PRODUCT GUIDE

TEST INSTRUMENTATION

SIMPSON® TECHNOLOGIES




DESIGNED FOR SPECIFIC NEEDS | DEVELOPED TO IMPROVE COMPETITIVENESS

Welcome to the Simpson Technologies Sand Testing Equipment

Since its introduction to the world market in 1993, Simpson sand laboratory instrumentation has become the overwhelming choice of the global foundry industry. Unlike traditional sand testing equipment, the design of modern Simpson equipment utilizes advanced electronics, pneumatics, digital readouts and on-board microprocessors. Studies have shown that Simpson equipment is more accurate, more repeatable, easier to calibrate and easier to use for busy laboratory personnel. The advanced design of this equipment provides more standard features and numerous testing possibilities in comparison to older mechanical testing units. The end result is that for a very reasonable investment in Simpson equipment, better laboratory data can improve your ability to troubleshoot casting defects, as well as certifying and optimizing the casting process. An important quality control tool, Simpson equipment is justified in every foundry operation.

A significant inventory of Simpson instruments and replacement parts are available worldwide. In addition, technical service is also available to assist your every need, from the selection of the proper laboratory equipment to interpretation of test results. Simpson Technologies Corporation is committed to bringing you the very best products and services.

If you would like to receive a quotation, place an order or request additional information, please contact one of our offices at the locations shown on the back of the catalog or visit us at www.simpsongroup.com.

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Appendix

Determining Your Simpson Equipment Needs

The following information can be used to help determine the instruments required for running a particular sand test. In some cases, a series of instruments may be required to correctly prepare a sand specimen for testing, while other instruments are required to perform the actual sand test on the specimen. The *Equipment Selection Chart* has been supplied with this catalog to assist in determining the instruments and accessories required to perform several typical sand tests.

If your need is a complete sand laboratory, refer to the Simpson recommended sand laboratories located in the *Appendix* of this catalog. Choose the sand laboratory that best fits your particular application and then consult with a Simpson Technologies representative for equipment recommendations tailored to your specific laboratory requirements.

SELECTING YOUR EQUIPMENT

To select your Simpson equipment, follow the four steps below.

Step 1: Determine specimen preparation equipment, if specimen is required.
Step 2: Determine necessary laboratory test equipment.
Step 3: Specify applicable testing standard, either AFS (American Foundry Society) or Metric testing standard.
Step 4: Specify equipment voltage requirements.

To determine your instrument requirements, follow Steps 1 and 2 utilizing the color-coded *Equipment Selection Chart* included in this catalog. Steps 3 and 4 will require review of the selected equipment's product page for the available testing standards and voltage options.

HOW TO USE THE EQUIPEMENT SELECTION CHART

A diagram, *How To Use The Equipment Selection Chart,* has also been provided to illustrate how to properly use the *Equipment Selection Chart*. The color-coded chart is divided into several sections:

Specimen Preparation	Yellow
Specimen Preparation equipment	Yellow/White
Laboratory Tests	Blue
Laboratory Test equipment	Purple/White

These sections utilize the following legend for identifying the equipment that is either necessary, equivalent or optional for the preparation of the specimen and performance of the selected laboratory test.

- • Necessary - Indicates that the instrument is required to run the laboratory test.
- **x** Equivalent - Indicates that there are several different methods to run the same test or preform the same task.
- ■ Optional - Indicates instruments that are optional and are not necessarily required to run a particular test.

A detailed example demonstrating the equipment selection process is provided on the following page.

EXAMPLE - HOW TO USE THE *EQUIPMENT SELECTION CHART*

Refer to the color-coded diagram *How To Use The Equipment Selection Chart* on the following page. In this example the *Core Tensile Strength Test* has been selected and highlighted in orange. Follow this row horizontally across the chart to determine if a specimen is required for the test. This row reveals several marked columns indicating four types of specimens available for the *Core Tensile Strength Test.* The required specimen will depend on the core processes that are utilized and, for this example, the *Hot/Warm Box Tensile Specimen* was chosen and identified by the red box.

STEP 1

To determine the specimen preparation equipment required for the *Hot/Warm Box Tensile Specimen*, follow the highlighted column up to where the column intersects with the diagonal line located in the Specimen Preparation section. Now follow this row horizontally across to any marked columns. The columns with marks identify either the necessary, equivalent or optional Simpson equipment required to prepare the *Hot/Warm Box Tensile Specimen*. In this example, a *Test Pieces Blower, Model No. 42109* is the only required equipment to prepare the *Hot/Warm Box Tensile Specimen*. Please note, several pieces of equipment may be required in certain cases.

STEP 2

To determine the Simpson laboratory equipment required to perform the selected *Core Tensile Strength Test*, return to the blue Laboratory Tests section. Follow the Core Tensile Strength row across into the purple and white portion of the chart. The row changes color from orange to green. Follow the green row until it intersects with a marked column. These marked columns indicate that the *Core Tensile Strength Test* requires the *Cold Tensile Strength Accessory, Model No. 42104C* along with the *Electronic Universal Sand Strength Machine, Model No. 42104.*

STEP 3

Select the desired test standard, either AFS (American Foundry Society) or Metric testing standard. Refer to the appropriate product page for the selected equipment which indicates availability of AFS or Metric testing standards.

STEP 4

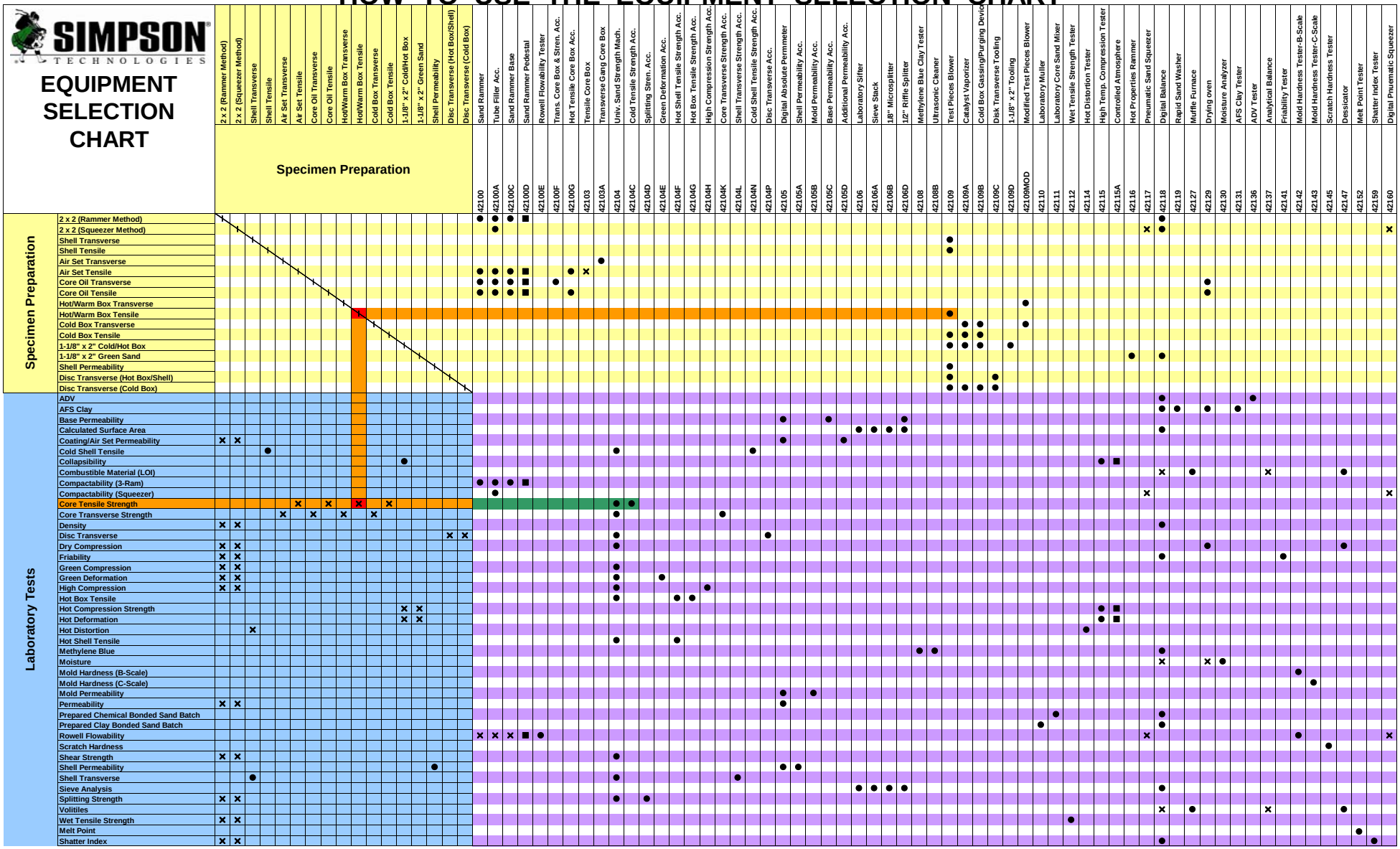
Specifying the equipment voltage requirement is the final step in selecting Simpson laboratory equipment. Refer to the appropriate product page for the selected equipment which indicates the available voltages. For additional Simpson equipment information, refer to the *General Dimensions and Technical Data* chart located on pages v and vi.

If you have any questions regarding the selection of Simpson laboratory equipment, please do not hesitate to contact Simpson Technologies for assistance.

HOW TO USE THE EQUIPMENT SELECTION CHART

SIMPSON TECHNOLOGIES

EQUIPMENT SELECTION CHART



Legend: Necessary ●, Equivalent ×, Optional ■

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EQUIPMENT SELECTION CHART

Specimen Preparation

| Specimen Preparation | 42100 Sand Rammer | 42100A Tube Filler Acc. | 42100C Sand Rammer Base | 42100D Sand Rammer Pedestal | 42100E Rowell Flowability Tester | 42100F Trans. Core Box & Stren. Acc. | 42100G Hot Tensile Core Box Acc. | 42103 Tensile Core Box | 42103A Transverse Gang Core Box | 42104 Univ. Sand Strength Mach. | 42104C Cold Tensile Strength Acc. | 42104D Splitting Stren. Acc. | 42104E Green Deformation Acc. | 42104F Hot Shell Tensile Strength Acc. | 42104G Hot Box Tensile Strength Acc. | 42104H High Compression Strength Acc. | 42104K Core Transverse Strength Acc. | 42104L Shell Transverse Strength Acc. | 42104N Cold Shell Tensile Strength Acc. | 42104P Disc Transverse Acc. | 42105 Digital Absolute Permmeter | 42105A Shell Permeability Acc. | 42105B Mold Permeability Acc. | 42105C Base Permeability Acc. | 42105D Additional Permeability Acc. | 42106 Laboratory Sifter | 42106A Sieve Stack | 42106B 1/8" Microsplitter | 42106D 1/2" Riffle Splitter | 42108 Methylene Blue Clay Tester | 42108B Ultrasonic Cleaner | 42109 Test Pieces Blower | 42109A Catalyst Vaporizer | 42109B Cold Box Gassing/Purging Devic | 42109C Disk Transverse Tooling | 42109D 1-1/8" x 2" Tooling | 42109MOD Modified Test Pieces Blower | 42110 Laboratory Muller | 42111 Laboratory Core Sand Mixer | 42112 Wet Tensile Strength Tester | 42114 Hot Distortion Tester | 42115 High Temp. Compression Tester | 42115A Controlled Atmosphere | 42116 Hot Properties Rammer | 42117 Pneumatic Sand Squeezer | 42118 Digital Balance | 42119 Rapid Sand Washer | 42127 Muffle Furnace | 42129 Drying oven | 42130 Moisture Analyzer | 42131 AFS Clay Tester | 42136 ADV Tester | 42137 Analytical Balance | 42141 Friability Tester | 42142 Mold Hardness Tester-B-Scale | 42143 Mold Hardness Tester-C-Scale | 42145 Scratch Hardness Tester | 42147 Dessicator | 42152 Melt Point Tester | 42159 Shatter Index Tester | 42160 Digital Pnuematic Squeezer |
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APPROXIMATE DIMENSIONS and SHIPPING WEIGHTS

