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GSA-1

Grain Size Analyzer

60.50.512 – Ed. 1 – 12/03/2012

All the information given in this manual is what available at the time of printing.
The manufacturer reserves the right to make changes to the product at any time without notice.
It is advisable to verify if there are any updates.

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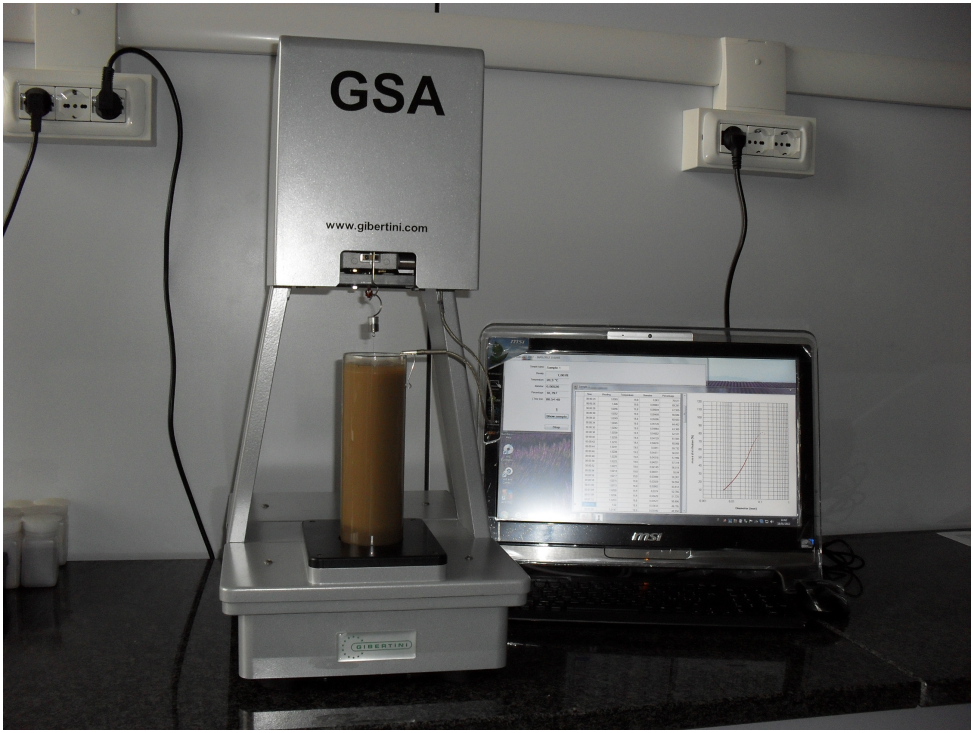
GRAIN SYZE ANALYZER GSA-1



1. A NEW INSTRUMENT FOR PARTICLE-SIZE ANALYSIS

GSA (Grain Size Analyzer) allows particle size characterization of soils by measuring the progressive reduction of density in a soil suspension, following particle sedimentation during a given standard time of observation. This instrument makes use of the procedure prescribed by ASTM D422 standard norms applied to a modified hydrostatic balance for measuring density rather than by utilising standard 151H or 152H hydrometers.

In order to assess the correctness of this method, various comparative tests were carried out using the 152h standard hydrometer, according to the ASTM D422 norms, and GSA, the latter both in the 1000 ml and 500 ml version. Considering the different capacity of the two vessels, the amounts of material used were proportionally adjusted. The dispersing agent utilised is sodium hexametaphosphate at 40‰ concentration in a mixture of 125 ml of Na + 875 ml of distilled water for the 1000 ml GSA – as recommended by the standard norms – whereas for the 500 ml GSA these values were proportionally reduced to 62 ml of Na + 438 ml of distilled water. The hydrometer particle size test was carried out by acquiring data at 1, 2, 4, 8, 16, 30, 60, 120, 240, 480, 1440 minutes, respectively, whereas GSA makes use of an automatic method for continuous data acquisition.

Particularly the GSA-1 measures the finer fraction of soil from 0,1 to 0,001mm a complete analyse takes 5/6 hours.

