



- ❖ **TOTALLY INDIGENOUS & MOST ECONOMICAL**
- ❖ **COMPUTER CONTROLLED**
- ❖ **MEETS USP / INTERNATIONAL STANDARDS**
- ❖ **SPECIAL 21 CFR PART 11 COMPLIANCE SOFTWARE**

Surface Area is an intrinsic property of powdered porous materials that can reveal important information regarding the usefulness of a material for an application. Surface area plays critical role in the bio-availability of Pharmaceuticals, dispersion of dyes, adsorption capacity of carbon and many more.

By means of Physical adsorption, Surface Area can be calculated since physically adsorbed molecules are not restricted to specific sites and are free to cover the entire Surface. This process is reversible. Typically nitrogen gas is adsorbed at cryogenic temperatures (liquid nitrogen). Based on the amount of gas adsorbed (adsorbate) at a given pressure, the BET equation is used to calculate the number of adsorbed gas molecules that would be required to form a monolayer on the surface. With knowledge of the cross - sectional area of the gas molecule adsorbed, the Surface Area can be easily calculated.

Description :

Smart Sorb 93, Surface Area Analyser is based on dynamic BET principle. Nitrogen gas is used for adsorption. The dynamic flow method uses a high sensitive thermal conductivity detector to measure the change in the concentration of an adsorbate / carrier gas mixture during adsorption or desorption process. It determines the surface area at single point and it can be enhanced for measuring multi point surface area and total pore volume analysis with different gas mixture percentage. The user-friendly software stores the data and computes the final surface area value. On line adsorption, desorption curves are displayed on the screen.

Specifications :

- ◆ Surface Area range - 0.1 m²/gm to 1500 m²/gm - Normal. Extendable up to 2500 m²/gm.
- ◆ Accuracy - Typically better than ± 5%
- ◆ Reproducibility - Typically better than ± 3%
- ◆ Sample Holder - Typical Sample holder capacity 7 ml Bigger sizes are available
- ◆ Dimensions - 45 cm (L) 25cm (B) x 35 cm (H)
- ◆ Weight - 10 Kg.
- ◆ Electrical - 230 V AC, 50 HZ
- ◆ Regeneration System -
 - ❖ Temperature Range : Ambient to 300°C
 - ❖ Accuracy : Better than ± 5°C of Set Point
- ◆ Operating temperature - 15°C to 40°C (non condensing)

Features :

- ◆ Wide Range of Surface Area Measurement
- ◆ Easy to use with direct display of Surface Area after completion of analysis on computer
- ◆ High Speed Analysis - within 10-15 minutes
- ◆ Meets USP-824, EP/BP, ASTM D 6556-14, ISO 4652, IS 2752 standards
- ◆ Special Software is available which complies with 21CFR Part 11
- ◆ High Accuracy and Reproducibility
- ◆ Built in micro-controller permits to use the instrument in manual mode
- ◆ Utilizes a modified BET equation for Single Point Surface Area determination
- ◆ Ultra stable detector eliminates drift and need for constant readjustment
- ◆ Separate regenerating system for sample preparation is provided which degas three samples at a time
- ◆ Total pore volume and multipoint Surface Area determination is possible with additional gas mixtures
- ◆ Surface area range selection for Low Surface Area to High Surface Area

Operation of Smart Sorb :

Samples are degassed at suitable temperature in the separate regeneration system before doing the analysis. Sample tube is sealed to avoid further exposure. Seals are removed and tube is immediately connected to the analysis station. Mixture of Helium and Nitrogen gas is passed over the sample. The sample tube is then dipped in liquid nitrogen filled in the dewar flask. This leads to adsorption, which is automatically detected by software. After completion of adsorption process, software indicates and dewar flask is removed. The sample tube is then dipped in water. This initiates desorption process. The desorption signal is displayed on the digital meter along with its integrated counts. The online graph is plotted for adsorption as well as desorption process. After completion of desorption process, the software instructs to inject pure nitrogen for calibration purpose. All the data points are stored in a file, which is then extracted to display the final report and graph.

