SIMPSON ANALYTICS

SAND TESTING TECHNOLOGY

FOR MOLDING AND CORE SANDS

SIMPSON® TECHNOLOGIES

Analyzing Optimizes Intelligence

Reduce Casting Defects and Maximize Profitability

When it comes to proactively preventing sand related casting defects, reducing scrap rates and maximizing profitability, the insight that sand testing technology provides is crucial in developing high-quality castings. Setting up a sand laboratory with the right equipment and using the most accurate technology in the industry are essential when eliminating process inefficiencies that can quickly reduce your foundry's competitiveness.

With more than 70 instruments available, the Simpson Analytics product line provides the largest, most advanced range of sand laboratory technology in the world. Acquiring the former Gerosa and Georg Fischer (+GF+) sand testing technologies enabled us to bring together the best of two powerful product lines.

Today our engineers continue to develop advanced sand testing technology to give you more sophisticated process data – alllowing you to make better decisions to produce castings of higher quality, with fewer defects, resulting in higher profitability.

SIMPSON SAND TESTING TECHNOLOGY FACTS

- No. 1 supplier worldwide
- Most accurate technology resulting in repeatable results
- Largest selection in the world with more than 70 instruments
- Global availability including service and parts

SERVING CUSTOMERS IN OVER 45 COUNTRIES

- Foundries
- Foundry Suppliers
- Research Centers
- Universities

Maintaining High Performance

Consistent Calibration Is Critical

To maintain an instrument's established range of measurement, implementing a regular calibration schedule through Simpson's Performance Partnership plan is essential. Only our global team of authorized service technicians has detailed knowledge, up-to-date training and access to Simpson certified parts for every Simpson instrument.

PERFORMANCE PARTNERSHIP PLAN:

1	2	3	4	5
Annual or biannual on-site calibration	Discount on calibration and service labor	Calibration certificate indicating before and after calibration status	Formal written report covering all work completed	Report history stored by Simpson

Equip Yourself with Knowledge

Visit the Sand Testing Laboratory Online Resource Center

Looking to reduce defects and improve casting quality?

You will need the right equipment.

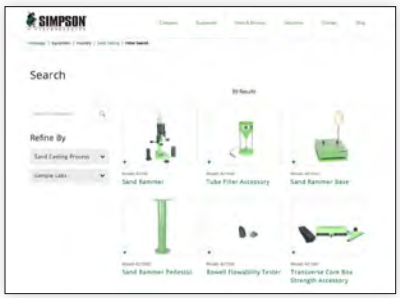
FIND THE BEST SAND LAB TECHNOLOGY FOR YOUR FOUNDRY

View the largest, most advanced selection of sand testing equipment in the world at **www.simpsongroup.com/sandtesting**

Identifying what you need is as easy as 1, 2 or 3.

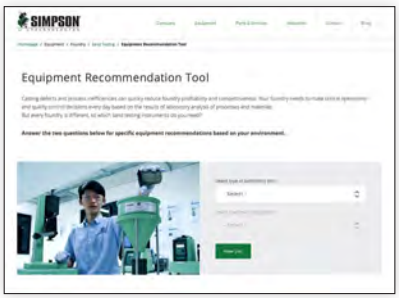
BROWSE OUR EQUIPMENT

Narrow your search with our product filter or enter model numbers in the keyword search field.



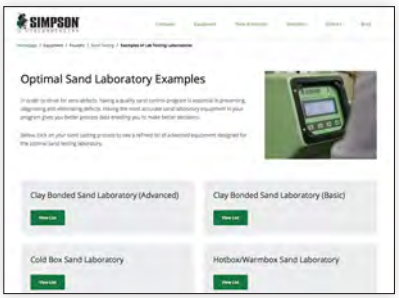
MATCH THE RIGHT EQUIPMENT TO YOUR ENVIRONMENT

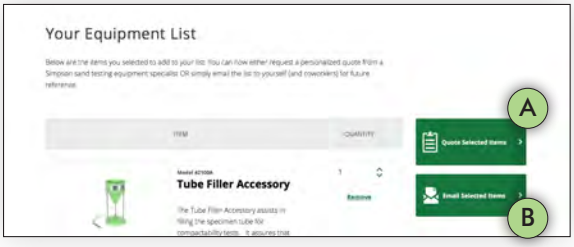
Simply answer two questions from our Equipment Recommendation Tool.



SEE WHAT AN OPTIMAL SAND LAB LOOKS LIKE

Choose your sand casting process for a recommended list.