All tests were carried out in order to verify several aspects:

- correspondence between the two methodologies
- assessment of the effects of the reduction of the volume of suspension utilised
- assessment of the effect of the vessel bottom on particle size distribution
- assessment of the sand fraction
- repeatability of the tests

2. STANDARD ACCESSORIES

- 2 VESSELS with 500ml reference
- 2 triangular magnets for stirrer agitation
- 1 magnet retriever
- 2 floaters of 20ml
- 1 kit with pan and weight of 100g
- Cable RS232 for PC code 2300415

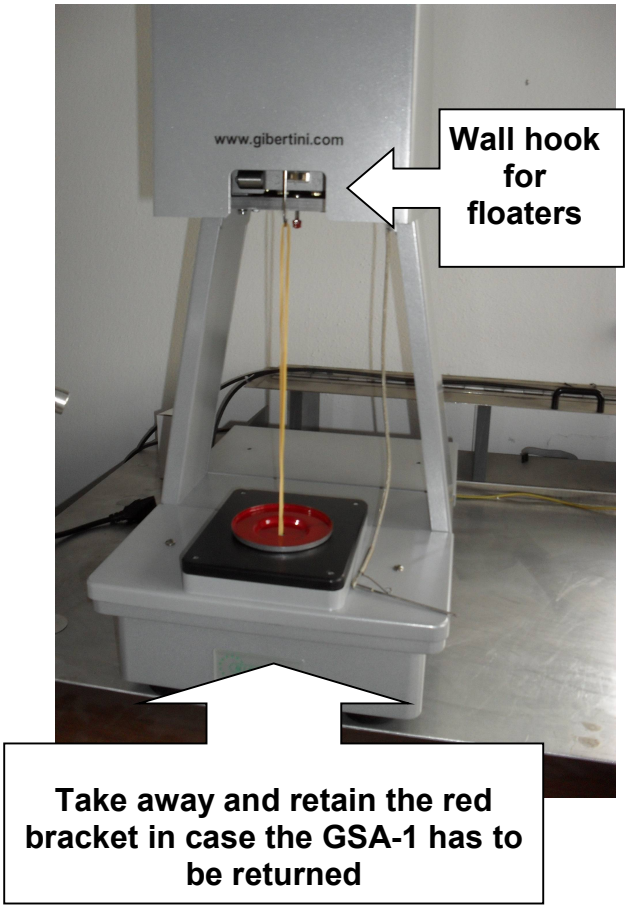
3. TECHNICAL MAIN CHARACTERISTICS

- Dimensions (W x D x H): 300 x 450 x 650 mm
- Weight: 17 kg
- Range of density from 0,9000 to 1,0500 accuracy 0,0001
- Automatic compensation of variation of the temperature and Stokes law
- Repeatability better than 2%

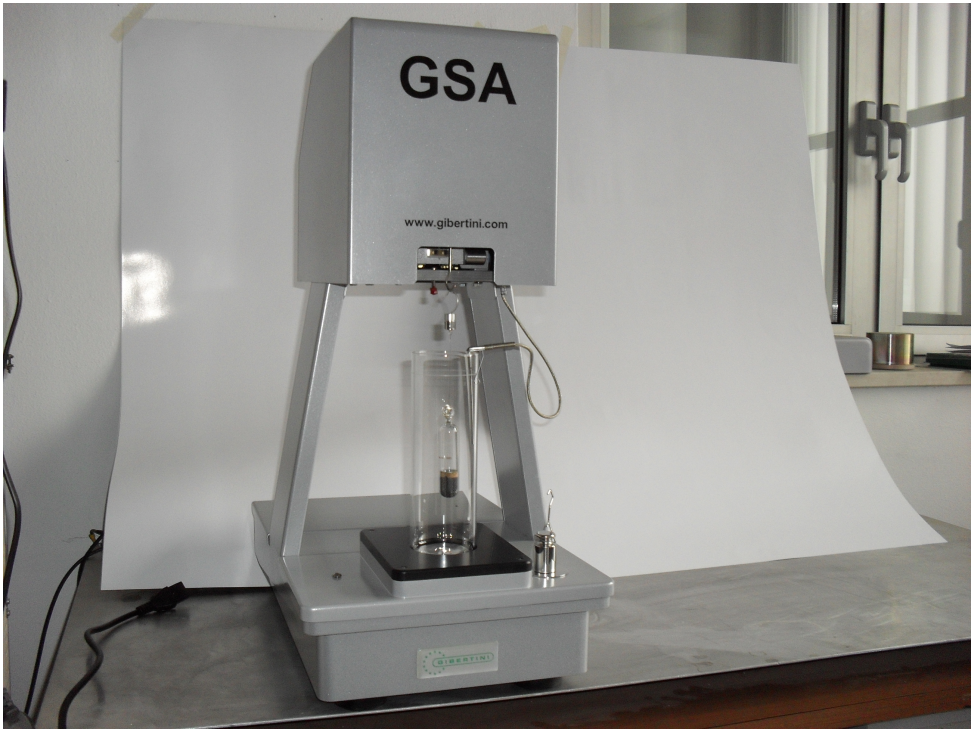
POWER SUPPLY 230V – 1AMP

4. INSTALLATION

Choose an appropriate location taking into account these criteria:
Vibrations and air drafts in the ambient must be avoided.
The supporting stand must be rigid.
The mains line must be stable. It is not advisable to use the same electric line of the fluorescent lamps or other electric apparatus which can be switched on and off randomly, 230v – 1amp.
The balance must be kept far from magnetic fields.
Environmental conditions with wide temperature changes must be avoided.