Based on BET theory, the final surface Area of the sample is calculated by measuring the monolayer volume of nitrogen gas adsorbed at atmospheric pressure and it's cross sectional area. Specific surface Area is calculated by dividing this value by sample's weight.

Windows Based Software :

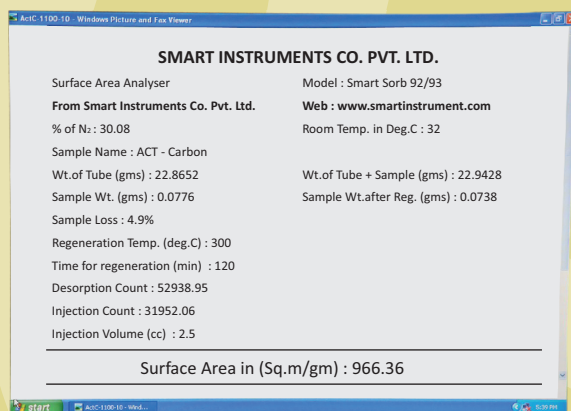
Smart Sorb 93 is micro-controller based and communicates with Windows 7, 8 or 10 based PC through serial communication.

The software is very simple and user friendly. It guides the operator as the analysis proceeds. Unique sample batch number is given to every sample, which can be browsed in the 'Report' option. After the analysis is over, the report can be viewed and printouts can be taken.

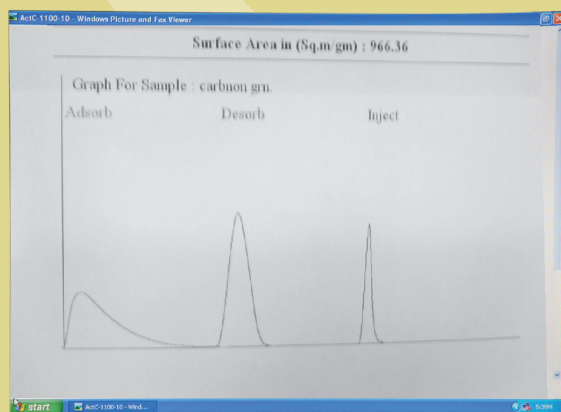
Special 21 CFR Part 11 complies software have many features such as user login, user privileges, audit trail, etc. Single point and Multipoint analysis can be performed.

Analysis Report :

A tabular report and online graph for adsorption, desorption are provided. In tabular report, all the experimental parameters along with single point surface area value is printed.



Adsorption / desorption data points are stored and it can be viewed by using Smart Sorb Software.



Sample Preparation :

For getting proper Surface area value, the sample's surface should be cleaned. To remove the contaminants, the sample is heated at suitable temperature. Actual temperature is displayed on the digital display. Set point temperature can be adjusted by knob.

Applications :

For Quality Control and Research Laboratory -

- ◆ Catalysts for automotive, fertilizers and petrochemical industries
- ◆ Carbon for rubber, adsorbents (gas separation and water purification), gas masks, inks, laser printers etc
- ◆ Minerals such as alumina, clays, pigments, phosphates, silica, zirconia etc used for abrasive, adsorbents, biomaterial, ceramics, cement, desiccants, fillers, paper and paints. Zinc Oxide used in rubber industry
- ◆ Organic material for adhesive, foodstuffs, chromatography, resins, cosmetics, explosives, ion exchange, plastics and pharmaceuticals
- ◆ Powdered metals and ferrites for batteries, pressure formed / sintered products

Main Accessories supplied :

- ◆ Sample Tubes
- ◆ Powder funnel
- ◆ Dewar flask with SS Jali
- ◆ Spare O rings, septum, stoppers
- ◆ Hamilton make Gas Tight Syringe
- ◆ Supporting Boxes

Optional Accessories :

- ◆ Purging arrangement for three samples while heating
- ◆ Cryogenic Container 10 litre capacity
- ◆ Gas mixture cylinder with regulator
- ◆ Gas Manifold with Purification Panel for Multipoint Analysis.



Our Other Product Range

- **True Density Meter**
- **Tap Density Meter**
- **Digital Gas Flow Meter**

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