

SAPSA-3400

High-Throughput BET Surface Area and Pore Size Analyzer



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

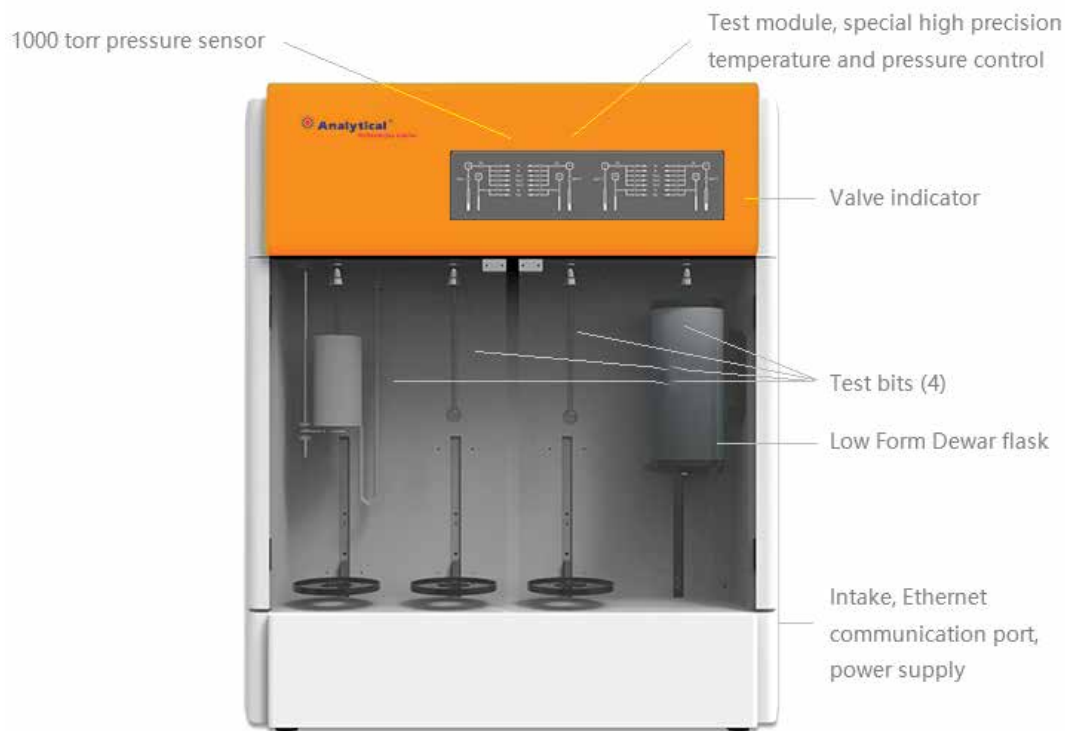
Analytical Technologies Limited

An ISO 9001 Certified Company

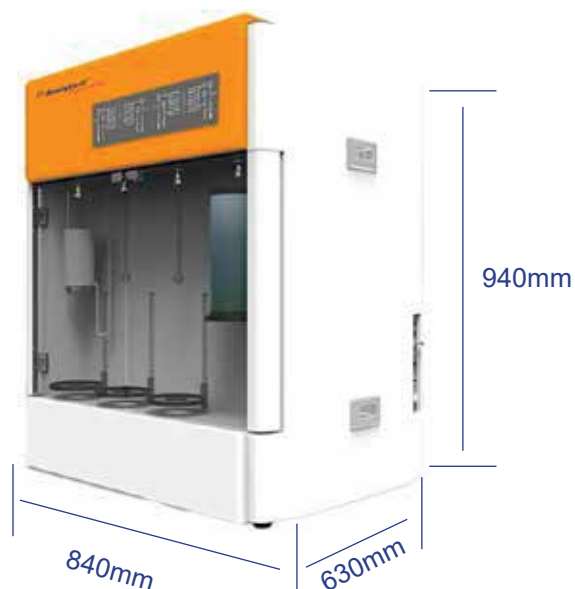
www.analyticalgroup.net

►► Outline

The SAPSA 3400 is a compact sorption analyzer with four completely independent analysis stations for the determination of BET surface area, total pore volume and pore size distributions of mesoporous and macroporous materials. Each analysis station can be programmed individually and started at any given time. This is achieved by four independent dosing volumes and without any time loss. Next to Nitrogen, it is possible to employ any non-corrosive gas as an adsorbate such as CO₂, Ar, Kr, H₂, O₂, CO, NH₃ or CH₄. All four analysis stations can also be used as in-situ degassing stations for sample preparation.