Model Number	Description	Bulk Weight	Estimated Shipping Weight	Approx. Instrument Dimensions
42100	**Sand Rammer**	22.7 kgs. (50 lbs.)	37 kgs. (80 lbs.)	191mm x 241mm x 559mm (7.5" x 9.5" x 22")
42100A	Tube Filler Accessory	1.2 kgs. (2.6 lbs.)	2.3 kgs. (5 lbs.)	210mm x 210mm x 356mm (8.25" x 8.25" x 14")
42100C	Sand Rammer Base	51.1 kgs. (112.5 lbs.)	63.2 kgs. (139 lbs.)	254mm x 356mm x 89mm (10" x 14" x 3.5")
42100D	Sand Rammer Pedestal	33.2 kgs. (73 lbs.)	47.7 kgs. (105 lbs.)	267mm Dia. x 851mm (10.5" Dia. x 33.5")
42100E	Rowell Flowability Tester	1 kg. (2.2 lbs.)	2.3 kgs. (5 lbs.)	64mm x 64mm x 64mm (2.5" x 2.5" x 2.5")
42100F	Transverse Core Box Strength Accessory	5.2 kgs. (11.5 lbs.)	9.1 kgs. (20 lbs.)	210mm x 114mm x 114mm (8.25" x 4.5" x 4.5")
42100G	Hot Tensile Core Box Accessory	2 kgs. (4.4 lbs.)	3.6 kgs. (8 lbs.)	102mm x 102mm x 152mm (4" x 4" x 6")
42103	**Tensile Core Box (9 Cavity)**	3.6 kgs. (8 lbs.)	6.8 kgs. (15 lbs.)	330mm x 241mm x 51mm (13" x 9.5" x 2")
42103A	**Transverse Core Box (9 Cavity)**	3.6 kgs. (8 lbs.)	6.8 kgs. (15 lbs.)	305mm x 438mm x 38mm (12" x 17.25" x 1.5")
42104	**Electronic Universal Sand Strength Machine**	30 kgs. (66 lbs.)	43.2 kgs. (95 lbs.)	457mm x 305mm x 305mm (18" x 12" x 12")
42104C	Cold Tensile Strength Accessory	1.5 kgs. (3.3 lbs.)	3.6 kgs. (8 lbs.)	83mm x 32mm x 229mm (3.25" x 1.25" x 9")
42104D	Splitting Strength Accessory	0.5 kgs. (1 lb.)	2.3 kgs. (5 lbs.)	64mm x 64mm x 51mm (2.5" x 2.5" x 2")
42104E	Green Deformation Accessory	1.8 kgs. (4 lbs.)	3.6 kgs. (8 lbs.)	70mm x 102mm x 203mm (2.75" x 4" x 8")
42104F	Hot Shell Tensile Accessory	8.2 kgs. (18 lbs.)	11.4 kgs. (25 lbs.)	400mm x 305mm x 305mm (15.75" x 12" x 12")
42104G	Hot Box Tensile Accessory	2.3 kgs. (5 lbs.)	4.5 kgs. (10 lbs.)	102mm x 64mm x 89mm (4" x 2.5" x 3.5")
42104H	High Compression Strength Accessory	2.7 kgs. (6 lbs.)	4.5 kgs. (10 lbs.)	254mm x 127mm x 203mm (10" x 5" x 8")
42104K	Core Transverse Strength Accessory	1.5 kgs. (3.3 lbs.)	3.6 kgs. (8 lbs.)	165mm x 64mm x 89mm (6.5" x 2.5" x 3.5")
42104L	Shell Transverse Strength Accessory	1.5 kgs. (3.3 lbs.)	3.6 kgs. (8 lbs.)	89mm x 38mm x 102mm (3.5" x 1.5" x 4")
42104N	Cold Shell Tensile Strength Accessory	2 kgs. (4.4 lbs.)	4.5 kgs. (10 lbs.)	254mm x 102mm x 64mm (10" x 4" x 2.5")
42104P	Disc Transverse Accessory	1 kg. (2.2 lbs.)	2.3 kgs. (5 lbs.)	70mm x 64mm x 64mm (2.75" x 2.5" x 2.5")
42105	**Digital Absolute Permmeter**	21.8 kgs. (48 lbs.)	28.6 kgs. (63 lbs.)	260mm x 362mm x 521mm (10.25" x 14.25" x 20.5")
42105A	Shell Permeability Accessory	0.5 kgs. (1 lb.)	2.3 kgs. (5 lbs.)	57mm Dia. x 76mm (2.25" Dia. x 3")
42105B	Mold Permeability Accessory	0.3 kgs. (.65 lbs.)	2.3 kgs. (5 lbs.)	57mm Dia. x 914mm (2.25" Dia. x 36")
42105C	Base Permeability Accessory	1 kg. (2.2 lbs.)	2.3 kgs. (5 lbs.)	64mm Dia. x 222mm (2.5" Dia. x 8.75")
42105D	Additional Permeability Accessory	0.7 kgs. (1.5 lbs.)	2.3 kgs. (5 lbs.)	102mm x 102mm x 121mm (4" x 4" x 4.75")
42106	**Laboratory Sifter**	39.1 kgs. (86 lbs.)	75 kgs. (165 lbs.)	305mm x 362mm x 800mm (12" x 14.25" x 31.5")
42106A	Sand Testing Sieves	5.5 kgs. (12 lbs.)	6.8 kgs. (15 lbs.)	203mm Dia. x 330mm (8" Dia. x 13")
42106B	1/8" Microsplitter	1.8 kgs. (4 lbs.)	2.3 kgs. (5 lbs.)	114mm x 114mm x 203mm (4.5" x 4.5" x 8")
42106D	1/2" Riffle Splitter	7.7 kgs. (17 lbs.)	9.1 kgs. (20 lbs.)	381mm x 292mm x 356mm (15" x 11.5" x 14")
42108	**Methylene Blue Clay Tester**	20.9 kgs. (46 lbs.)	25 kgs. (55 lbs.)	25mm x 305mm x 749mm (1" x 12" x 29.5")
42108B	Ultrasonic Cleaner	3.2 kgs. (7 lbs.)	7.3 kgs. (16 lbs.)	305mm x 254mm x 305mm (12" x 10" x 12")
42109	**Test Pieces Blower**	47.3 kgs. (104 lbs.)	53.2 kgs. (117 lbs.)	432mm x 406mm x 584mm (17" x 16" x 23")
42109A	Catalyst Vaporizer	47.3 kgs. (104 lbs.)	53.2 kgs. (117 lbs.)	483mm x 400mm x495mm (19" x 15.75" x 19.5")

APPROXIMATE DIMENSIONS and SHIPPING WEIGHTS

Model Number	Description	Bulk Weight	Estimated Shipping Weight	Approx. Instrument Dimensions
42109B	Cold Box Gassing/Purging Device	2 kgs. (4.4 lbs.)	4.5 kgs. (10 lbs.)	229mm x 64mm x 152mm (9" x 2.5" x 6")
42110	**Laboratory Muller**	100 kgs. (220 lbs.)	120 kgs. (264 lbs..)	508mm x 533mm x 457mm (20" x 21" x 18")
42111	**Laboratory Core Sand Mixer**	50 kgs. (110 lbs.)	58 kgs. (128 lbs.)	521mm x 273mm x 324mm (20.5" x 10.75" x 12.75")
42112	**Wet Tensile Strength Tester**	50 kgs. (110 lbs.)	58 kgs. (128 lbs.)	445mm x 311mm x 483mm (17.5" x 12.25" x 19")
42113	**Calibration Kit**	6.8 kgs. (15 lbs.)	10 kgs. (22 lbs.)	451mm x 305mm x 102mm (17.75" x 12" x 4")
42114	**Hot Distortion Tester**	47.3 kgs. (104 lbs.)	68.2 kgs. (150 lbs.)	419mm x 635mm x 298mm (16.5" x 25" x 11.75")
42115	**High Temperature Compression Tester**	80 kgs. (176 lbs.)	102.3 kgs. (225 lbs.)	1,041mm x 400mm x 940mm (41" x 15.75" x 37")
42115A	Controlled Atmosphere Testing Accessory	1 kg. (2.2 lbs.)	2.3 kgs. (5 lbs.)	38mm Dia. x 51mm (1.5" Dia. x 2")
42116	**Hot Properties Rammer**	20 kgs. (44 lbs.)	29.5 kgs. (65 lbs.)	203mm x 229mm x 660mm (8" x 9" x 26")
42117	**Pneumatic Sand Squeezer**	18.2 kgs. (40 lbs.)	40.9 kgs. (90 lbs.)	330mm x 279mm x 508mm (13" x 11" x 20")
42118	**Digital Balance**	4 kgs. (8.7 lbs.)	5.5 kgs. (12 lbs.)	345mm x 231mm x 89mm (13.6" x 9.1" x 3.5")
42119	**Rapid Sand Washer**	5.5 kgs. (12 lbs.)	9.1 kgs. (20 lbs.)	305mm x 216mm x 216mm (12" x 8.5" x 8.5")
42125	**Mechanical Load Cell**	1 kg. (2.2 lbs.)	2.3 kgs. (5 lbs.)	191mm x 102mm x 25mm (7.5" x 4" x 1")
42126	**Muffle Furnace**	21.8 kgs. (48 lbs.)	23.6 kgs. (52 lbs.)	279mm x 635mm x 457mm (11" x 25" x 18")
42127	**Muffle Furnace**	43.6 kgs. (96 lbs.)	50 kgs. (110 lbs.)	483mm x 533mm x 737mm (19" x 21" x 29")
42128	**Drying Oven**	63.6 kgs. (140 lbs.)	76.4 kgs. (168 lbs.)	584mm x 813mm x 489mm (23" x 32" x 19.25")
42129	**Drying Oven**	81.8 kgs. (180 lbs.)	95.5 kgs. (210 lbs.)	686mm x 864mm x 540mm (27" x 34" x 21.25")
42130	**Moisture Analyzer**	4.5 kgs. (10 lbs.)	6.8 kgs. (15 lbs.)	229mm x 356mm x 152mm (9" x 14" x 6")
42131	**AFS Clay Tester**	11.4 kgs. (25 lbs.)	25.5 kgs. (56 lbs.)	584mm x 343mm x 279mm (23" x 13.5" x 11")
42132	**Permeability Standard**	1.5 kgs. (3.3 lbs.)	2.3 kgs. (5 lbs.)	64mm Dia. x 121mm (2.5" Dia. x 4.75")
42133	**Pressure Manometer**	0.6 kgs. (1.3 lbs.)	2.3 kgs. (5 lbs.)	83mm x 83mm x 203mm (3.25" x 3.25" x 8")
42136	**ADV Tester**	3.6 kgs. (8 lbs.)	6.8 kgs. (15 lbs.)	254mm x 216mm x 64mm (10" x 8.5" x 2.5")
42137	**Analytical Balance**	10 kgs. (22 lbs.)	15.9 kgs. (35 lbs.)	419mm x 203mm x 311mm (16.5" x 8" x 12.25")
42141	**Friability Tester**	10 kgs. (22 lbs.)	15.9 kgs. (35 lbs.)	318mm x 292 x 254mm (12.5" x 11.5" x 10")
42142 **42143**	**Electronic Mold Hardness Tester** (42142 - B-Scale, 42143 - C-Scale)	1 kg. (2.2 lbs.)	2.9kgs. (6.3 lbs.)	102mm x 64mm x 32mm (4" x 2.5" x 1.25")
42142ADV **42143ADV**	**Advanced Electronic Mold Hardness Tester** (42142ADV - B-Scale, 42143ADV - C-Scale)	1.7 kgs. (3.8 lbs.)	3.5 kgs. (7.8 lbs.)	102mm x 64mm x 32mm (4" x 2.5" x 1.25")
42145	**Electronic Scratch Hardness Tester**	2 kgs. (4.4 lbs.)	3.9 kgs. (8.5 lbs.)	140mm x 64mm x 32mm (5.5" x 2.5" x 1.25")
42152	**Melt Point Tester**	18.2 kgs. (40 lbs.)	40.9 kgs. (90 lbs.)	381mm x 280mm x 685mm (15" x 11" x 25")
42159	**Shatter Index Tester**	44.8 kgs. (115 lbs.)	90 kgs. (198 lbs.)	1397mm x 610mm x 508mm (55" x 24" x 20")
42160	**Digital Pneumatic Sand Squeezer**	38.6 kgs. (85 lbs.)	40.9 kgs. (90 lbs.)	330mm x 279mm x 508mm (13" x 11" x 20")

