

# ASAP 2020 HD

## High Definition Accelerated Surface Area and Porosimetry Analyzer

- Improved isotherm resolution and accuracy
- Wider pressure measurement capabilities
- Current ASAP 2020 users can upgrade to the new HD standard
- Largest library of adsorptive properties commercially available
- Largest library of DFT/NLDFT models commercially available
- Adsorption and desorption analysis using a wide variety of adsorptives
- Determine microporosity and evaluate the hydrogen, methane or CO<sub>2</sub> storage capacity of materials
- Micropore size and volume can easily be obtained on MOFs, activated carbons, and zeolites
- Chemisorption option has proprietary temperature control
- Upgrade to allow the use of hydrocarbons or water vapor for sorption studies



Micromeritics introduces the new ASAP 2020 HD which includes many features that offer improved isotherm resolution and accuracy. Current ASAP 2020 users can also benefit from these new capabilities by upgrading their instrument to the new HD standard.

Wider pressure measurement capabilities for the ASAP 2020 HD allow isotherm measurements to start an order of magnitude lower in pressure than previous ASAP instruments. This new low pressure capability provides more resolution and new options for materials with micropores like metal organic frameworks, activated carbons, and zeolites. Extending the pressure range reduces the isotherm variations often observed with adsorptives like nitrogen. The new Hi-AC technology (Higher resolution Adsorbed phase Calculations) will

benefit all users whose characterization needs require precision and the use of a wide variety of adsorptives (probe molecules). These calculations combine the use of existing Micromeritics technology with real gas properties of the adsorptive. Hi-AC features the precision fluid properties developed by the National Institute of Standards and Technology combined with rigorous free-space control, the real gas equation of state, and compensation for the dynamic void space.

The ASAP 2020 HD also includes the largest library of adsorptive properties of any commercial gas adsorption analyzer. The adsorptive properties library allows users to conveniently select new probe molecules without the worries or difficulties of finding fluid property data. The adsorptive properties library provides the Hi-AC method with all fundamental

fluid properties in high resolution. The user also has the convenience of high resolution with the click of a button.

Micromeritics pioneered the use of DFT/NLDFT (Non-local Density Functional Theory) in commercial instruments, recently introducing a series of next-generation finite NLDFT models. With the most comprehensive library of DFT/NLDFT models for textural analysis, the current Micromeritics library includes more than 20 models that cover a range of materials, geometries, and adsorptives. Micromeritics instrument users can select a model that best describes their material.

Material synthesis continues to evolve at what seems to be an exponential pace. This rapid expansion of new materials presents new challenges for characterization. To meet these needs,

the ASAP 2020 HD now provides new low pressure desorption capabilities. Low pressure desorption analysis will be beneficial to material scientists who synthesize materials that exhibit adsorbed phase changes during desorption. Metal organic frameworks and small pore zeolites often exhibit low pressure hysteresis during desorption. The new low pressure desorption analysis will provide more resolution for these materials that “breathe”.

The ASAP 2020 HD upgrades the chemisorption option with proprietary temperature control. Analytical instruments often require rapid and precise temperature control beyond what is available with common PID controllers. The ASAP 2020 HD includes Micromeritics proprietary temperature control algorithms. This new temperature control provides benefits across the entire temperature range on the ASAP 2020 HD, the largest benefit being improved precision near ambient temperature where it is often the most difficult to control temperature.

## Pressure Measurement Specifications

<b>Range:</b>	0 to 950 mmHg
<b>Resolution:</b>	
1000-mmHg Transducer	0.001 mmHg (Analysis system) 1 mmHg (Degas system)
10-mmHg Transducer*	0.00001 mmHg
Options for high stability:	
1-mmHg Transducer**	0.000001 mmHg or
0.1-mmHg Transducer***	0.0000001 mmHg
<b>Accuracy</b> (Analysis system only):	
Includes nonlinearity, hysteresis, and nonrepeatability. Transducer manufacturer’s specifications.	
1000-mmHg Range	Within 0.15% of reading
10-mmHg Range*	Within 0.15% of reading
1-mmHg Range**	Within 0.12% of reading
0.1-mmHg Range***	Within 0.15% of reading

\* High Vacuum systems, \*\*Micropore systems, \*\*\*Micropore with 0.1 torr transducer

*In keeping with a policy of ongoing product improvement, specifications are subject to change without notice.*