Structural distribution diagram



►► Features

Test Module

Internal temperature of test module can be controlled through Real-time monitoring, ensuring accuracy of adsorption detection.

Saturated Vapor Pressure P0

Using independent P0 pressure sensor for P0 value by inching test, guarantees the reliability of experimental data. Atmospheric pressure input method to determine P0 also be selected.

p0 *	103.94	kPa	<input type="checkbox"/> Auto
p/p0 max *	0.99		

Vacuum System

It's a multi-channel, adjustable, and parallel vacuum system. Vacuum degree of this system can be controlled in segments. This design prevents the sample from being pumped into analyzer. Meanwhile, a delicate part was designed for ensuring cleanliness of vacuum system, minimizing dust pollution.

Sample Preparation System

It's optional. External sample preparation device with four-degas stations in vacuum and heat to remove air from surface and pores of samples.

Temperature can be set and monitored individually and controlled from ambient to 400 °C.

Pressure Sensor

A high-precision capacitive thin film pressure sensor, makes the partial pressure of P/P0 up to 10^{-4} (N₂/77K) in the physical adsorption analysis.

Cold Free Space

Cold free space can be corrected by Helium automatically, ensuring accuracy of test results. This calibration method is suitable for testing of any powder or particle material.

Control of Liquid Nitrogen level

Using High volume (3L) Dewar flasks and working with the seal cover assure a constant thermal profile along the length of sample tubes and P0 tubes throughout testing process.

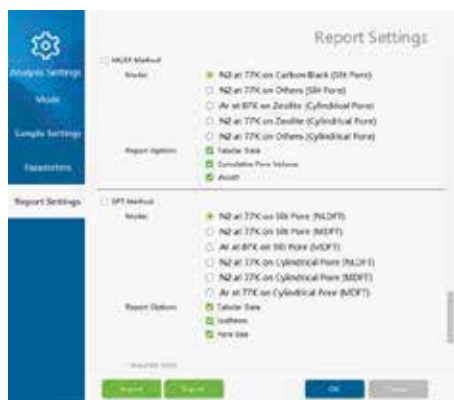


►► Control and Analysis Software

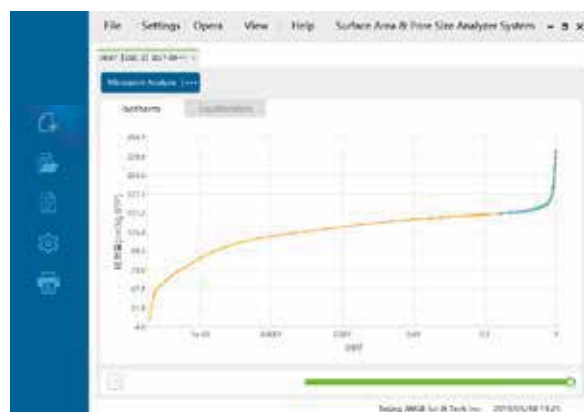
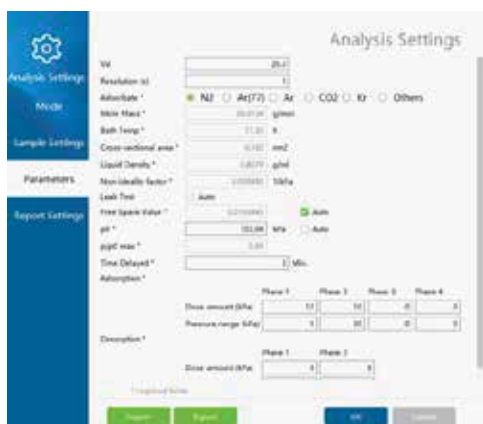
Software is intelligent software in operation control, data acquisition, calculation and analysis and report generation on the Windows platform. This software can communicate with the host through the LAN port and remotely control many instruments at the same time.

Clear tabular reports include:

- Adsorption and desorption isotherms
- Single-/Multipoint BET surface area
- Langmuir surface area
- STSA-surface area
- pore size distribution according to BJH
- t-plot
- Dubinin-Radushkevich
- Horvath-Kawazoe
- Saito-Foley



Software adopts a unique intake control method, the pressure in adsorption and desorption process is optimally set in six-stage; this flexible design is helpful for improving test efficiency.