Sand Rammer

Description

Model 42100

The *Sand Rammer* can be used to prepare a standard 2” x 2” AFS sand specimen (50mm x 50mm metric) and to determine the compactability of prepared molding sand or the workability of moldable refractories in the ceramics industry. The standard sand specimen is used in various tests including permeability, compressive strength, shear strength, friability, etc. (See the *Equipment Selection Chart* on page iv for more details.) The sand to be tested is placed into the specimen tube and compacted by a weight. Two measurement scales are provided on the stem of the Sand Rammer. One scale is for measuring compactability and another for measuring the final specimen height. The scales can also be used to determine the proper sample weight required for preparation of a standard sand specimen.

The *Sand Rammer* includes a stripping post, specimen tube and tube pedestal. Note: The *Tube Filler Accessory, Model No. 42100A,* is required with the *Sand Rammer* to determine the compactability of prepared molding sand.

Testing Standards

AFS:	Part Number: 0042100
Metric:	Part Number: 0042100-M
ASTM C181:	Part Number: 0042100-W

Dimensions and Weights (Approximate)

Length:	191mm (7.5”)
Width:	241mm (9.5”)
Height:	559mm (22”)
Weight:	22.7 kgs. (50 lbs.)

Replacement Parts

AFS Specimen Tube:	Part Number: 0042100H
Metric Specimen Tube:	Part Number: 0042100H-M
Tube Cleaning Swabs (Page 13)	Part Number: 0042100J

Calibration

Proving Rings:	Part Number: 0042134
Anvil:	Part Number: 0042134A
AFS Master Steel Specimen:	Part Number: 208501
Metric Master Steel Specimen:	Part Number: 208600

Accessories

42100A	Tube Filler Accessory, (See page 2)
42100C	Sand Rammer Base, (See page 2)
42100D	Sand Rammer Pedestal, (*See page 3*)
42100E	Rowell Flowability Tester, (*See page 3*)
42100F	Transverse Core Box Strength Accessory, (*See page 4*)
42100G	Hot Tensile Core Box Accessory, (*See page 4*)

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Tube Filler Accessory

Description

Model 42100A

This accessory is used with the *Sand Rammer, Model No. 42100,* to assist in filling the specimen tube for the compactability test. The tube filler assures that properly riddled sand fills the specimen tube from a standard and fixed distance. This accessory is required with the *Sand Rammer, Model No. 42100, and Sand Squeezers Model Nos. 42117 and 42160,* to determine the compactability of prepared molding sand.

The *Tube Filler Accessory* includes a removable screen and strike-off bar.

Testing Standards

AFS:	Part Number: 0042100A
Metric:	Part Number: 0042100A-M

Dimensions and Weights (Approximate)

Length:	210mm (8.25”)
Width:	210mm (8.25”)
Height:	356mm (14”)
Weight:	1.2 kgs. (2.6 lbs.)

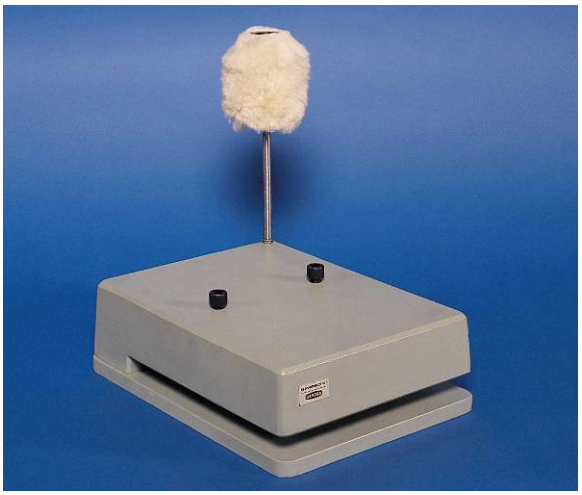
Replacement Parts

Replacement Screen:	Part Number 0045639

Sand Rammer Base

Description

Model 42100C



The *Sand Rammer, Model No. 42100,* is mounted to this base to isolate the rammer from vibration variations to assure consistent and accurate readings. It insures uniform ramming energy regardless of where the *Sand Rammer* is used. The base is fitted with a *Specimen Tube Swab, Model No. 42100J,* to clean and prepare the specimen tube before testing.

The *Sand Rammer Base* includes one replaceable tube swab.

Testing Standards

AFS:	Part Number: 0042100C
Metric:	Not Applicable – This part is universal

Dimensions and Weights (Approximate)

Length:	254mm (10”)
Width:	356mm (14”)
Height:	89mm (3.5”)
Weight:	51.1 kgs. (112.5 lbs.)

Replacement Parts

Tube Cleaning Swabs	Part Number 0042100J

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Sand Rammer Pedestal

Description

Model 42100D

The *Sand Rammer Base, Model No. 42100C,* and the *Sand Rammer, Model No.42100,* mount to this pedestal to eliminate vibrations that can affect the accuracy of the results and disturb other sensitive instruments on the same bench. The pedestal transmits the ramming energy directly to the laboratory floor.

Testing Standards

AFS:	Part Number: 0042100D
Metric:	Not Applicable – This part is universal

Dimensions and Weights (Approximate)

Diameter:	267mm (10.5”)
Height:	851mm (33.5”)
Weight:	33.2 kgs. (73 lbs.)

Rowell Flowability Tester

Description

Model 42100E

Rowell flowability determines molding sands ability to tightly compact into deep pockets on a pattern. The *Rowell Flowability Tester* is a specially designed pattern that is inserted into a standard *Specimen Tube, Model No. 42100H (not shown)*. The specimen tube is then filled with sand and rammed with a *Sand Rammer, No. 42100*. The resultant sand specimen is placed onto a specially designed cradle. Mold hardness readings are taken at different locations on the specimen. Rowell flowability is the percent difference in hardness between the top and bottom of the specimen. The test requires the *Sand Rammer, Model No.42100* and the *Electronic Mold Hardness Tester B-Scale, Model No. 42142*.

The *Rowell Flowability Tester* includes a pattern and specimen cradle.

Testing Standards

AFS:	Part Number: 0042100E
Metric:	Part Number: 0042100E-M

Dimensions and Weights (Approximate)

Length:	64mm (2.5”)
Width:	64mm (2.5”)
Height:	64mm (2.5”)
Weight:	1 kg. (2.2 lbs.)

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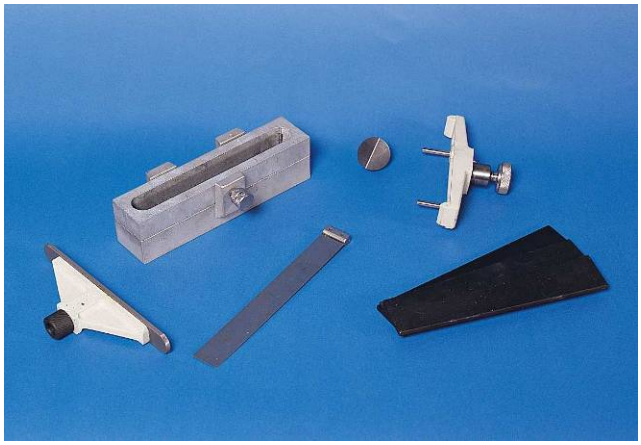
Transverse Core Box Strength Accessory

Description

Model 42100F

The *Transverse Core Box Strength Accessory* is used with the *Sand Rammer, Model No. 42100,* to make standard transverse sand specimens bonded with air set or core oil type binders. The kit includes the *Core Transverse Strength Accessory, Model No. 42104K,* for the *Electronic Universal Sand Strength Machine, Model No. 42104,* and tooling to form the transverse sand specimen, special rammer foot and, if required, three dryer plates for baking the rammed sand specimens. The prepared sand specimens are used in the *Electronic Universal Sand Strength Machine, Model No. 42104* to determine cold transverse strength.



Testing Standards

AFS:	Part Number: 0042100F
Metric:	Part Number: 0042100F-M

Dimensions and Weights (Approximate)

Length:	210mm (8.25”)
Width:	114mm (4.5”)
Height:	114mm (4.5”)
Weight:	5.2 kgs. (11.5 lbs.)

Hot Tensile Core Box Accessory

Description

Model 42100G

The *Hot Tensile Core Box Accessory* is used with the *Sand Rammer, Model No. 42100* to prepare standard tensile dog bone specimens bonded with air set or core oil type binders. The kit includes tooling to form the tensile specimen, special rammer foot and if required, three dryer plates for baking the rammed sand specimens. These specimens are used in the *Electronic Universal Sand Strength Machine, Model No. 42104* and the *Cold Tensile Strength Accessory, Model No. 42104C* to determine cold tensile strength.

Testing Standards

AFS:	Part Number: 0042100G
Metric:	Part Number: 0042100G-M

Dimensions and Weights (Approximate)

Length:	102mm (4”)
Width:	102mm (4”)
Height:	152mm (6”)
Weight:	2 kgs. (4.4 lbs.)

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Tensile Core Box Accessory (9 Cavity)

Description

Model 42103

The *Tensile Core Box* is used to make standard specimens for tensile strength testing using self-curing (air set) sands. This core box molds nine dog bone sand samples simultaneously. It consists of three, 3-cavity core boxes inside of a hard wood frame. A strike off bar is included.

Testing Standards

AFS:	Part Number: 0042103
Metric:	Part Number: 0042103-M

Dimensions and Weights (Approximate)

Length:	330mm (13”)
Width:	241mm (9.5”)
Height:	51mm (2”)
Weight:	3.6 kgs. (8 lbs.)