Insert the power supply 230V cable located at the REAR and SWICTH ON – SIGNALED by the LED in FRONT



5. TO PERFORM SAMPLE – 500 ml

- 25g of soil
- 62 ml of dispersing agent sodium hexametaphosphat at 4%
- Distilled water till 500ml
-

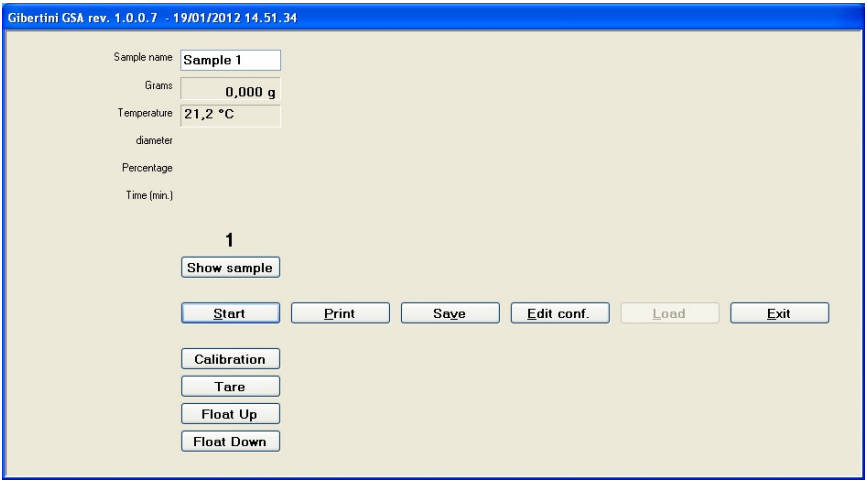
6. STANDARD PARAMETERS

- Density of soil: 2,65 g/cm3
- Gravity: 9,81 m/s^2
- Sample: 25,00 g
- Barycentre: 80 mm

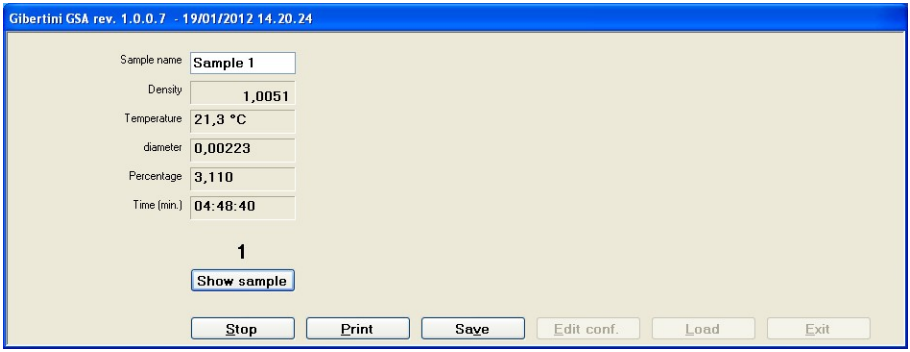
Special pan and mass 100g to calibrate the GSA-1