Changes of the pressure and temperature inside the manifold can be observed directly in the test interface which is convenient for sample test and instrument maintenance.

Current state of analyzer can be intuitively understood with the indicator light and event bar. Each adsorption equilibrium process is dynamically displayed on the test interface. Adsorption characteristics of the sample can be easily understood.

►► Typical analysis examples

BET repeatability is only $0.0015 \text{ m}^2/\text{g}$ in the test of very low surface area powder

ID	Pd	Pcd	P/Po	V	R	Time
2	10.57665	6.49165	0.06368	0.05149	1.32095	16:39:04
3	14.47043	10.49325	0.10300	0.05714	2.00944	16:40:34
4	20.49214	15.55271	0.15266	0.06328	2.84716	16:42:08
5	26.25142	20.97835	0.20608	0.06958	3.73044	16:43:45
6	31.09524	26.11512	0.25661	0.07540	4.57787	16:45:24
7	36.21625	31.26206	0.30719	0.08122	5.45905	16:47:06

Slope	Intercept	V _m	C	C _c
16.90313	0.25562	0.05828	67.12578	0.99997

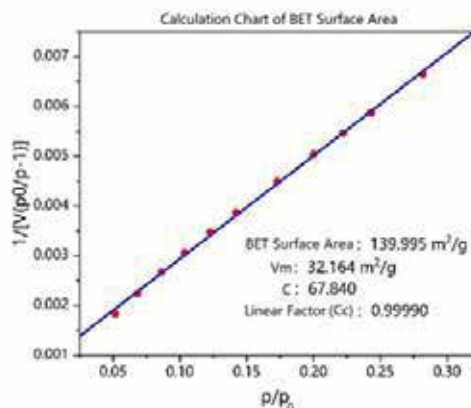
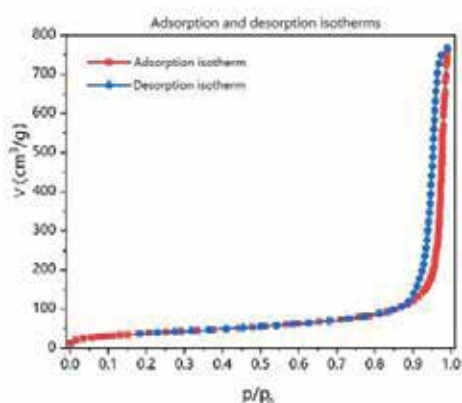
Specific surface area (m^2/g): 0.25410

ID	Pd	Pcd	P/Po	V	R	Time
2	11.12797	7.02669	0.06872	0.05193	1.42099	14:21:24
3	15.08480	11.06897	0.10834	0.05767	2.10708	14:22:55
4	21.71276	16.45800	0.16109	0.06420	2.99078	14:24:29
5	27.29098	21.94468	0.21492	0.07083	3.86529	14:26:07
6	32.00053	27.05703	0.26512	0.07653	4.71376	14:27:46
7	37.32853	32.26907	0.31619	0.08262	5.59644	14:29:28

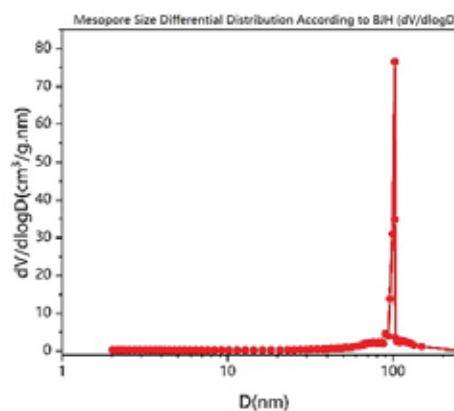
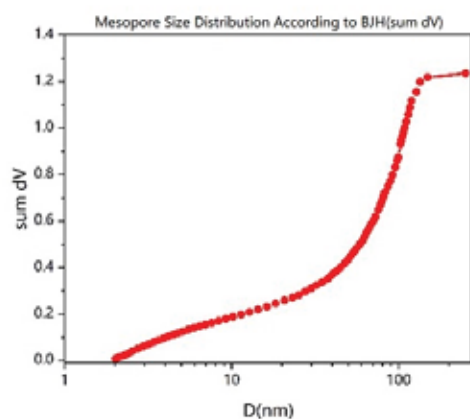
Slope	Intercept	V _m	C	C _c
16.78425	0.27576	0.05862	61.86487	0.99996