Transverse Core Box Accessory (9 Cavity)

Description

Model 42103A

A *Transverse Core Box* is used to make standard specimens for transverse strength testing using self-curing (air set) sands. This core box consists of nine individual cavity boxes within a wooden frame. Specimen dimensions are 8” x 1” x 1” for AFS and 22.4mm x 22.4mm x 175mm for metric. A strike off bar is included.

Testing Standards

AFS:	Part Number: 0042103A
Metric:	Part Number: 0042103A-M

Dimensions and Weights (Approximate)

Length:	305mm (12”)
Width:	438mm (17.25”)
Height:	38mm (1.5”)
Weight:	3.6 kgs. (8 lbs.)

SIMPSON® TECHNOLOGIES

Electronic Universal Sand Strength Machine

Description

Model 42104

The *Electronic Universal Sand Strength Machine* is used to determine the strength properties of clay and/or chemically bonded sand specimens. A horizontally moving arm applies pressure on a sand specimen until failure. After maximum force is reached, the test is complete and the machine resets. The force data is clearly displayed on a digital display. When testing green compression strength the sand specimen is not crushed because the test stops at the maximum force. This keeps the test area clean and allows the operator to measure green deformation at maximum strength, using the *Green Deformation Accessory, Model No. 42104E*.

The strength machine is also capable of running many different sand strength tests with additional fixtures and accessories that are easy to connect to the instrument. These tests include 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 strengths, disc transverse strength, core tensile and transverse strengths, and hot box tensile strength. After putting the specimen in place, the operator only needs to select the correct test option and press the start button. The five-digit display shows the strength value of the specimen, in N/cm^2 or PSI, depending on the operator's preference. The design of the strength machine incorporates digital calibration that can be completed in minutes and only requires the *Mechanical Load Cell, Model No. 42125* (sold separately). The *Mechanical Load Cell, Model No. 42125* is certified with National Institute of Standards and Technology **(**NIST) traceable weights. The strength machine is shipped with the accessories required to test green and dry compression strength and shear strength.

The *Electronic Universal Sand Strength Machine,* includes the accessories required to determine compression and shear strengths, pneumatic regulator and lubricator, pneumatic hose and connectors to connect the supplied regulator/filter/lubricator to the strength machine.

Specifications

Load Cell Capacity:	500 kgs. (1,102 lbs.)
Calibration:	Digital via Touch Pad (Load cell calibration requires *Mechanical Load Cell*, *Model No. 42125*.)
Power Requirements:	115/220 Volts, 50-60 Hz
Compressed Air:	5 to 6 bar (72-87 psi)

Testing Standards

AFS:	Part Number: 0042104-ASM
Metric:	Part Number: 0042104-M-ASM

Dimensions and Weights (Approximate)

Length:	457mm (18")
Width:	305mm (12")
Height:	305mm (12")
Weight:	30 kgs. (66 lbs.)

Accessories

42104C	Cold Tensile Strength Accessory, see page 7
42104D	Splitting Strength Accessory, see page 7
42104E	Green Deformation Accessory, see page 8
42104F	Hot Shell Tensile Accessory, see page 8
42104G	Hot Box Tensile Accessory, see page 9
42104H	High Compression Strength Accessory, see page 9
42104K	Core Transverse Strength Accessory, see page 10
42104L	Shell Transverse Strength Accessory, see page 10
42104N	Cold Shell Tensile Strength Accessory, see page 11
42104P	Disc Transverse Accessory, see page 11

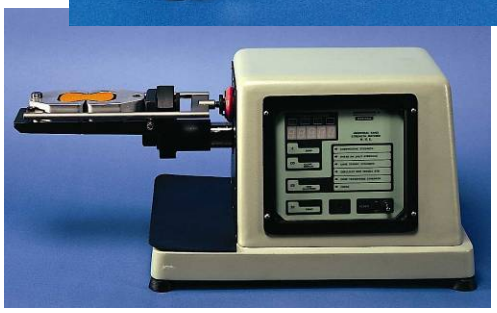
SIMPSON® TECHNOLOGIES

Cold Tensile Strength Accessory

Description

Model 42104C

This accessory is mounted on the *Electronic Universal Sand Strength Machine, Model No. 42104*. The test determines the cold tensile strength of standard dog bone specimens prepared from oil, cold box, hot box and air set sands.



Part No. 42014C shown mounted to the *Electronic Universal Sand Strength Machine, No. 42104.*

Testing Standards

AFS:	Part Number: 0042104C
Metric:	Part Number: 0042104C-M

Dimensions and Weights (Approximate)

Length:	83mm (3.25”)
Width:	32mm (1.25”)
Height:	229mm (9”)
Weight:	1.5 kgs. (3.3 lbs.)

Splitting Strength Accessory

Description

Model 42104D

This accessory which mounts on the *Electronic Universal Sand Strength Machine, Model No. 42104* is used to determine the splitting strength of clay bonded molding sands. A standard 2” x 2” AFS sand specimen (50mm x 50mm metric) is placed between two testing clamps with its radial surface against the face of each clamp. When the specimen is compressed through its diameter, a split is formed along its horizontal axis. The splitting test is considered an indirect measurement of sand tensile strength properties.

Testing Standards

AFS:	Part Number: 0042104D
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	64mm (2.5”)
Width:	64mm (2.5”)
Height:	51mm (2”)
Weight:	0.5 kgs. (1 lbs.)

SIMPSON® TECHNOLOGIES

Green Deformation Accessory

Description

Model 42104E

This accessory measures the deformation of the green sand specimen after a compression test on the *Electronic Universal Sand Strength Machine, Model No. 42104*. Deformation is the change in the length of the sand specimen before and after the compression test. Deformation measurements indicate the plastic characteristics of a molding sand.

For more information about deformation testing, see the article *"Green Deformation at Maximum Strength"* located on our web site at www.simpsongroup.com.

Testing Standards

AFS:	Part Number: 0042104E
Metric:	Part Number: Not Applicable – Universal

Dimensions and Weights (Approximate)

Length:	70mm (2.75")
Width:	102mm (4")
Height:	203mm (8")
Weight:	1.8 kgs. (4 lbs.)

Hot Shell Tensile Accessory

Description

Model 42104F

This accessory to the *Electronic Universal Sand Strength Machine, Model No. 42104* is used to measure the hot tensile strength of shell sands. The unit has both mechanical and electrical connections to the *Electronic Universal Sand Strength Machine, Model No. 42104*. Using the control cabinet, the operator sets the desired testing time and temperature. The heated core box is manually filled with sand. At the proper dwell time, the strength machine automatically breaks the specimen. The hot tensile strength results are shown on the five-digit display of the strength machine.

The *Hot Shell Tensile Accessory* includes the temperature and timer control cabinet, upper and lower heating block assembly, sand specimen tooling, tooling bridge, sand scoop/strike-off and magnetic tooling extraction device.

Part No. 0042104F shown mounted to the *Electronic Universal Sand Strength Machine, No. 42104.*

Testing Standards & Specifications

AFS & 115 Volts, 60 Hz:	Part Number: 0042104F
AFS & 230 Volts, 50/60 Hz:	Part Number: 0042104F-220
Metric & 115 Volts, 50/60 Hz:	Part Number: 0042104F-M-110
Metric & 230 Volts, 50/60 Hz:	Part Number: 0042104F-M

Dimensions and Weights (Approximate)

Length:	400mm (15.75")
Width:	305mm (12")
Height:	305mm (12")
Weight:	8.2 kgs. (18 lbs.)

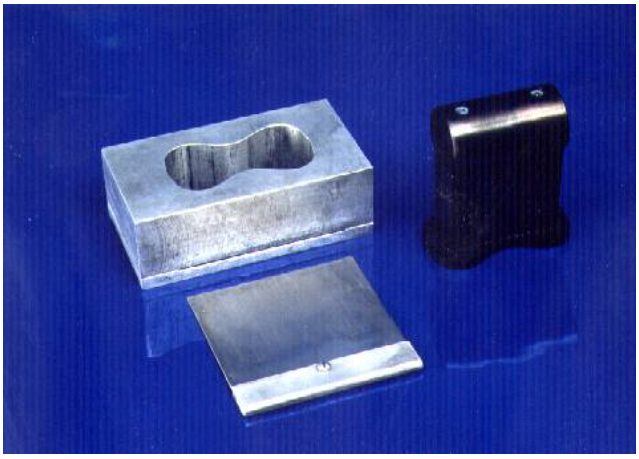
SIMPSON® TECHNOLOGIES

Hot Box Tensile Accessory

Description

Model 42104G

The *Hot Box Tensile Accessory* allows the *Shell Tensile Strength Accessory, Model No. 42104F,* and *Electronic Universal Sand Strength Machine, Model No. 42104* to determine hot tensile strength of hot box sand mixtures.



Testing Standards

AFS:	Part Number: 0042104G
Metric:	Part Number: 0042104G-M

Dimensions and Weights (Approximate)

Length:	102mm (4”)
Width:	64mm (2.5”)
Height:	89mm (3.5”)
Weight:	2.3 kgs. (5 lbs.)

High Compression Strength Accessory

Description

Model 42104H

This accessory is used with the *Electronic Universal Sand Strength Machine, Model No. 42104*. It increases the force in a compression test up to a strength of 2068N/cm^2 (3000 psi).

Testing Standards

AFS:	Part Number: 0042104H
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	254mm (10”)
Width:	127mm (5”)
Height:	203mm (8”)
Weight:	2.7 kgs. (6 lbs.)

SIMPSON® TECHNOLOGIES

Core Transverse Strength Accessory

Description

Model 42104K

This accessory attaches to the *Electronic Universal Sand Strength Machine, Model No. 42104,* and holds the standard core sand transverse sand specimens for transverse strength testing.

Testing Standards

AFS:	Part Number: 0042104K
Metric:	Part Number: 0042104K-M

Dimensions and Weights (Approximate)

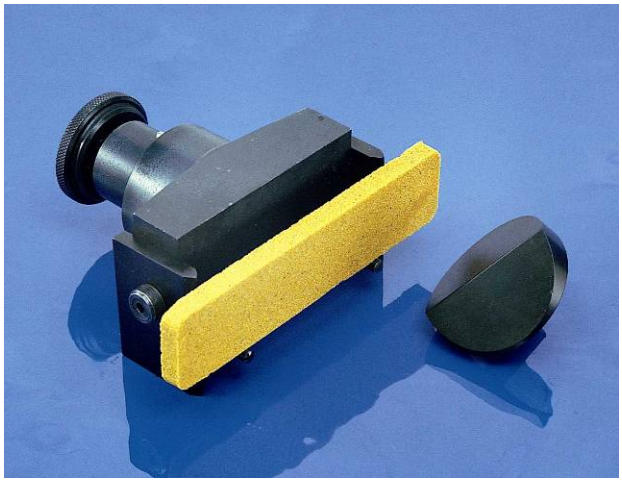
Length:	165mm (6.5”)
Width:	64mm (2.5”)
Height:	89mm (3.5”)
Weight:	1.5 kgs. (3.3 lbs.)

Shell Transverse Strength Accessory

Description

Model 42104L

This accessory, attached to the *Electronic Universal Sand Strength Machine, Model No. 42104,* breaks shell transverse specimens. The accessory is designed to hold the standard AFS .25” thick transverse sand specimen for transverse strength testing.



Testing Standards

AFS:	Part Number: 0042104L
Metric:	Part Number: 0042104L-M

Dimensions and Weights (Approximate)

Length:	89mm (3.5”)
Width:	38mm (1.5”)
Height:	102mm (4”)
Weight:	1.5 kgs. (3.3 lbs.)

