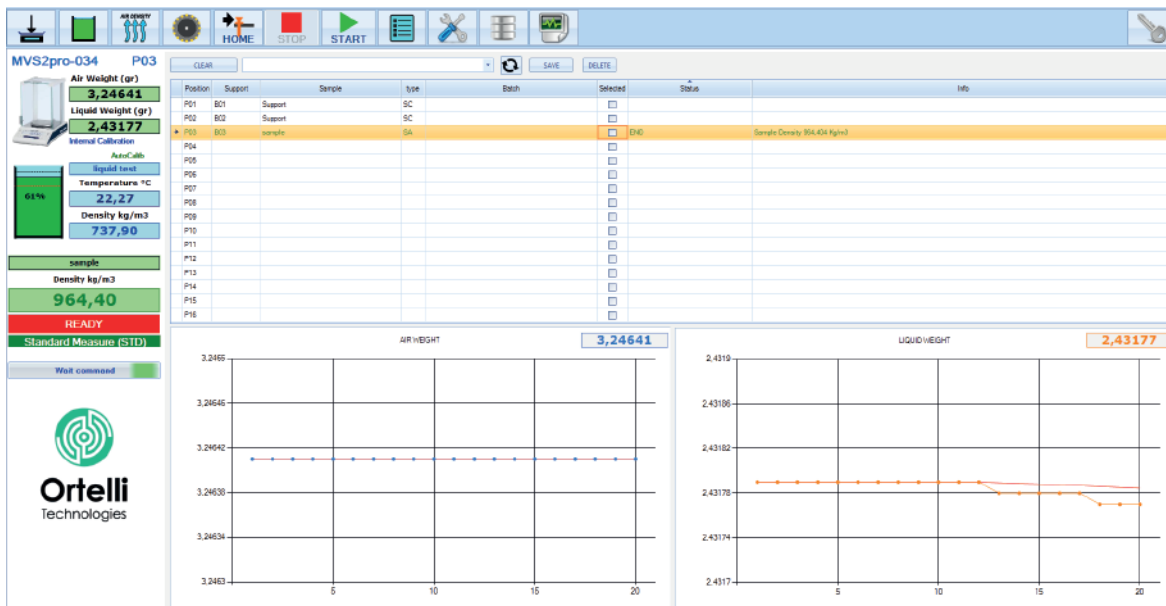
Fully automated sequence reading, including control tests and correct detection of measured parameters.
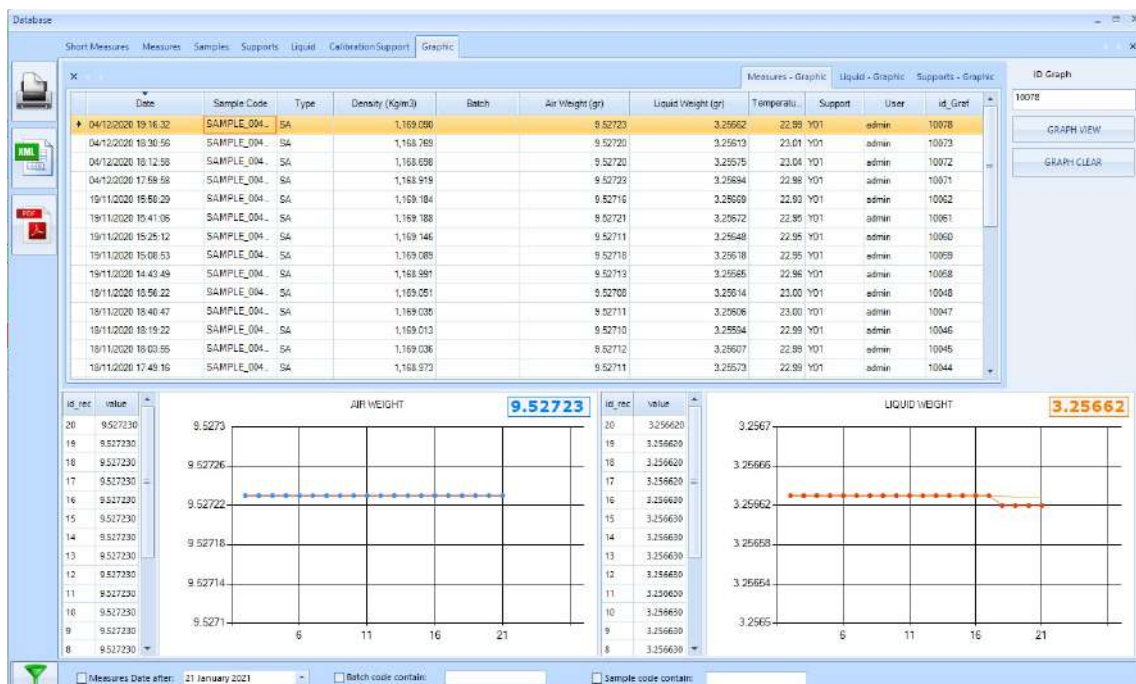
Control of all the set up and all the data analysis phases stored in the software database, including the graphs of the data taking in air and liquid.
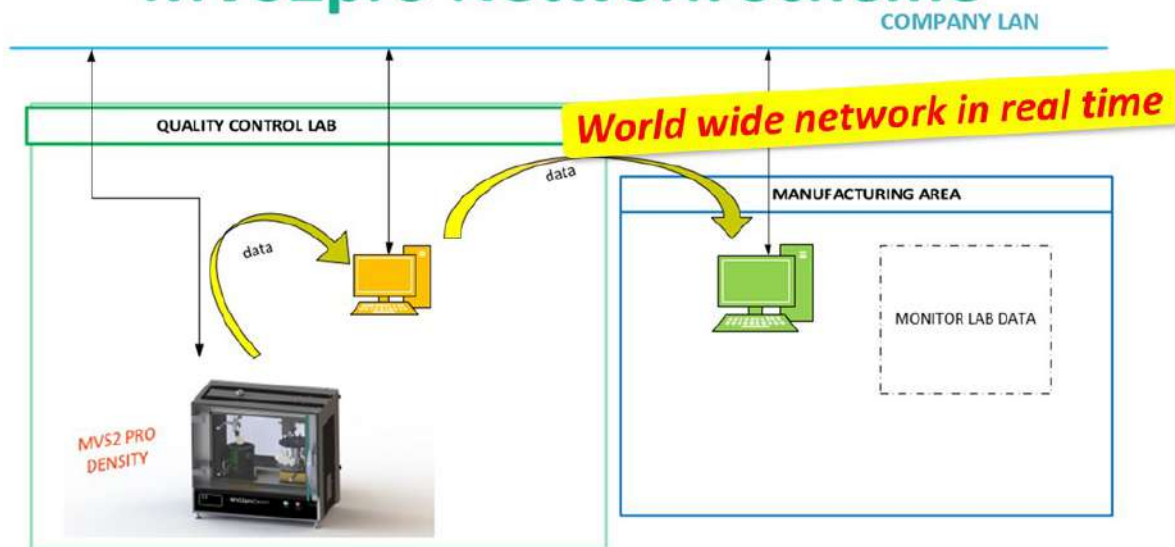
FDA CFR 21 part 11 compliant

