

# Sand Testing Equipment

For Molding and Core Sands



**SIMPSON**  
A Norican Technology

## 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 equipment 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 Sand Testing Product 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 equipment to give you more sophisticated process data – allowing 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 equipment 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 equipment.

#### PERFORMANCE PARTNERSHIP PLAN:

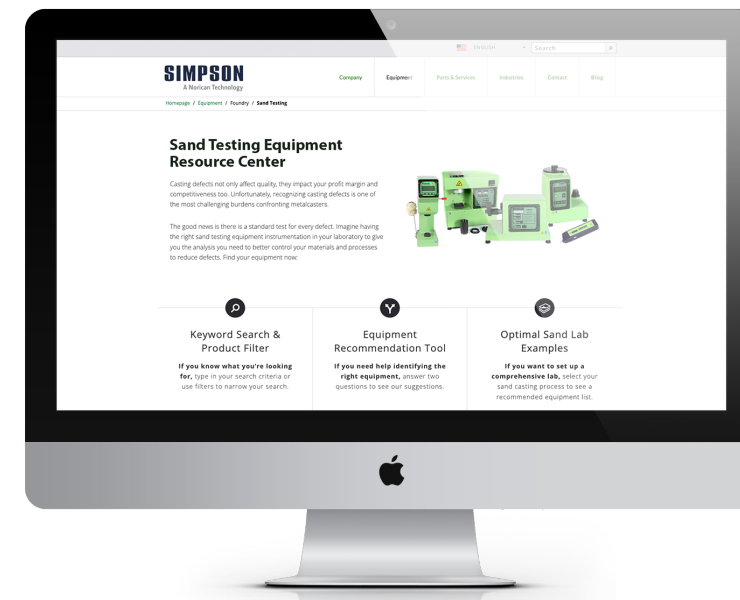
- 01**  
Annual or biannual on-site calibration
- 02**  
Discount on calibration and service labor
- 03**  
Calibration certificate indicating before and after calibration status
- 04**  
Formal written report covering all work completed
- 05**  
Report history stored by Simpson



## Equip Yourself with Knowledge

### Visit the Sand Testing Equipment Online Resource Center

Looking to reduce defects and improve casting quality? You will need the right equipment.



#### FIND THE BEST SAND TESTING EQUIPMENT FOR YOUR FOUNDRY

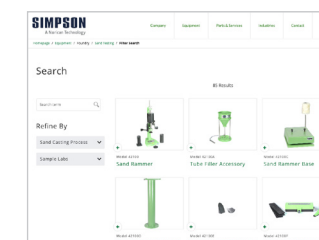
View the largest, most advanced selection of sand testing equipment in the world at [simpsongroup.com/sandtesting](http://simpsongroup.com/sandtesting)

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

### 01

#### BROWSE OUR EQUIPMENT

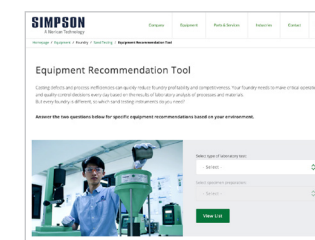
Narrow your search with our product filter or enter model numbers in the keyword search field.



### 02

#### MATCH THE RIGHT EQUIPMENT TO YOUR ENVIRONMENT

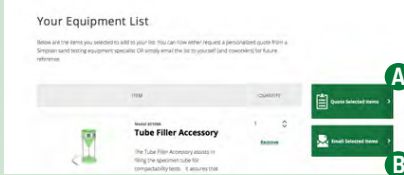
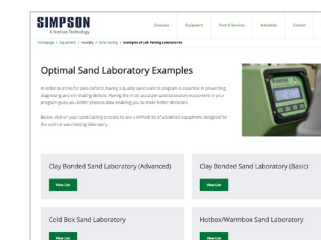
Simply answer one question from our Equipment Recommendation Tool.



### 03

#### 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. Use it to request a quote (B) from our sand testing equipment experts.

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\* Please contact [sales.us@simpsongroup.com](mailto:sales.us@simpsongroup.com) or [sales.de@simpsongroup.com](mailto:sales.de@simpsongroup.com) for more information about this product.

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.

Watch video demonstrations on our YouTube channel or by visiting [simpsongroup.com](http://simpsongroup.com).

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 selfcuring (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.

**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/crooning sand (PBS/3H).

PTR  
**Temperature  
Controller**



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

PGG  
**Gassing Device**



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

PBH/3  
**Transverse  
Core Box —  
Heat Cured**



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

MODEL 42109  
**Test Pieces  
Blower**



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

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).

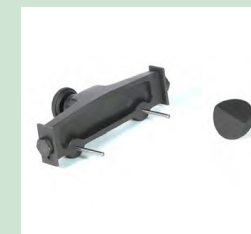
## Additional Accessories for Electronic Universal Sand Strength Machine 42104

### 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



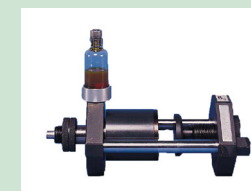
When mounted on the Electronic Universal Sand Strength Machine (Model 42104), this accessory breaks disc transverse specimens.

### 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/cm<sup>2</sup>).

## 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.

# 91%

In a Simpson 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 [simpsongroup.com/sandtesting](http://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 Accessory



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 .

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.

## 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.

### 42105A Shell Permeability Accessory



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

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.

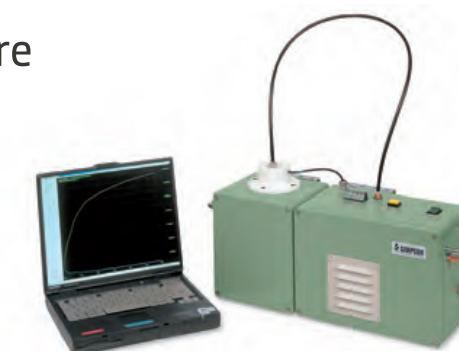
### 42105B Mold Permeability Accessory



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

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.

### 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.

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.

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 [simpsongroup.com/sandtesting](http://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 highspeed agitation to remove all clay from the sand grains within the molding sand sample.

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.

A bottle mounted auto-pipettor is used instead of a glass burette to dispense the methylene blue, easier to use, less mess, and more accurate.

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 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.

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

Visit [simpsongroup.com/sandtesting](http://simpsongroup.com/sandtesting) to get details on every product in this brochure.



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