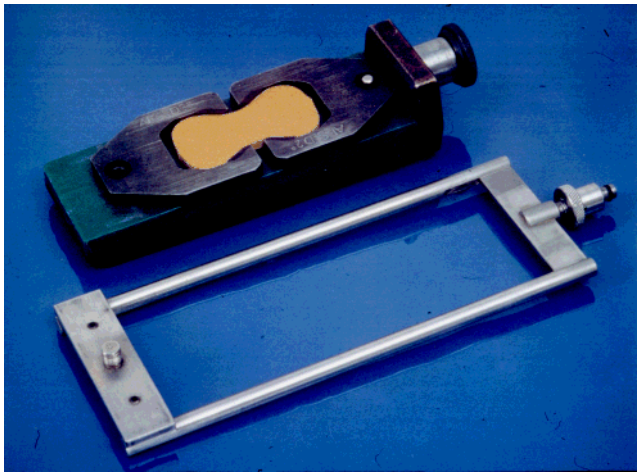
SIMPSON® TECHNOLOGIES

Cold Shell Tensile Strength Accessory

Description

Model 42104N

This accessory to the *Electronic Universal Sand Strength Machine, Model No. 42104,* determines the cold shell tensile strength of a standard AFS .25" thick dog bone specimen. It mounts mechanically to the arm and load cell of the strength machine.



Testing Standards

AFS:	Part Number: 0042104N
Metric:	Part Number: 0042104N-M

Dimensions and Weights (Approximate)

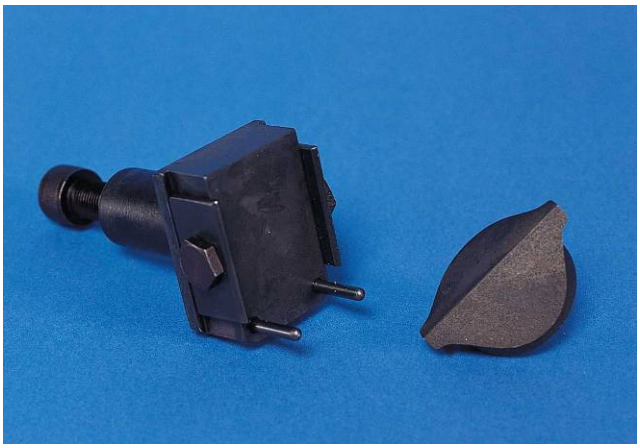
Length:	254mm (10")
Width:	102mm (4")
Height:	64mm (2.5")
Weight:	2 kgs. (4.4 lbs.)

Disk Transverse Accessory

Description

Model 42104P

This accessory to the *Electronic Universal Sand Strength Machine, Model No. 42104,* breaks disc transverse specimens. It includes arm and load cell attachments. The attachments mount mechanically to the arm and load cell of the strength machine.



Testing Standards

AFS:	Part Number: 0042104P
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	70mm (2.75")
Width:	64mm (2.5")
Height:	64mm (2.5")
Weight:	1 kg. (2.2 lbs.)

SIMPSON® TECHNOLOGIES

Digital Absolute Permmeter

Description

Model 42105

The *Digital Absolute Permmeter,* automatically measures the permeability of a standard 2” x 2” AFS sand specimen (50mm x 50mm metric). The permmeter determines how easily air can pass through the porous material. Permeability is determined by measuring the time required for air at AFS standard volume and pressure to pass through the sand specimen. With the addition of certain accessories, the instrument can determine permeability of sands, cores, coatings, molds and other porous materials. The volume of air is controlled by a constant drum space determined by a timing rod. As the drum falls, a high-precision optical coupler measures the time. The permeability result is calculated and shown on the three-digit display. The unit is fully automatic. Simply place the specimen on the rubber pedestal and press start.

The *Digital Absolute Permmeter* includes the pneumatic regulator/filter, pneumatic hose and connectors to connect the supplied regulator to the permmeter.

Specifications

Power Requirements:	115/230 Volts,50-60 Hz
Compressed Air:	2.5 to 4.5 bar (36-65 psi)

Testing Standards

AFS:	Part Number: 0042105-ASM
Metric:	Part Number: 0042105-M-ASM

Dimensions and Weights (Approximate)

Length:	260mm (10.25”)
Width:	362mm (14.25”)
Height:	521mm (20.5”)
Weight:	21.8 kgs. (48 lbs.)

Accessories

42105A	Shell Permeability Accessory, see page 13
42105B	Mold Permeability Accessory, see page 13
42105C	Base Permeability Accessory, see page 14
42105D	Additional Permeability Accessory, see page 14

Replacement Parts

Rubber Pedestal:	Part Number: 0046034

SIMPSON® TECHNOLOGIES

Shell Permeability Accessory

Description

Model 42105A

This accessory measures the permeability of shell sand samples. The sand specimen is held in a metal fixture by a flexible ring. This assembly is attached to the *Digital Absolute Permmeter, Model No. 42105,* for testing. The shell permeability sample pieces are made in the *Test Pieces Blower, Model No. 42109*.

Testing Standards

AFS:	Part Number: 0042105A
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Diameter:	57mm (2.25”)
Height:	76mm (3”)
Weight:	0.5 kgs. (1 lb.)

Mold Permeability Accessory

Description

Model 42105B

This accessory measures the permeability of an actual production mold or core. One end of the accessory fits on the pedestal of the *Digital Absolute Permmeter, Model No. 42105,* and the other is pressed firmly against the surface to be tested.

Testing Standards

AFS:	Part Number: 0042105B
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Diameter:	57mm (2.25”)
Length:	914mm (36”)
Weight:	0.3 kgs. (.65 lbs.)

SIMPSON® TECHNOLOGIES

Base Permeability Accessory

Description

Model 42105C

This accessory to the *Digital Absolute Permmeter, Model No. 42105,* tests the base permeability of dry sands. It consists of a calibrated metal tube, screen, and compacting weight. The tube is filled and the compacting weight is placed on top of the sand. This assembly is tapped until the compacting weight finishes settling and the sand has achieved its maximum density. Then the weight and top portion of the tube are removed and the excess sand is struck off. The remaining assembly and sand specimen are installed on the *Digital Absolute Permmeter, Model No. 42105* and measured to determine the base sands permeability.

Testing Standards

AFS:	Part Number: 0042105C
Metric:	Part Number: 0042105C-M

Dimensions and Weights (Approximate)

Diameter:	64mm (2.5”)
Height:	222mm (8.75”)
Weight:	1 kg. (2.2 lbs.)

Additional Permeability Accessory

Description

Model 42105D

This accessory to the *Digital Absolute Permmeter, Model No. 42105,* tests the permeability of refractory coatings applied to cores and molds. The permeability of an uncoated sand sample is first determined, then the coating can be applied and the new permeability can be measured. The result is the permeability of the coating.

Testing Standards

AFS:	Part Number: 0042105D
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	102mm (4”)
Width:	102mm (4”)
Height:	121mm (4.75”)
Weight:	0.7 kgs. (1.5 lbs.)

Laboratory Sifter

Description

Model 42106

The *Laboratory Sifter* is used to determine the fineness of foundry sands. The sifter is designed to hold up to 11 standard half-height, 8-inch or 200mm diameter sieves. The *Sand Testing Sieves, Model No. 42106A* are purchased separately. A sieve analysis is used to check sand particle size and distribution and to calculate the AFS grain fineness number and surface area. The sifter consists of an electromagnetic vibrator and controls for regulating vibration intensity and frequency. A built-in digital timer controls the shaking time. (Note: sieves are sold separately and listed below.)

Specifications

Power Requirements:	115 Volts, 50-60 Hz	Part Number: 0042106
	230 Volts, 50-60 Hz	Part Number: 0042106-220

Dimensions and Weights (Approximate)

Length:	305mm (12”)
Width:	362mm (14.25”)
Height:	800mm (31.5”)
Weight:	39.1 kgs. (86 lbs.)

Accessories

42106A	Sand Testing Sieves, see below
42106B	1/8” Microsplitter, see page 16
42106E	1/2” Riffle Splitter, see page 16

Sand Testing Sieves

Description

Model 42106A

The *Sand Testing Sieves* are used with the *Laboratory Sifter, Model No. 42106* for determining the AFS grain fineness number and for the distribution of molding and core sands. Included are a nest of AFS sand testing sieves consisting of U.S.A. sieve numbers 6, 12, 20, 30, 40, 50, 70, 100, 140, 200, 270 and a pan. For the nest of metric (DIN standard) sand testing sieves, the mesh sizes are 1.4mm, 1.0mm, 0.71mm, 0.5mm, 0.355mm, 0.25mm, 0.18mm, 0.125mm, 0.09mm, 0.063mm and pan. Other sieve seizes and configurations are available upon request.

Testing Standards

AFS:	Part Number: 0042106A
Metric:	Part Number: 0042106A-M

Dimensions and Weights (Approximate)

Diameter:	203mm (8”)
Height:	330mm (13”)
Weight:	5.5 kgs. (12 lbs.)

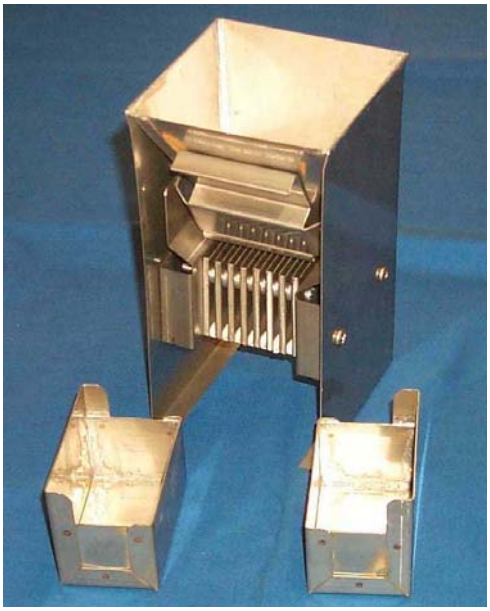
SIMPSON® TECHNOLOGIES

1/8” Microsplitter

Description

Model 42106B

The *1/8” Microsplitter* is used to prepare a representative sample of unbonded foundry sands for sieve analysis testing. Sixteen 1/8” chutes obtain representative sand samples of 125 grams or smaller. The sand poured down the splitter is divided in half with each pass. This reduction technique will yield a representative size sample of the sand for testing.



Testing Standards

AFS:	Part Number: 0042106B
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	114mm (4.5”)
Width:	114mm (4.5”)
Height:	203mm (8”)
Weight:	1.8 kgs. (4 lbs.)

1/2” Riffle Splitter

Description

Model 42106D

The sand splitter allows the laboratory a quick and easy method of obtaining small representative samples of unbonded foundry sands. If sand splitters are not incorporated in sampling procedures, erroneous test data may result. The *1/2” Riffle Splitter* is used to prepare a representative sample of unbonded foundry sands for sieve analysis testing. Fourteen 1/2” chutes divide the sand accurately in half to provide representative sand samples down to 125 grams. The *1/8” Microsplitter, Model No. 42106B* (see above) is needed in conjunction with the *1/2” Riffle Splitter* to accurately obtain representative size sand sample small enough for sieve analysis testing.

Testing Standards

AFS:	Part Number: 0042106D
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	381mm (15”)
Width:	292mm (11.5”)
Height:	356mm (14”)
Weight:	7.7 kgs. (17 lbs.)