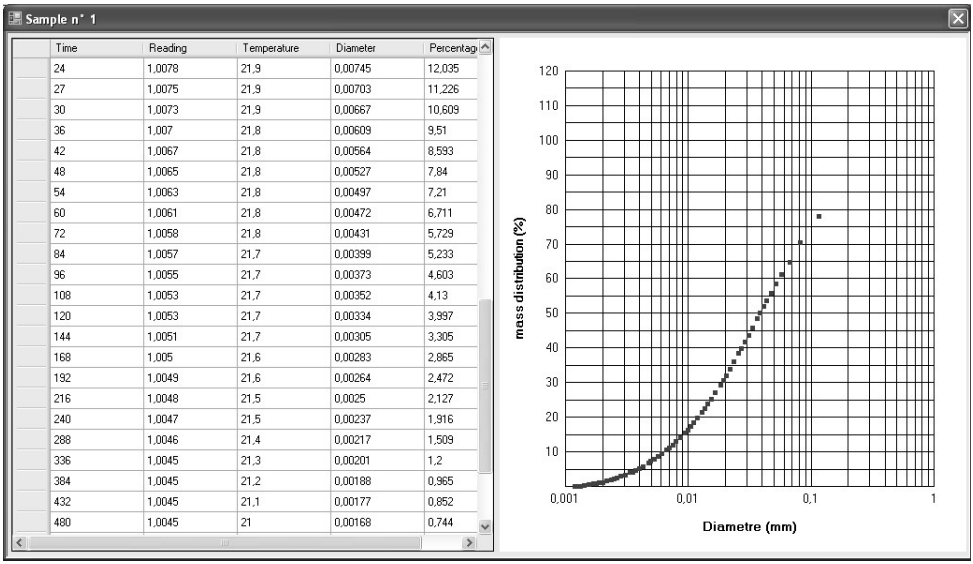
7. THE START OF GSA-1

Set up the software through GSA MultiHead shows all the functions.



To click START the STIRRER STARTS and the test is beginning.

