

Technical Capability

MEASUREMENT	INSTRUMENTS USED
Surface Area using Nitrogen	Autosorb, Nova, Quadrasorb, Monosorb
Surface Area using Krypton	Autosorb, Quadrasorb, Monosorb
Pore Volume, Pore Size and Pore Size Distribution	Autosorb, Nova, Quadrasorb
Chemisorption	Autosorb-1C, ChemBET Pulsar
Pore Volume, Pore Size, Pore Size Distribution by Mercury Porosimetry	PoreMaster
True Density, Open- and Closed Cell Content by Helium Pycnometry	Ultrapycnometer, MicroUltrapyc
Tapped Packing Density/Bulk Density	Dual Autotap, PoreMaster
Sampling	Sieving Riffler, Microroffler
Particle Size Distribution by Laser Diffraction, Wet or Dry	Particle Size Analyzer
Zeta Potential	Zeta Reader

ASTM: Surface Area

Number:	Title
C 1274-00 (2006)	Standard Test Method for Advanced Ceramic Specific Surface Area by Physical Adsorption
C1251-95	Standard Guide for Determination of Specific Surface Area of Advanced Ceramic Materials by Gas Adsorption (withdrawn 2000)
C 1069-86(2004) e1	Standard Test Method for Specific Surface Area of Alumina or Quartz by Nitrogen Adsorption
D-1993-03	Standard Test Method for Precipitated Silica - Surface Area by Multipoint BET Nitrogen Adsorption
D5604-96(2006)	Standard Test Methods for Precipitated Silica - Surface Area by Single Point B.E.T. Nitrogen Adsorption
D6556-07	Standard Test Method for Carbon Black-Total and External Surface Area by Nitrogen Adsorption
D-4820-99	Standard Test Methods for Carbon Black Surface Area by Multipoint B.E.T. Nitrogen Adsorption (withdrawn 2000)
D-5816-99	Standard Test Methods for Carbon Black - External Surface Area by Multipoint Nitrogen Adsorption (withdrawn 2000)
D3037-93	Standard Test Methods for Carbon Black - Surface Area by Nitrogen Adsorption (withdrawn 1999)
D4567-03(2008)	Standard Test Method for Single-Point Determination of Specific Surface Area of Catalysts and Catalyst Carriers Using Nitrogen Adsorption by Continuous Flow Method
D4780-95(2007)	Standard Test Method for Determination of Low Surface Area of Catalysts by Multipoint Krypton Adsorption
WK9281 Revision of D4780-95(2001)	Standard Test Method for Determination of Low Surface Area of Catalysts by Multipoint Krypton Adsorption
D3663-03(2008)	Standard Test Method for Surface Area of Catalysts and Catalyst Carriers
B922-02(2008)	Standard Test Method for Metal Powder Specific Surface Area by Physical Adsorption

For More information:

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ASTM: Pore Volume, Pore Size and Pore Size Distribution

Number:	Title
D4365-95(2008)	Standard Test Method for Determining Micropore Volume and Zeolite Area of a Catalyst
D4222-03(2008)	Standard Test Method for Determination of Nitrogen Adsorption and Desorption Isotherms of Catalysts by Static Volumetric Measurements
D4641-94(2006)	Standard Practice for Calculation of Pore Size Distributions of Catalysts from Nitrogen Desorption

ASTM: Chemisorption

Number:	Title
D4824-03(2008)	Standard Test Method for Determination of Catalyst Acidity by Ammonia Chemisorption
D3908-03(2008)	Standard Test Method for Hydrogen Chemisorption on Supported Platinum Catalysts by Volumetric Vacuum Method
D3908-99	Standard Test Method for Hydrogen Chemisorption on Supported Platinum on Alumina Catalysts and Catalyst Carriers by Volumetric Vacuum Method (SUPERSEDED)
D5160-95(2003)	Standard Guide for Gas-Phase Adsorption Testing of Activated Carbon
D5228-92(2005)	Standard Test Method for Determination of Butane Working Capacity of Activated Carbon
D5742-95(2005)	Standard Test Method for Determination of Butane Activity of Activated Carbon

ASTM: Mercury Porosimetry

Number:	Title
D4404-84(2004)	Standard Test Method for Determination of Pore Volume and Pore Volume Distribution of Soil and Rock by Mercury Intrusion Porosimetry
D4284-07	Standard Test Method for Determining Pore Volume Distribution of Catalysts by Mercury Intrusion Porosimetry
D 2873-94 (1999)e1	Standard Test Method for Interior Porosity of Poly(Vinyl Chloride) (PVC) Resins by Mercury Intrusion Porosimetry (withdrawn 2003)
C 493-98	Standard Test Method for Bulk Density and Porosity of Granular Refractory Materials by Mercury Displacement (withdrawn 2002)
D6761-07	Standard Test Method for Determination of the Total Pore Volume of Catalysts and Catalyst Carriers