SIMPSON® TECHNOLOGIES

Methylene Blue Clay Tester

Description

Model 42108

The *Methylene Blue Clay Tester* is used to determine the amount of live bentonite clay present in a sand sample. A five-gram sand sample is washed in a sodium pyrophosphate solution in the *Ultrasonic Cleaner, Model No. 42108B*. Then methylene blue dye is added to the sample until the clay cannot absorb the excess. Using a calibration factor and milliliters of dye to titrate the sample, the percentage of live bentonite in the molding sand can easily be calculated. The test requires the *Ultrasonic Cleaner, Model No. 42108B*.

The *Methylene Blue Clay Tester* consists of a burette with filling and overflow flasks, one stainless steel beaker, electric mixer and agitator blade, a cast base, a repetition pipette, required chemicals, dropper rod and filter paper.

For more information on controlling clay in a sand system, see the article, *"The Fundamentals of Green Sand Preparation and Control,"* located on our web site at www.simpsongroup.com.

Specifications

115 Volts, 50-60 Hz:	Part Number: 0042108-ASM
230 Volts, 50-60 Hz:	Part Number: 0042108-M-ASM

Dimensions and Weights (Approximate)

Length:	25mm (1")
Width:	305mm (12")
Height:	749mm (29.5")
Weight:	20.9 kgs. (46 lbs.)

Accessories

42108B	Ultrasonic Cleaner with digital timer (see page 18)

Ultrasonic Cleaner

Description

Model 42108B

The *Ultrasonic Cleaner* is used with the *Methylene Blue Clay Tester, Model No. 42108,* for scrubbing a sand sample before the addition of methylene blue dye. Sound waves produced by the cleaner radiate as bubbles around the 250 milliliter stainless steel beaker and then implode releasing enormous amounts of energy. This energy is transmitted through the beaker causing an intense cleaning action that removes bentonite from the sand and breaks down colonies or clusters of bentonite. All the bentonite within the sample must be removed from the sand to determine the total methylene blue clay percentage.

The *Ultrasonic Cleaner* comes standard with a digital timer and the ability to heat the water bath up to 60°C (140°F), which offers maximum control of cycle time with clear read-outs and one touch settings. The Ultrasonic Cleaner has a tank capacity of 1.9 liters (0.5 gallons)

Specifications

Power Requirements:	120 Volts, 50-60 Hz	Part Number: 0042108B-ASM
	230 Volts, 50-60 Hz	Part Number: 0042108B-ASM-2
Tank Capacity:	1.9 Liters (0.5 Gallons)	

Dimensions and Weights (Approximate)

	Tank Size:	Overall Dimensions:
Length:	150mm (6”)	250mm (10”)
Width:	140mm (5.5”)	310mm (12”)
Height:	100mm (4”)	290mm (11.5”)
Weight:	5 kgs. (10 lbs.)	

SIMPSON® TECHNOLOGIES

Test Pieces Blower

Description

Model 42109 and 42109MOD

The *Test Pieces Blower* is used to make standard tensile, transverse (except cold box) and hot distortion test pieces. The modified blower is larger to accommodate the larger cold box transverse test pieces as well as the standard tensile, transverse and hot distortion test pieces. Both have been designed to perform similar to plant conditions, since blowing is the most commonly employed ramming method for molding chemically bonded sands. The blower includes both a digital timer and a heater with digital controls. The operation of the instrument is done via a single lever that controls the movement of the tooling and the sand blow. Provided that the necessary core box tooling and accessories are available, test specimens can be prepared for:

- Tensile strength - shell sand
- Cold tensile strength hot and warm box
- Transverse strength/hot distortion - shell sand
- Cold tensile strength cold box or silicate (special tooling is required for blowing and gassing specimens – requires *Cold Box Gassing and Purging Device, Model No. 42109B*).
- Disc transverse strength hot and warm box (special tooling is required for sample preparation – requires *Disc Transverse Tooling, Model No. 42109C*).
- Disc transverse strength cold box or silicate (special tooling is required for sample preparation – requires *Disc Transverse Tooling, Model No. 42109C* and *Cold Box Gassing/Purging Device, Model No. 42109B*).
- 1.125" x 2" cylindrical specimen for preparation of cold box specimen for the high temperature compression strength and deformation test (requires *Cold Box Gassing/Purging Device, Model No. 42109B* and *1.125" x 2" Cylindrical Specimen Tooling, Model No. 42109D*).
- The *Modified Test Pieces Blower, Model No. 42109MOD* is required to prepare 1" x 1" x 8" AFS (22.4mm x 22.4mm x 175mm Metric) transverse sand specimens.

The *Test Pieces Blower and Modified Test Piece Blower* includes temperature controller, digital timer, regulator to control blow pressure, sand cartridge, pneumatic regulator/filter, pneumatic lubricator, pneumatic hose and connectors to connect the supplied regulators and lubricators to the blower.

Specifications

Standard Blower

Power Requirements:	115 Volts, 50-60 Hz	Part Number: 0042109-ASM
	230 Volts, 50-60 Hz	Part Number: 0042109-220-ASM

Modified Blower

AFS:	115 Volts, 50-60 Hz	Part Number: 0042109MOD-ASM
AFS:	230 Volts, 50-60 Hz	Part Number: 0042109MOD-A1
Metric:	115 Volts, 50-60 Hz	Part Number: 0042109MOD-M-A1
Metric:	230 Volts, 50-60 Hz	Part Number: 0042109MOD-M-AS

Compressed Air for All Machines: 6.5 bar (94 psi)

Tooling

AFS Core Tensile Strength Tooling	Part Number: 0026-132
AFS Shell Tensile Strength Tooling	Part Number: 206602
AFS Shell Transverse Strength Tooling	Part Number: 206604
AFS Disc Transverse Tooling (not shown)	Part Number: 0042109C
AFS 1.125 x 2" Cylindrical Specimen Tooling (not shown)	Part Number: 0042109D
Metric Core Tensile Strength Tooling	Part Number: 0026-132-M
Metric Shell Tensile Strength Tooling	Part Number: 206603
Metric Shell Transverse Strength Tooling	Part Number: 206605

Dimensions and Weights (Approximate)

Length:	432mm (17")
Width:	406mm (16")
Height:	584mm (23")
Weight:	47.3 kgs. (104 lbs.)

Accessories

- 42109A Catalyst Vaporizer (Page 20)
- 42109B Cold Box Gassing/Purging Device (Page 20)

SIMPSON® TECHNOLOGIES

Catalyst Vaporizer

Description

Model 42109A

The Catalst Vaporizer connects to the Test Piece Blower, Model 42109, or the Modified Test Piece Blower, Model 42109MOD, in order to control the gassing and purging sequence of the test specimen via the included electronic cables and supply lines. The apparatus has a built-in PLC and digital temperature controls to accurately and efficiently control the amine gas generation and the sequencing of the user defined blowing and purging cycles. Please note that this device is designed for triethylamine (TEA) or dimethylethylamine (DMEA).

Specifications

Power Requirements:	115 Volts, 50-60 Hz	Part Number: 0042109A-ASM
	220 Volts, 50-60 Hz	Part Number: 0042109A-220

Compressed Air for All Machines: 6.5 bar (94 psi)

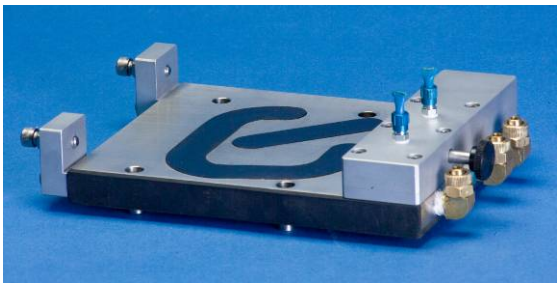
Dimensions and Weights (Approximate)

Length:	114mm (4.5”)
Width:	114mm (4.5”)
Height:	203mm (8”)
Weight:	1.8 kgs. (4 lbs.)

Cold Box Gassing/Purging Device

Description

Model 42109B



The *Cold Box Gassing/Purging Device* attaches to the tooling of the *Test Piece Blower, Model 42109,* and *Modified Test Piece Blower, Model 42109MOD,* in order to produce cold box (gas curred) test specimens. The device is required to properly disperse curing gas into the specimen and then flush the specimen with a purging gas.

Specifications

AFS:	Part Number: 0042109B
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	381mm (15”)
Width:	292mm (11.5”)
Height:	356mm (14”)
Weight:	7.7 kgs. (17 lbs.)

SIMPSON® TECHNOLOGIES

Laboratory Muller

Description

Model 42110

The *Laboratory Muller* is used to prepare mixtures of clay bonded foundry sands. The muller incorporates two vertical mulling wheels on independent suspensions. Plows turn the sand mixture over and direct fresh material into the path of the mullers. The muller weight can be adjusted by a single load spring. The muller has a capacity of 4.1 kgs. (9 lbs.) of silica molding sand and operates with a 0.75 horsepower motor. The mixing bowl dimensions are 394mm (15.5”) inside diameter x 216mm (8.5”) deep.

Specifications

Standard Construction (Cast Iron & Steel)
115 Volts, 50-60 Hz: Part Number: 0042110-ASM
220 Volts, 50-60 Hz: Part Number: 0042110-2-ASM

Stainless Steel Construction: Standard Discharge
115 Volts, 50-60 Hz: Part Number: 0042110S-ASM
220 Volts, 50-60 Hz: Part Number: 0042110S-2-ASM

Stainless Steel Construction: Special Discharge
115 Volts, 50-60 Hz: Part Number: 0042110SA-ASM
220 Volts, 50-60 Hz: Part Number: 0042110SA-2-ASM

Dimensions and Weights (Approximate)

Length:	508mm (20”)
Width:	533mm (21”)
Height:	457mm (18”)
Weight:	100 kgs. (220 lbs.)

SIMPSON® TECHNOLOGIES

Laboratory Core Sand Mixer

Description

Model 42111

The *Laboratory Core Sand Mixer* is designed to mix liquid binders with sand that is common to all chemically bonded sand mixtures. The mixer incorporates an “S” shaped mixing blade that completely mixes the complete sand mass. The mixer has a capacity of 4.1 kgs. (9 lbs.) of silica sand and operates with a 0.75 horsepower motor.

Specifications

115 Volts, 50-60 Hz:	Part Number: 0042111-ASM
220 Volts, 50-60Hz:	Part Number: 0042111-2-ASM

Dimensions and Weights (Approximate)

Length:	521mm (20.5”)
Width:	273mm (10.75”)
Height:	324mm (12.75”)
Weight:	50 kgs. (110 lbs.)

SIMPSON® TECHNOLOGIES

Wet Tensile Strength Tester

Description

Model 42112

The *Wet Tensile Strength Tester* determines tensile strength of the condensation zone that is created in all clay bonded molds during and after pouring. The wet tensile strength is determined by pulling a detachable ring from a special specimen tube. The specimen tube with the detachable ring in position is loaded with molding sand and compacted to the proper specimen height using a *Sand Rammer, Model No. 42100*, *Pneumatic Sand Squeezer, Model No. 42117 or the Digital Pneumatic Squeezer, Model No 42160*. After the start button is pressed, an elevation table raises the specimen tube. The heating plate generates steam at the sand heater interface and a temperature gradient through the sand specimen. The steam is driven away from the heating plate through the porosity of the specimen. This water vapor migrates back into the specimen to a temperature zone where it condenses. This condensation zone is known as the wet layer. After a selected time elapses, the elevation table lowers applying a tensile load to the sand specimen. Since the wet layer is the weakest area of the specimen, when a load is applied the specimen breaks at that point. The load required to break this wet layer is the wet tensile strength. The instrument is fully automatic and displays the tensile results in an easy to read digital display.