You can even **create a customized list of equipment (A)** that interests you. Email it to yourself or a coworker, and use it to **request a quote (B)** from our sand testing equipment experts.

Table of Contents

* Please contact sales.us@simpsongroup.com or sales.eu@simpsongroup.com for more information about this product.

MODEL	PRODUCT NAME	PAGE
42106B	Microsplitter	21
PVF-C	Minilab	16
42130	Moisture Analyzer	24
42142	Mold Hardness Tester B-Scale	24
42143	Mold Hardness Tester C-Scale	24
42105B	Mold Permeability Accessory	18
PFP	Mold Strength Tester	24
PFG-MA	Motorized Universal Sand Strength Machine	15
42127	Muffle Furnace	26
PAB-P	Pneumatic Ejector	9
42119	Rapid Sand Washer	22
42105E	Refractory Coating Accessory	19
42106D	Riffle Splitter	21
42100E	Rowell Flowability Tester	8
PBS/3H	Sand Container — Easy Flow	11
PBS/3C	Sand Container — Normal Flow	11
42100	Sand Rammer	7
PRA	Sand Rammer	*
42100C	Sand Rammer Base	7
42100D	Sand Rammer Pedestal	8
PRA/MA	Sand Rammer With Electric Motor Drive	*
42106A	Sand Testing Sieves	21
PKH	Scratch Hardness Tester	25
42159	Shatter Index Tester	20
42105A	Shell Permeability Accessory	18
42104L	Shell Transverse Strength Accessory	14
PSP	Splitting Strength Accessory	14
42104D	Splitting Strength Accessory, Electronic	15
PAB	Stripping Post	*
PTR	Temperature Controller	10
42103	Tensile Core Box	9
42100G	Tensile Strength Core Box Accessory	8
42109	Test Pieces Blower	11
42103A	Transverse Core Box	9
PBC/3	Transverse Core Box — Cold Box	10
PBH/3	Transverse Core Box — Heat Cured	10
42100F	Transverse Strength Core Box Accessory	8
PBK/R	Transverse Strength Core Box Accessory	*
42100A	Tube Filler Accessory	7, 8
PQS	Twin-Transverse Shear Strength Accessory	15
42108B	Ultrasonic Cleaner	23
PFG	Universal Sand Strength Machine	15
42112	Wet Tensile Strength Tester	17

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MODEL: 42110

Laboratory Muller

The Simpson Laboratory Muller is used to prepare mixtures of clay bonded foundry sands. The mulling conditions found in industrial mullers can be emulated on a smaller scale using this laboratory muller.

MODEL: 42111

Laboratory Core Sand Mixer

This mixer is designed to mix liquid binders with sand that is common to all chemically bonded sand mixtures. The mixer features an "S" shaped mixing blade with a vertical shaft that completely mixes the sand mass.

Look for the YouTube icon throughout this brochure, then visit the Simpson YouTube page to see a video demonstrating how the technology works.

Viewing online? Simply click on the YouTube icon to instantly watch a video demonstration.

MODEL: 42160

Digital Pneumatic Sand Squeezer

This sand squeezer is used to prepare standard AFS 2" x 2" (50mm x 50mm) sand specimens and to determine the compactability of prepared clay bonded molding sand. The instrument can be a replacement for the standard 3-ram method of making sand specimens using a traditional sand rammer.

42100A

Tube Filler Accessory

This accessory assists in filling the specimen tube for compactability tests. It assures that properly riddled sand fills the specimen tube from a standard and fixed distance. Both the Digital Pneumatic Sand Squeezer (Model 42160) and the Sand Rammer (Model 42100) use this accessory.

MODEL: 42100

Sand Rammer

The Sand Rammer is used to prepare standard AFS 2" x 2" (50mm x 50mm) cylindrical sand specimens. It is also used to determine the compactability of prepared clay bonded molding sand used in a foundry.

42100C

Sand Rammer Base

To ensure consistent and accurate readings, the Sand Rammer (Model 42100) needs to be isolated from vibration variations. This base is mounted to the rammer to achieve uniform ramming energy.

Additional Accessories for Sand Rammer 42100

42100D

Sand Rammer Pedestal

The Sand Rammer (Model 42100) and its base (Model 42100C) mount to this pedestal to eliminate vibrations that can affect the accuracy of the results and can disturb other instruments residing on the same bench.

42100F

Transverse Strength Core Box Accessory

This accessory is used with the Sand Rammer (Model 42100) to make standard transverse test specimens with air-set or core oil type sand binders.