MVS2pro's software is compliant to the Food and Drug Administration's (FDA's) 21 CFR Part 11. This FDA's part is related to a strict control on **Electronic Records** and **Electronic Signatures**.

USER:
PASSWORD:

4.0 Transitional Plan

The system can be fully integrated within the corporate LAN with the ability to transfer analytical data to the areas of competence identified automatically.
Anyone in your company can access with his own account and **see all the data they are authorized to see in REAL-TIME wherever you are in just one click**.
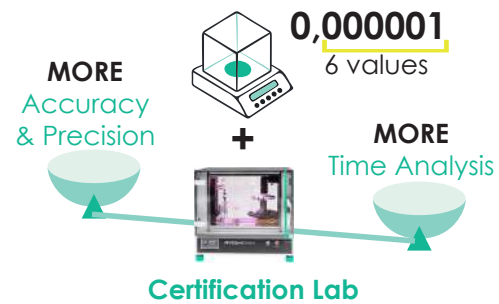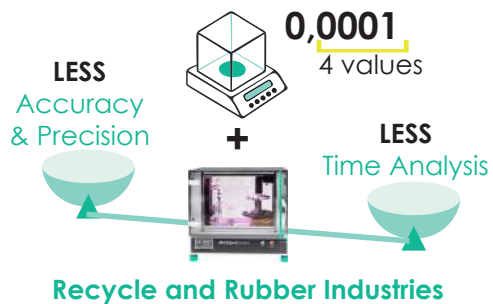
System configuration adaptable

Accuracy & Precision

Time Analysis

High custumization

0,0001
4 values

LESS Accuracy & Precision
+
LESS Time Analysis

Recycle and Rubber Industries

0,000001
6 values

MORE Accuracy & Precision
+
MORE Time Analysis

Certification Lab

Taylor-made MVS2pro systems: The Ortelli Technologies invented such an advanced system that is able to module its accuracy and precision measurement level, according to whatever customer's needs. Thanks to a huge range of balance combinations possibility.

Online demonstration

Virtual Room for Demo Live Webinar
and custom demonstration on demand!

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Were we are around the World

We are present **ALL AROUND THE WORLD** with many Ortelli Technologies dealers.

Contact us directly and we will redirect you to the authorized Ortelli Technologies reseller closest to you!

📍 *Headquarters*

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Watch the video