The *Wet Tensile Strength Tester* includes the specimen tube and detachable ring, pneumatic regulator/filter, pneumatic hose and connectors to connect the supplied regulator/filter to the instrument.

Testing Standards & Specifications

AFS & 115 Volts, 50-60 Hz:	Part Number: 0042112-ASM
AFS & 220 Volts, 50-60 Hz:	Part Number: 0042112-ASM-220
Metric & 110 Volts, 50-60Hz:	Part Number: 0042112-M-ASM-1
Metric & 220 Volts, 50-60 Hz:	Part Number: 0042112-M-ASM
Compressed Air for All Machines:	6.5 bar (94 psi)

Dimensions and Weights (Approximate)

Length:	445mm (17.5”)
Width:	311mm (12.25”)
Height:	483mm (19”)
Weight:	50 kgs. (110 lbs.)

SIMPSON® TECHNOLOGIES

Calibration Kit

Description

Model 42113

The *Calibration Kit* includes the required fixtures and calibration standards to periodically calibrate the Simpson *Sand Rammer, Model No. 42100, Pneumatic Squeezer, Model No. 42117, Digital Pneumatic Squeezer, Model 42160, Digital Absolute Permmeter, Model No. 42105, Electronic Universal Sand Strength Machine, Model No. 42104,* and the *Wet Tensile Strength Tester, Model No. 42112.*

Testing Standards

AFS:	Part Number: 0042113
Metric:	Part Number: 0042113-M

Dimensions and Weights (Approximate)

Length:	451mm (17.75”)
Width:	305mm (12”)
Height:	102mm (4”)
Weight:	6.8 kgs. (15 lbs.)

Hot Distortion Tester

Description

Model 42114

When a mold or a core is suddenly heated by contacting a liquid metal, it distorts. This distortion may cause casting quality problems such as veining, broken molds or cores, mold wall movement and difficulties maintaining critical dimensions. Therefore, it is important to know the performance of these materials during heating. The *Hot Distortion Tester* is specifically designed to rapidly heat and measure any corresponding deflections of a standard transverse sand specimen. During the heating, the sample first expands and deflects upward. After continued heating, the binding material may soften as measured by either a gradual or steep downward relaxation of the sand specimen. The sand specimen will eventually break when the binder is destroyed. The time required to break the specimen is an indication of the binders hot strength. Readings from the curve can be used to provide an indication of the thermal expansion, hot brittleness, burn out rate and thermoplasticity. The deformation is measured during the entire test and is shown on a color monitor. The distortion curve can be printed or stored in the internal memory of the machine. The distortion curve data can also be downloaded into Microsoft® Excel for further statistical evaluation. The instrument also has the capability to accept user defined process control curves entered from the keyboard. The tester uses natural gas to heat the specimen.

The *Hot Distortion Tester* includes a calibration block, printer, pneumatic regulator/filter, pneumatic hose and connectors to connect the supplied regulator/filter to the instrument. **Note**: The unit requires a standard transverse sand specimen. Preparation of the specimens using the *Test Pieces Blower, Model No. 42109,* is highly recommended.

For more information, see the article on hot distortion testing located on our web site at www.simpsongroup.com.

Testing Standards & Specifications

AFS & 115 Volts, 50-60 Hz:	Part Number: 0042114-A-1A
AFS & 220 Volts, 50-60Hz:	Part Number: 0042114-A-2A
Metric & 110 Volts, 50-60 Hz:	Part Number: 0042114-M-1A
Metric & 220 Volts, 50-60 Hz:	Part Number: 0042114-M-2A

Compressed Air for All Machines: 6.5 bar (94 psi)

Dimensions and Weights (Approximate)

Length:	419mm (16.5”)
Width:	635mm (25”)
Height:	298mm (11.75”)
Weight:	47.3 kgs. (104 lbs.)

High Temperature Compression Tester

Description

Model 42115

The *High Temperature Compression Tester* is used to determine the hot properties of clay and/or chemically bonded sand specimens. An electronic load cell and displacement sensor measures hot compressive strength, hot deformation, and restraining load at elevated temperatures. The test results are displayed on a color monitor. The resultant data can be printed and/or stored into the memory of the instrument. When determining hot compression strength, the instrument generates and displays a complete stress-strain curve, and also shows the maximum compressive strength, deformation at maximum strength and maximum deformation. The display also indicates the real time strength and deformation of the sand specimen. An accurate digital controller and indicator regulate the furnace temperature. The furnace is capable of maintaining temperatures up to 2000° F (1093° C). The furnace automatically moves from the specimen loading and testing positions. An automatic timer controls the specimen heating time and activates the press at the end of the selected soak time. The instrument is capable of using both AFS and metric sand testing standards. The *High Temperature Compression Tester* can be fitted with a *Controlled Atmosphere Testing Accessory, Model No. 42115A*. This feature allows for hot compression testing in a controlled atmosphere.

The *High Temperature Compression Tester* includes a printer, 3 sets of specimen supports, pneumatic regulator/lubricator/filter, pneumatic hose and connectors to connect the supplied regulator/ lubricator/filter to the instrument, cooling pump, coolant reservoir. Note: The unit requires a standard 1.125” x 2.0” cylindrical sand specimen. The *Hot Properties Sand Rammer, Model No. 42116* is required for preparation of the sand specimens using clay binders. The *Test Pieces Blower, Model No. 42109* and the *1.125" x 2" Cylindrical Specimen Tooling, Model No. 42109D* are required for preparation of the sand specimens using chemically bonded sands.

Testing Standards & Specifications

AFS/Metric & 115 Volts, 50-60 Hz:	Part Number: 0042115-ASM
AFS/Metric & 230 Volts, 50-60 Hz:	Part Number: 0042115-220-ASM
Compressed Air for All Machines:	5.5 bar (80 psi)

Dimensions and Weights (Approximate)

Length:	1,041mm (41”)
Width:	400mm (15.75”)
Height:	940mm (37”)
Weight:	80 kgs. (176 lbs.)

Accessories

42115A	Controlled Atmosphere Testing Accessory (not shown)

Hot Properties Rammer

Description

Model 42116

The *Hot Properties Rammer* is used to make standard clay bonded sand specimens for the *High Temperature Compression Tester, Model No. 42115*. The rammer includes a specimen tube, specimen tube key, stripping post, pneumatic regulator/filter/lubricator, pneumatic hose and connectors to connect the regulator/filter/lubricator to the rammer.

Specifications

Compressed Air:	6.5 bar (94 psi)

Testing Standards

AFS:	Part Number:	0042116-ASM
Metric:	Part Number:	Not Applicable – Universal adapter kit included

Dimensions and Weights (Approximate)

Length:	203mm (8”)
Width:	229mm (9”)
Height:	660mm (26”)
Weight:	20 kgs. (44 lbs.)

SIMPSON® TECHNOLOGIES

Pneumatic Sand Squeezer

Description

Model 42117

The *Pneumatic Sand Squeezer* is used to prepare standard 2” x 2” AFS sand specimens (50mm x 50mm metric) and to determine the compactability of prepared molding sand. The standard sand specimen is used in various tests including permeability, compressive strength, shear strength, friability, etc. (See the *Equipment Selection Chart* on page iv for more details.) The sand squeezer can be a replacement for the standard 3-ram method of making sand specimens using the *Sand Rammer, Model No. 42100*. The squeezer is considered more representative of molding machines that utilize high pressure squeezing. Two measurement scales are provided on the main stem of the squeezer. One scale is for measuring compactability and another for measuring the final specimen height. The scales can also be used to determine the proper sample weight required for preparation of a standard sand specimen. The unit includes an air pressure regulator for the operator to change the compacting pressure.

The instrument includes a stripping post, specimen tube, tube pedestal, pneumatic regulator/filter/lubricator, pneumatic hose and connectors to connect the supplied regulator to the squeezer. Note: The *Tube Filler Accessory, Model No. 42100A* is required with the *Pneumatic Sand Squeezer* to determine the compactability of prepared molding sand.

Specifications

Compressed Air:	6.5 bar (94 psi)

Testing Standards

AFS:	Part Number: 0042117-ASM
Metric:	Part Number: 0042117-M-ASM

Dimensions and Weights (Approximate)

Length:	330mm (13”)
Width:	279mm (11”)
Height:	508mm (20”)
Weight:	18.2 kgs. (40 lbs.)

Accessories

42100A	Tube Filler Accessory, see page 2

SIMPSON® TECHNOLOGIES

Digital Balance

Description

Model 42118

The *Digital Balances*, *Models 42118*, offer a sand laboratory the speed and accuracy required to perform all weighing applications. All balances feature solid construction, a high contrast display and a large scale surface. These balances also feature an automatic tare key, a quick stabilization time of 2-3 seconds and an automatic internal calibration feature. The *Model 42118-04* offers features such as a backlit LCD, internal self-calibration and increased readability. The *Model 42118-4* features increased readability and an easy to use graphical display with data output capabilities and an automatic temperature variable internal calibration.

42118-04

42118-4

Specifications

Part Number	Voltage	Capacity	Readability	Repeatability	Pan Size	Dimensions	Weight
0042118-04-1A	115V	410g	.01g	±0.01g	168mm x 180mm (6.6” x 7.1”)	220mm x 90mm x 30mm (8.7” x 3.3” x 11.8”)	6kg (12lb)
0042118-04-2A	230V	410g	.01g	±0.01g	168mm x 180mm (6.6” x 7.1”)	220mm x 90mm x 30mm (8.7” x 3.3” x 11.8”)	6kg (12lb)
0042118-4-1A	115V	4200g	.01g	±0.01g	190mm x 200mm (7.5” x 7.9”)	230mm x 98mm x 393mm (9.1” x 4” x 15.5”)	7kg (15lb)
0042118-4-2A	230V	4200g	.01g	±0.01g	190mm x 200mm (7.5” x 7.9”)	230mm x 98mm x 393mm (9.1” x 4” x 15.5”)	7kg (15lb)

Rapid Sand Washer

Description

Model 42119

The *Rapid Sand Washer* is used to prepare a sand sample for the *AFS Clay Tester, Model No. 42131*. This washer agitates the sand at a high speed which scrubs the adhering clay from the sand grains. The unit consists of a high speed agitator, timer, and stand and also includes a 1000ml beaker.

Specifications

115 Volts, 50-60 Hz:	Part Number: 0042119
230 Volts, 50-60 Hz	Part Number: 0042119-220

Replacement Parts

1,000 ml beaker:	Part Number: 0045818
Agitator Disk:	Part Number: 0025-121

Dimensions and Weights (Approximate)

Length:	305mm (12”)
Width:	216mm (8.5”)
Height:	216mm (8.5”)
Weight:	5.5 kgs. (12 lbs.)

SIMPSON® TECHNOLOGIES

Mechanical Load Cell

Description

Model 42125

The *Mechanical Load Cell* is used to calibrate loads on the following Simpson laboratory equipment:

- *Electronic Universal Sand Strength Machine, Model No. 42104*
- *Pneumatic Sand Squeezer, Model No. 42117*
  Note: Additional fixtures, *Part No. 0017-721,* are required for mounting the *Mechanical Load Cell.*
- *Digital Pneumatic Sand Squeezer, Model No. 42160*
  Note: Additional fixtures, *Part No. 0017-721,* are required for mounting the *Mechanical Load Cell.*
- *High Temperature Compression Tester, Model No. 42115*
  Note: Additional fixtures are required for alignment of the *Mechanical Load Cell.*

The gauge is calibrated using NIST certified dead weights at three positions. Each mechanical load cell is supplied with certification documentation. Using this mechanical load cell, the *Electronic Universal Sand Strength Machine, Model No. 42104,* can be calibrated in minutes. The incorporation of digital calibration allows the operator to make all necessary corrections via the keyboard without disassembling the strength machine.