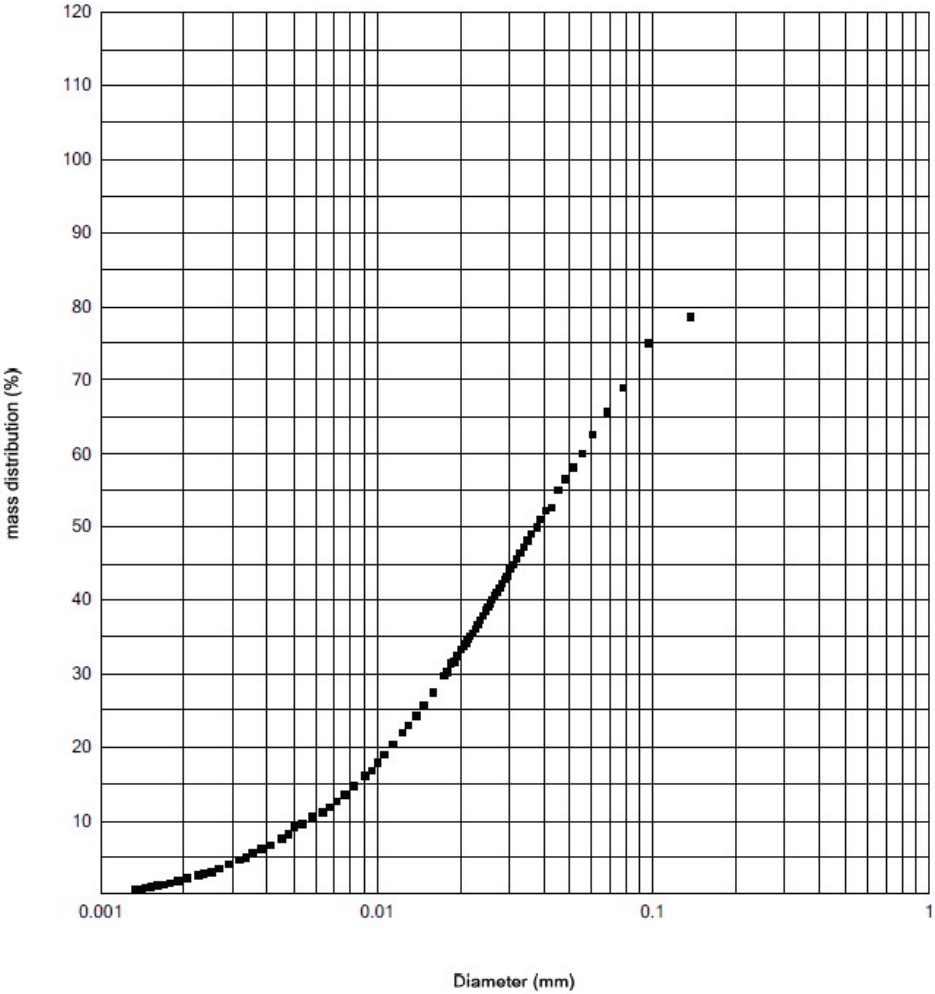




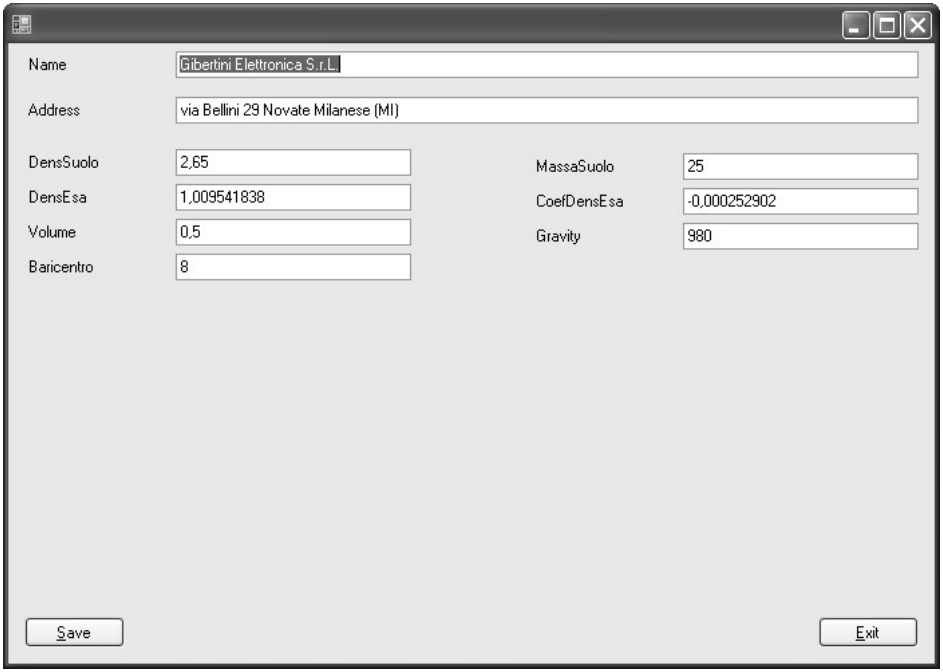
Time	Reading	Temperature	Diameter	Percentagi
24	1,0078	21,9	0,00745	12,035
27	1,0075	21,9	0,00703	11,226
30	1,0073	21,9	0,00667	10,609
36	1,007	21,8	0,00609	9,51
42	1,0067	21,8	0,00564	8,593
48	1,0065	21,8	0,00527	7,84
54	1,0063	21,8	0,00497	7,21
60	1,0061	21,8	0,00472	6,711
72	1,0058	21,8	0,00431	5,729
84	1,0057	21,7	0,00399	5,233
96	1,0055	21,7	0,00373	4,603
108	1,0053	21,7	0,00352	4,13
120	1,0053	21,7	0,00334	3,997
144	1,0051	21,7	0,00305	3,305
168	1,005	21,6	0,00283	2,865
192	1,0049	21,6	0,00264	2,472
216	1,0048	21,5	0,0025	2,127
240	1,0047	21,5	0,00237	1,916
288	1,0046	21,4	0,00217	1,509
336	1,0045	21,3	0,00201	1,2
384	1,0045	21,2	0,00188	0,965
432	1,0045	21,1	0,00177	0,852
480	1,0045	21	0,00168	0,744

It is possible to save the data “CSV” to convert in OPEN OFFICE or EXCEL.

	PRINT
Percentage of SAND > 50 µ	**45,0**
Percentage of SILT 50/20 µ	**24,7**
Percentage of SILT 20/2 µ	**28,7**
Percentage of CLAY < 2 µ	**1,6**



This MENU' allows the modification of the standard parameters ask GIbertini Elettronica.



ATTENTION !
DO NOT MODIFY THE INTERNAL PARAMETERS WITHOUT PERMISSION OF GIBERTINI ELETTRONICA.

ÉLIMINATION – INFORMATION AUX UTILISATEURS

Selon les directives 2002/95/CE, 2002/96/CE et 2003/108/CE, au sujet de la réduction de l'utilisation des substances dangereuses dans les appareils électriques et électroniques, aussi bien que l'élimination des déchets.

Le symbole d'une boîte croisée appliquée sur l'appareil ou sur l'emballage indique que le produit doit être collecté séparément des autres déchets à la fin de sa vie utile.
La collecte séparée de ce appareil qui a atteint la fin de sa vie utile est géré et organisé par le producteur. L'utilisateur qui désire se débarrasser de l'appareil doit donc contacter le vendeur et suivre les instructions données.
La collecte appropriée des déchets séparée pour le futur envoi de l'appareil hors d'usage pour le recyclage, le traitement et l'élimination environnementalement compatible, contribue à prévenir tous les effets négatifs possibles sur le environnement et sur la santé, et encourage la réutilisation et le recyclage des matériaux dont l'appareil est constitué.
La disposition non autorisée du produit par l'utilisateur comportera le paiement des sanctions administratives en vigueur dans le pays où l'appareil a été mise sur le marché.