42100G

Tensile Strength Core Box Accessory

This accessory is used with the Sand Rammer (Model 42100) to make standard tensile test specimens with air-set or core oil type sand binders.

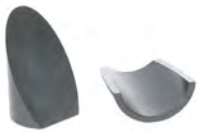
42100A

Tube Filler Accessory

This accessory is required to fill the specimen tube for compactability tests. It assures that properly riddled sand fills the specimen tube from a standard and fixed distance.

42100E

Rowell Flowability Tester



This test is used to determine the flowability of a molding sand.

MODEL: PAB-P

Pneumatic Ejector

This instrument gently ejects the sand specimen from the specimen tube ensuring high repeatability.

MODEL: 42103

Tensile Core Box

This core box makes standard specimens for tensile strength testing using self-curing (air-set) sands.

MODEL: 42103A

Transverse Core Box

This core box makes standard specimens for transverse strength testing using self-curing (air-set) sands.

MODEL: PLS

Labjet Core Blower

The Labjet is designed to manufacture standard transverse test specimens. When using the corresponding attachments, test specimens can be made using gas- and heat-cured core and molding sand.

PTR

Temperature Controller

This device regulates temperature and time when preparing transverse test specimens.

PBH/3

Transverse Core Box — Heat Cured

This accessory is used for manual or mechanical preparation of standard transverse test specimens.

PGC/3

Gassing Head

This accessory is used for gassing the test samples in the core box.

PBC/3

Transverse Core Box — Cold Box

This accessory is used in the production of three transverse strength specimens using a gas-cured molding sand.

Additional Accessories for Labjet Core Blower PLS

PBS/3C & PBS/3H

Sand Containers — Normal & Easy Flow

The sand containers are used for either cold box sand (PBS/3C) or shell/croning sand (PBS/3H).

PGG

Gassing Device

This equipment controls gassing of test specimens for gas-cured molding sand.

MODEL: 42109

Test Pieces Blower

This instrument is used to make standard tensile strength, shell transverse and hot distortion test specimens.

42109A

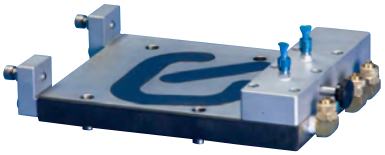
Catalyst Vaporizer

The vaporizer connects to the Test Pieces Blower (Model 42109) in order to control the gassing and purging sequence of the test specimen.

Additional Accessories for Test Pieces Blower 42109

42109B

Cold Box Gassing/ Purging Device



When attached to the Test Pieces Blower (Model 42109), this device produces cold box (gas-cured) test specimens. This accessory is required to properly disperse gas into the specimen and then flush the specimen with a purging gas.

42109C

Disk Transverse Tooling

This tooling is used in the Test Pieces Blower (Model 42109) to prepare a disk transverse specimen.

MODEL: 42104

Electronic Universal Sand Strength Machine

This strength machine is used to determine the strength properties of clay and/or chemically bonded foundry sand specimens. The machine is capable of performing many different sand strength tests with additional fixtures and accessories that are easy to connect. With the required accessories, the machine can measure green and dry compression strength, green and dry shear strength, splitting strength, green deformation at maximum strength, hot shell tensile strength, cold shell tensile and transverse strength, disk transverse strength, and core tensile and transverse strength.

42104N

Cold Shell Tensile Strength Accessory

This accessory is used to determine the tensile strength of shell/croning coated mold and core sands when mounted on the Electronic Universal Sand Strength Machine (Model 42104).

Additional Accessories for Electronic Universal Sand Strength Machine 42104

42104C

Cold Tensile Strength Accessory

When mounted to the Electronic Universal Sand Strength Machine (Model 42104), this accessory measures the cold tensile strength of standard dog bone specimens prepared from cold box, core oil, hotbox/warmbox and nobake/air-set sands.

42104K

Core Transverse Strength Accessory

This accessory is attached to the Electronic Universal Sand Strength Machine (Model 42104) to determine the transverse strength of chemically bonded sand specimens.

42104P

Disk Transverse Accessory

When mounted on the Electronic Universal Sand Strength Machine (Model 42104), this accessory breaks disc transverse specimens.