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ASTM: Helium Pycnometry: True Density, Open and Closed Cell Content

Number:	Title
D 2638-91(2002)	Standard Test Method for Real Density of Calcined Petroleum Coke by Helium Pycnometer
D 5550-00	Standard Test Method for Specific Gravity of Soil Solids by Gas Pycnometer
D-4892-89(1999)e1	Standard Test Method for Density of Solid Pitch (Helium Pycnometer Method)
D 6093-97(2003)	Standard Test Method for Percent Volume Nonvolatile Matter in Clear or Pigmented Coatings using a Helium Gas Pycnometer]
D 5965-02(2007)	Standard Test Methods for Specific Gravity of Coating Powders ; [Note: this test method covers three procedures for determining the specific gravity, method B uses He-Pycnometry
D 6226-98e1	Standard Test Method for Open Cell Content of Rigid Cellular Plastics
D70-08	Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method)
B923-02(2008)	Standard Test Method for Metal Powder Skeletal Density by Helium or Nitrogen Pycnometry

ASTM: Tapped Packing Density / Bulk Density

Number:	Title
D4781-99	Standard Test Method for Mechanically Tapped Packing Density of Fine Catalyst Particles and Catalyst Carrier Particles
D4164-99	Standard Test Method for Mechanically Tapped Packing Density of Formed Catalyst and Catalyst Carriers
B 527-93(2000)e1	Standard Test Method for Determination of Tap Density of Metallic Powders and Compounds

DIN Standards

Number:	Title
DIN 66131	Determination of Specific Surface Area of Solids by Gas Adsorption using the Method of Brunauer, Emmett and Teller (BET)
DIN 66133	Determination of Pore Volume Distribution and Specific Surface Area of Solids by Mercury Intrusion
DIN 66134	Mesopore Analysis by Nitrogen Sorption using the Method of Barrett, Joyner and Halenda (BJH)
DIN 66135	Micropore Analysis by Gas Adsorption Part 1: Fundamentals and Testing Procedure Part 2: Evaluation by Isotherm Comparison Part 3: Determination of the Micropore Volume According to Dubinin-Radushkevich Part 4: Determination of Pore Size Distribution According to the Horvath-Kawazoe and Saito-Foley Method

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ISO Standards

	Number:	Title
■	ISO 787-11	General Methods of Tests of Pigments and Extenders- Part 11: Determination of Tapped Volume and Apparent Density after Tapping
■	ISO 9277:1995	Determination of the Specific Surface Area of Solids by Gas Adsorption using the BET Method Please note: This standard is currently under revision – a new draft of this standard already exists in form of a CD (Committee Draft), and is currently being circulated for voting by the ISO-P member as DIS (Draft International Standard)
■	ISO 4590	Cellular plastics- Determination of Volume Percentage of Open and Closed Cells of Rigid Materials
■	ISO 3953	Metallic Powders- Determination of Tap Density
■	ISO 18757	Fine Ceramics (Advanced Ceramics, Advanced Technical Ceramics) – Determination of Specific Surface Area of Ceramic Powders by Gas Adsorption using the BET Method
■	ISO 4652-1:1994	Rubber Compounding Ingredients -- Carbon black -- Determination of Specific Surface Area by Nitrogen Adsorption Methods -- Part 1: Single-Point Procedures
■	ISO 15901-1	Pore Size Distribution and Porosity of Solid Materials by Mercury Porosimetry and Gas Sorption – Part 1 Mercury Porosimetry
■	ISO 15901-2	Pore Size Distribution and Porosity of Solid Materials by Mercury Porosimetry and Gas Sorption – Part 2 Analysis of Mesopores by Gas Adsorption
■	ISO 15901-3	Pore Size Distribution and Porosity of Solid Materials by Mercury Porosimetry and Gas Sorption – Part 3 Analysis of Micropores by Gas Adsorption
■	ISO 18757	Fine Ceramics (Advanced Ceramics, Advanced Technical Ceramics) - Determination of Specific Surface Area of Ceramic Powders by Gas Adsorption using the BET Method
■	ISO 8460:1987	Instant Coffee - Determination of Free-flow and Compacted Bulk Densities
■	ISO 8967:2005	Dried Milk and Dried Milk Products - Determination of Bulk Density

MPIF Standards

	Number:	Title
	01	Sampling Metal Powders
■	46	Determination of Tap Density of Metal Powders
■	63	Density Determination of MIM Components (Gas Pycnometer)

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