Specific surface area (m^2/g): 0.25557

Analysis value of pore size distribution in activated carbon materials as follows:



Microporous analysis Report of carbon materials as below:



►► Specifications

Feature	3400A
Adsorbed Gas	Non corrosive gases, such as N ₂ , Ar, Kr, H ₂ , O ₂ , CO ₂ , CO, NH ₃ , CH ₄ , etc.
Pressure Sensor at Analysis Station	Accuracy: ±0.15% (F.S.)
Analysis Station	Each analytical station is equipped with a pressure sensor.
Degas System	The standard configuration is 4 stations in-situ degassing, which can simultaneously degas 4 samples with heating in vacuum; External sample preparation device with four-degas stations.
Degas Temperature	Ambient to 400 °C. Free to set up target temperature.
Cold Trap	1
Vacuum Pump	Two-stage rotary vane mechanical vacuum pump, the ultimate pressure is 6.7*10 ⁻² Pa
Analysis Port	Samples at four analysis ports can be tested at the same time.
Test Principle	Gas adsorption by static-volumetric analysis
Measurement Range of Specific Surface Area	0.0005 m ² /g to the infinity; Standard sample repeat accuracy is less than ± 1.0%
Test Range of Pore Diameter	Repeatability of pore size is less than 0.2 nm in the accurate analysis of porous materials which size is more than 2 nm.
Minimum Pore Volume	0.0001 cm ³ /g
Range of Relative Pressure P/P₀	10 ⁻⁴ -0.998
Overall Dimension	Depth: 840 mm; width: 630 mm; height: 940 mm; weight: 85kg
Ambient Temperature	15-40 °C
Related Humidity	30%-60%
Electrical Supply	AC220 V ± 20 V, 50/60 HZ, maximum power 300W;

►► Applications

Applied Field	Typical Materials	Details
Material Research	ceramic powder, metal powder, nanotube	According to surface area value of nanotube, hydrogen storage capacity can be predicted.
Chemical Engineering	carbon black, amorphous silica, zinc oxide, titanium dioxide	Introduction of carbon black in rubber matrix can improve mechanical properties of rubber products. Surface area of carbon black is one of the important factors affecting the reinforcement performance of rubber products.
New Energy	lithium cobalt, lithium manganate	Increasing surface area of electrode can improve Electrochemical reaction rate and promote iron exchange in negative electrode.
Catalytic Technologies	active alumina oxide, molecular sieve, zeolite	Active surface area and pore structure influence reaction rate.

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

AMC's/CMC :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufacturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

Our Products & Technologies



UV/VIS
Spectro 2080+
Double Beam



Infra FTIR



Optima Gas
Chromatograph
3007



Optima Gas
Chromatograph
2979 Plus



Flash
Chromatograph



Atomic Absorption
Spectrophotometer



Liquid Particle
Counter



Optical Emission
Spectrophotometer



DSC/TGA



Semi Auto Bio
Chemistry Analyzer



HEMA 2062
Hematology
Analyzer



Micro Plate
Reader/Washer



URINOVA 2800
Urine Analyzer



Total Organic
Carbon 3800



Fully Automated
CLIA



NOVA-2100
Chemistry Analyzer



PCR/Gradient PCR/
RTPCR



TOC
Analyzer



Laser Particle
Size Analyzer



Ion Chromatograph



Water purification
system

Regulatory compliances



Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:



Analytical
Foundation

1. Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personalities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

Reach us @



 **Analytical**[®]
Technologies Limited

HPLC Solutions MultipleLabs Analytical Bio-Med Analytical Distributors Analytical Foundation (Trust)

Corporate & Regd. Office:
Analytical House, # E67 & E68,
Ravi Park, Vasna Road, Baroda,
Gujarat 390 015. INDIA

T: +91 265 2253620
+91 265 2252839
+91 265 2252370
F: +91 265 2254395

E: info@hplctechnologies.com
info@multiplelabs.com
info@analyticalgroup.net
info@analyticalbiomed.com

W. www.analyticalgroup.net
www.hplctechnologies.com
www.multiplelabs.com
www.ais-india.com

Sales & Support Offices:
across the country :
Distributors & Channel
partners World Wide