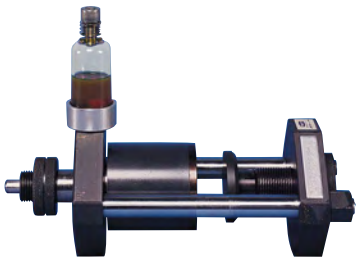
42104E

Green Deformation Accessory

This accessory measures the deformation of a clay bonded sand specimen after a compression strength test is done on the Electronic Universal Sand Strength Machine (Model 42104). Deformation is the change in the length of the sand specimen before and after the compression test.

42104H

High Compression Strength Accessory



This accessory is a force multiplier that, when used with the Electronic Universal Sand Strength Machine (Model 42104), can perform a compression strength test on a standard AFS 2" x 2" (50mm x 50mm) sand specimen with a compression strength range of 250–3100 PSI (170–210 N/cm2).

Additional Accessories for Electronic Universal Sand Strength Machine 42104

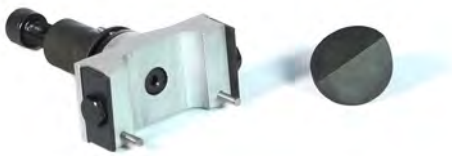
42104F

Hot Shell Tensile Accessory

Measuring the hot tensile strength of shell/croning sands can be performed using this accessory with the Electronic Universal Sand Strength Machine (Model 42104).

42104L

Shell Transverse Strength Accessory



Attached to the Electronic Universal Sand Strength Machine (Model 42104), this accessory measures the transverse strength of shell/croning sand transverse specimens.

42104D

Splitting Strength Accessory

This accessory is attached to the Electronic Universal Sand Strength Machine (Model 42104) to measure splitting strength. This test is considered an indirect measurement of a clay bonded molding sand's tensile strength property.

In a Simpson Technologies survey conducted among attendees at the American Foundry Society Metalcasting Congress, 91 percent of respondents found the information in the online Sand Testing Resource Center either "extremely useful" or "very useful."

Visit www.simpsongroup.com/sandtesting to use the Equipment Recommendation Tool to find the right equipment for your environment.

MODEL: PFG

Universal Sand Strength Machine

This hand-driven strength machine is used to determine the strength properties of clay and/or chemically bonded foundry sand specimens. The device has the capability to run five different sand strength tests with additional fixtures and accessories that are easy to connect to the instrument.

PFG-MA

Motorized Universal Sand Strength Machine

This is an electric motor upgrade option for the Universal Sand Strength Machine (Model PFG). The motor option is designed to replace the manual hand drive.

PBV

Core Transverse Strength Accessory

This accessory is attached to the Universal Sand Strength Machine (Model PFG) to determine the transverse strength of chemically bonded sand specimens.

PQS

Twin-Transverse Shear Strength Accessory

To measure the twin-transverse shear strength of clay bonded molding sand specimens, these two uniquely designed testing clamps are mounted to the Universal Sand Strength Machine (Model PFG).

PSP

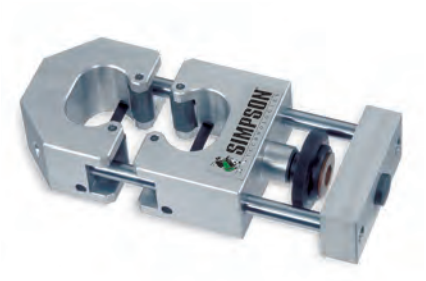
Splitting Strength Accessory

This accessory is attached to the Universal Sand Strength Machine (Model PFG) to measure splitting strength. This test is considered an indirect measurement of a clay bonded molding sand's tensile strength property.

Additional Accessories for Universal Sand Strength Machine PFG

PZV

Cold Tensile Strength Accessory



This accessory is mounted to the Universal Sand Strength Machine (Model PFG) to measure the cold tensile strength of standard dog bone specimens prepared from cold box, core oil, hotbox/warmbox and nobake/air-set sands.

PHM

High Load Gauge

This high load gauge is used for measuring strengths up to 132 N/cm^2.

To ensure your technology maintains an established range of measurement, it is extremely important to implement a regular calibration schedule on all sand testing instrumentation. Being the only authorized provider of calibration services on Simpson equipment means our technicians have detailed knowledge, up-to-date training and access to certified parts for each instrument.

MODEL: PVF-C

Minilab

This multi-purpose instrument is used to determine strength properties of clay and/or chemically bonded sand specimens. The Minilab may be used to create a 50mm x 50mm cylindrical test specimen and can run many different sand strength tests using additional accessories. These tests include: compactability, compression strength, splitting strength, twin-transverse shear strength, core transverse (bending) strength and core tensile strength.

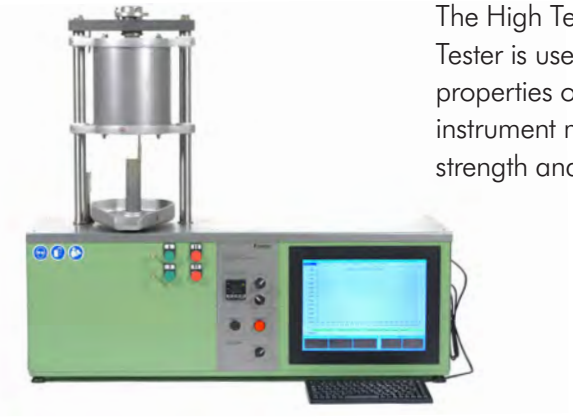
MODEL: 42112

Wet Tensile Strength Tester

The tensile strength of the condensation zone in a clay bonded molding sand can be accurately measured using this technology. The automated instrument simplifies the testing process and displays the wet tensile results in an easy-to-read digital display.

MODEL: 42115

High Temperature Compression Tester



The High Temperature Compression Tester is used to determine the hot strength properties of a molding sand sample. The instrument measures both hot compressive strength and hot deformation.

MODEL: 42116

Hot Properties Rammer

This instrument is used to prepare AFS standard sand specimens of clay bonded molding sand used for high temperature compression testing in the High Temperature Compression Tester (Model 42115).

MODEL: 42105

Digital Absolute Permmeter

The Digital Absolute Permmeter measures the permeability of standard AFS 2" x 2" (50mm x 50mm) sand specimens. With the addition of optional accessories, this instrument can measure the permeability of unbonded sand, coatings, cores and molds.

42105A

Shell Permeability Accessory

This accessory measures the permeability of shell sand samples when attached to the Digital Absolute Permmeter (Model 42105).

42105B

Mold Permeability Accessory

When used with the Digital Absolute Permmeter (Model 42105), this assembly measures the permeability of an actual production mold or core.

42105C

Base Permeability Accessory

When using this device as an accessory to the Digital Absolute Permmeter (Model 42105), the base permeability of loose porous sand masses can be determined.

42105D

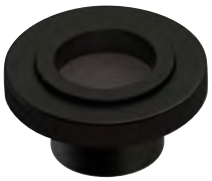
Additional Permeability Accessory

This accessory can be used with the Digital Absolute Permmeter (Model 42105) to measure the permeability of refractory coatings applied to cores and molds.

Additional Accessories for Digital Absolute Permmeter 42105

42105E

Refractory Coating Accessory



This accessory determines permeabilities of core or mold coatings imparted upon the included screens.

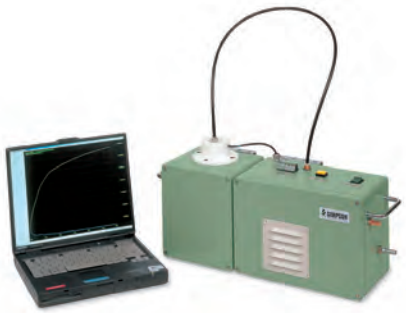
MODEL: 42141

Friability Tester

The friability of clay bonded foundry molding sand can be determined by using this instrument to measure the ability of compacted molding sand to resist abrasion or scuffing within the first few millimeters at the surface of a prepared mold.

MODEL: PGD-E

Gas Pressure Measuring Device



This instrument can be used to accurately measure the gas pressure generated over time from a foundry sand sample heated to a set temperature.

MODEL: 42114

Hot Distortion Tester

The Hot Distortion Tester is specifically designed to rapidly heat and measure any corresponding upward and/or downward deflections of a standard shell transverse sand specimen.

VIEWING ONLINE?

Click any product for detailed information.

MODEL: 42152

Melt Point Tester

This tester measures the temperature at which shell resin coated sands melt and adhere to a heated bar. The melting temperature of the sand is considered the melt point or stick point.

MODEL: 42159

Shatter Index Tester

This tester is designed to measure resistance to degeneration and plasticity of clay bonded sand upon impacting a target at a fixed velocity. This "shatter index" has been shown to correspond to the ability to draw deep pockets during the molding process.

MODEL: 42106

Laboratory Sifter

The sifter is used to determine the grain fineness and distribution of foundry sands.

42106A

Sand Testing Sieves

These sieves are used with the Laboratory Sifter (Model 42106) for determining the grain fineness and distribution of molding and core sands.

42106B

Microsplitter

This accessory is used to prepare a 125 gram or smaller representative sample of unbonded foundry sands for sieve analysis testing.

42106D

Riffle Splitter

When used in conjunction with the Microsplitter (Model 42106B), this accessory is used to prepare a representative sample of unbonded foundry sands for sieve analysis testing. Fourteen (14) 1/2" chutes divide the sand accurately in half to provide representative sand samples down to 125 grams.

Compare your sand laboratory with what an optimal sand lab looks like. Visit www.simpsongroup.com/sandtesting, where you can choose your sand casting process and see a list of recommendations.

MODEL: 42136

Acid Demand Value Tester

The Acid Demand Value (ADV) Tester measures the amount of basic material present in the sand that is soluble in a dilute acid solution.

MODEL: 42131

AFS Clay Tester

The AFS Clay Tester is used to determine the percentage of particles with a diameter less than 20 microns in a foundry sand sample.

42119

Rapid Sand Washer

The Rapid Sand Washer is used to ensure correct and repeatable test results when preparing sand samples for the AFS Clay Tester (Model 42131). This sand washer uses high-speed agitation to remove all clay from the sand grains within the molding sand sample.

Recognizing casting defects is one of the most difficult tasks facing a metalcaster. Determining what is responsible for a defect requires analysis and testing.

MODEL: 42108

Methylene Blue Clay Tester

The Methylene Blue Clay Tester is used to determine the amount of live bentonite clay present in a sand sample.

42108B

Ultrasonic Cleaner

This cleaner is used with the Methylene Blue Clay Tester (Model 42108) to scrub a sand sample before the addition of methylene blue dye.

MODEL: PMK/PRK

Methylene Blue Clay Tester with Magnetic Stirrer

The Methylene Blue Clay Tester is used to determine the amount of live bentonite clay present in a sand sample. This instrument utilizes a magnetic stirrer for removal of the clay coating from the surface of the sand grains.

MODEL: 42130

Moisture Analyzer

To determine the moisture content of green sand and other raw materials used within the foundry, this analyzer can be used.

MODEL: PFP

Mold Strength Tester

This portable electronic handheld tester is used to determine the mold strength on a finished mold.

VIEWING ONLINE?

Click any YouTube icon to watch a video demo.

MODELS: 42142 & 42143

Mold Hardness Testers: B-Scale & C-Scale

Mold hardness is the resistance offered by the surface of a prepared sand mold to be penetrated by a loaded plunger. Both the Mold Hardness Tester B-Scale (Model 42142), which uses a ball penetrator, and the Mold Hardness Tester C-Scale (Model 42143), which uses a conical penetrator, are handheld devices that measure the depth of penetration into a mold surface of a plunger. The C-Scale hardness tester is suitable for molds having hardness readings over 90.

MODEL: PEP

Impact Penetration Tester

This handheld tester determines the degree of curing in lower zones of chemically bonded molds and cores. In addition to identifying curing time, it is useful in determining the proper strip time.

MODEL: PKH

Scratch Hardness Tester

This handheld mechanical instrument is used for the rapid determination of the scratch hardness of chemically bonded molds and cores.

MODEL: 42145

Digital Scratch Hardness Tester

This handheld digital device is used for the rapid determination of the scratch hardness of chemically bonded molds and cores.

MODEL: 42127

Muffle Furnace

This furnace is used to measure the loss on ignition (LOI) and volatiles on both chemically and clay bonded foundry sands.

MODEL: 42129

Drying Oven

The Drying Oven is used to prepare clay bonded molding sands for testing dry sand properties. In addition, the oven can be used to determine the moisture percentage of new sands and prepared molding sands. Washed sand samples from the AFS clay tester can also be dried in this oven.

MODEL: 42147

Desiccator

The desiccator is used to protect sand specimens from water vapor in the air during the cooling of samples after those samples have been heated in the Muffle Furnace (Model 42127).

MODEL: 42118

Digital Balance

The Digital Balance offers a sand laboratory the speed and accuracy required to perform all required weighing applications.

MODEL: 42137

Analytical Balance

This high precision weighing instrument is necessary for standard tests requiring high accuracy measurements.

Simpson Technologies is the global standard in sand testing technology and offers the largest selection of equipment in the world with over 70 instruments.

Visit www.simpsongroup.com/sandtesting to get details on every product in this brochure.

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Email: sales.eu@simpsongroup.com

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Maschinenbau mbH
GERMANY
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