The *Mechanical Load Cell* is supplied with the required fixtures for proper mounting on the *Electronic Universal Sand Strength Machine, Model No. 42104.*

Testing Standards

AFS:	Part Number: 0042125
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	191mm (7.5”)
Width:	102mm (4”)
Height:	25mm (1”)
Weight:	1 kg. (2.2 lbs.)

Muffle Furnace

Description

Model 42127

The *Muffle Furnace* is used to determine loss on ignition (LOI) and volatiles on both chemically and clay bonded foundry sands. This data is used to monitor and control organic additives in clay bonded sand such as sea coal, cellulose and cereal and binder percentages in chemically bonded sand.

The furnace temperature is adjustable between 100°C - 1,100°C (212°F - 2,012°F) with the operating temperature displayed on a digital display. The furnace is available in a small size with chamber dimensions of 250mm x 135mm x 140mm (9.8” x 5.3” x 5.5”) or a large size with chamber dimensions of 330mm x 200mm x 200mm (13” x 8” x 8”). Both are equipped with a PID temperature controller which has a large, bright digital LED that will display either the set point or process temperature.

Specifications (Approximate)

Part Number	Voltage	Weight	Chamber Dimensions	Overall Dimensions
0042127-5C-2A	240	37 kgs. (80 lbs.)	250mm x 135mm x 140mm (9.8” x 5.3” x 5.5”)	405mm x 585mm x 375mm (16” x 23” x 14.8”)
0042127-13C-2A	240	58 kgs. . (125 lbs.)	330mm x 200mm x 200mm (13” x 8” x 8”)	610mm x 655mm x 432mm (24” x 25.8” x 17”)

Accessories

42126A	High Temperature Crucibles
206207	Crucible Tongs

Drying Oven

Description

Model 42129

The *Drying Oven* is used to prepare clay bonded molding sands for testing dry sand properties. Dry strength is a measure of resistance to sand inclusion and erosion type defects. The oven can also be used to determine moisture percentage of new sands and prepared molding sands. Washed sand samples can also be dried in this oven.

Each oven includes two adjustable nickel wire plated shelves with multi-position settings and a corrosion resistant polished stainless steel interior. The oven temperature is adjustable in the range of 10°C - 300°C (50°F – 572°F) and features a forced air convection fan. Both ovens include a PID temperature controller which has a large bright LED mounted behind a smooth membrane control panel.

Specifications (Approximate)

Part Number	Voltage	Chamber Capacity	Weight	Chamber Dimensions	Overall Dimensions
215803-301	120	65L	45 kgs. (130 lbs.)	420mm x 400mm x 392mm (16.5” x 15.7” x 15.4”)	570mm x 570mm x 765mm (22.4” x 22.4” x 30.1”)
215804-301	240	65L	45 kgs. (130 lbs.)	420mm x 400mm x 392mm (16.5” x 15.7” x 15.4”)	570mm x 570mm x 765mm (22.4” x 22.4” x 30.1”)
215806-301	120	125L	60 kgs. (176 lbs.)	520mm x 500mm x 492mm (20.5” x 19.7” x 19.4”)	670mm x 670mm x 865mm (26.4” x 26.4” x 34.1”)
215800-301	240	125L	60 kgs. (176 lbs.)	520mm x 500mm x 492mm (20.5” x 19.7” x 19.4”)	670mm x 670mm x 865mm (26.4” x 26.4” x 34.1”)

SIMPSON® TECHNOLOGIES

Moisture Analyzer

Description

Model 42130

The *Moisture Analyzer* is used to determine the moisture content of green sand and other raw materials used within the foundry. Depending upon the unit, at least 25g up to 110g of sand are placed on the drying pan and heated. The analyzer features Halogen drying technology to quickly obtain the moisture content of the material which is automatically calculated and shown on the backlit digital display. The *Model 42130-IA & 42130-IC* offer an advanced digital display with many different drying programs and multiple languages. The *Model 42130-ID* is a high capacity unit with just the essential settings and display for the average user. Each analyzer is supplied with 50 *Drying Pans.*

Model 42130-IA

Model 42130-IC

Model 42130-ID

Specifications

Part Number	Voltage	Capacity	Readability	Dimensions	Weight
0042130-IA	115V	35g	0.02%	190mm x 152mm x 350mm (7.5” x 6” x 14”)	7 kgs. (15 lbs.)
0042130-IA-2	230V	35g	0.02%	190mm x 152mm x 350mm (7.5” x 6” x 14”)	7 kgs. (15 lbs.)
0042130-IC	115V	45g	0.01%	170mm x 130mm x 280mm (6.5” x 5” x 11”)	7 kgs. (15 lbs.)
0042130-IC-2	230V	45g	0.01%	170mm x 130mm x 280mm (6.5” x 5” x 11”)	7 kgs. (15 lbs.)
0042130-ID	115V	110g	0.05%	170mm x 130mm x 280mm (6.5” x 5” x 11”)	4 kgs. (9 lbs.)
0042130-ID-2	230V	110g	0.05%	170mm x 130mm x 280mm (6.5” x 5” x 11”)	4 kgs. (9 lbs.)

Replacement Parts

50 Drying Pans: Part Number: 0042130A
Replacement Bulbs: Part Number: 0042130C
** Note: Replacement bulbs are not considered a warrantee item*

SIMPSON® TECHNOLOGIES

AFS Clay Tester

Description

Model 42131

AFS clay is the percentage of particles with a diameter less than 20 microns in a foundry sand sample. This includes active clay, dead clay, silt and inert fines. The sand sample to be tested must be prepared in the *Rapid Sand Washer, Model No. 42119*. The *AFS Clay Tester* stirs a water and sand mixture into suspension and drains the overlaying liquid after a preset settling time. The time between cycles allows only particles larger than 20 microns to settle. If this process is repeated enough, all particles smaller than 20 microns will be removed. A command panel with a keyboard and a liquid crystal display (LCD) operates the tester. An on-board microprocessor can be programmed by the operator via the LCD for several advanced options, including number of cycles and type of sand to be tested. The AFS clay tester can also adjust settling times to compensate for temperature changes. A thermistor registers the water temperature during each settling period. This data is received by the microprocessor which uses this information to correct the settling time for the next wash.

The *AFS Clay Tester* is shipped with a pressure regulator, connecting hoses and 1000 milliliter beaker. The *AFS Clay Tester* also requires a *Rapid Sand Washer, Model No. 42119* to pre-treat the sand sample prior to testing.

For more information on controlling AFS clay in a sand system, see the article *"The Fundamentals of Green Sand Preparation and Control"* located on our web site at www.simpsongroup.com.

Specifications

Power Requirements:	115/230 Volts, 50-60 Hz
Water Requirements:	Minimum incoming pressure 1.7-2 bar (25-30 psi)

Testing Standards

AFS:	Part Number: 0042131-ASM
Metric:	Part Number: Not Applicable – Universal

Replacement Parts

1,000 ml beaker:	Part Number: 0045818

Dimensions and Weights (Approximate)

Length:	584mm (23")
Width:	343mm (13.5")
Height:	279mm (11")
Weight:	11.4 kgs. (25 lbs.)

SIMPSON® TECHNOLOGIES

Permeability Standard

Description

Model 42132

The *Permeability Standard* is used to verify and calibrate the *Digital Absolute Permmeter, Model No. 42105*. The accuracy of the permmeter can be verified in seconds.

Testing Standards

AFS:	Part Number: 0042132
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

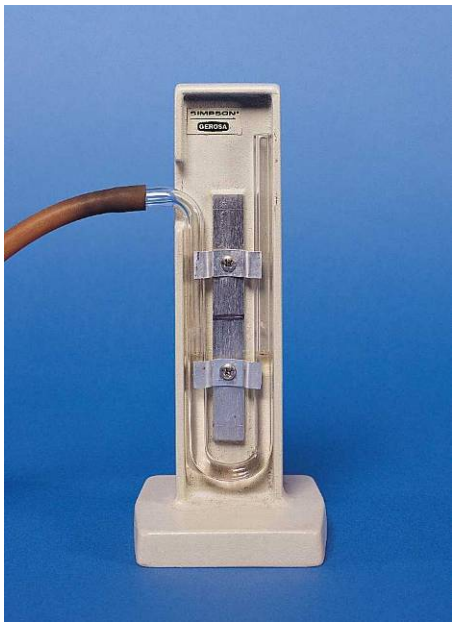
Diameter:	64mm (2.5”)
Height:	121mm (4.75”)
Weight:	1.5 kgs. (3.3 lbs.)

Pressure Manometer

Description

Model 42133

The *Pressure Manometer* is used to calibrate the *Digital Absolute Permmeter*, *Model No. 42105*. The manometer is <u>required</u> to accurately verify and adjust the drum weight on the permmeter.



Testing Standards

AFS:	Part Number: 0042133
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	419mm (16.5”)
Width:	203mm (8”)
Height:	311mm (12.25”)
Weight:	10 kgs. (22 lbs.)

SIMPSON® TECHNOLOGIES

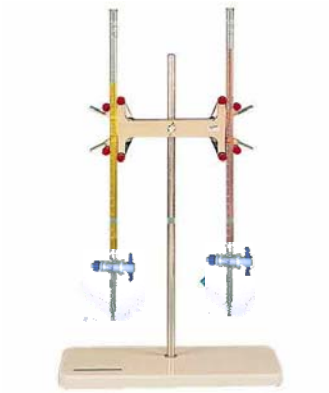
Acid Demand Value (ADV) Test Kit

Description

Model 42136

The *Acid Demand Value (ADV) Test* measures the amount of basic material present in the sand that is soluble in a dilute acid solution. Since the reaction which cures the resin in many chemical binder systems is acid catalyzed, and since the acid is very mild, the presence of the basic material which can neutralize this weak acid will retard the curing reaction. The ADV of the sand should be monitored, since drastic changes can require a catalysts modification.

The *Acid Demand Value (ADV) Test Kit* includes a digital magnetic stirrer, specialized stir wedge, two titrating burettes, heavy duty stand, beaker, dual self zeroing burette kit, advanced pH/mV/temperature meter with electrode and electrode arm kit. Chemicals are not included.



Acid Demand Value (ADV) Test Kits Specifications

115 Volts, 50-60 Hz:	Part Number: 0042136-ASM
230 Volts, 50-60 Hz	Part Number: 0042136-220-ASM

Dimensions and Weights (Approximate)

Depth:	460mm (18”)
Width:	560mm (22”)
Height:	1100mm (44”)
Weight:	25 kgs. (63 lbs.)

SIMPSON® TECHNOLOGIES

Analytical Balance

Description

Model 42137

The *Analytical Balance* is a high precision weighing instrument necessary for several standard AFS or DIN tests requiring high accuracy measurements. These balances feature an oversized chamber, full color graphic display and rugged construction. In addition, the balance incorporates a stability detection system coupled with a quick response time, ensuring efficient use of laboratory time. Each balance includes a sealed keypad, overload and shock protection and fully automatic internal calibration.

Testing Standards & Specifications

Part Number	Voltage	Capacity	Readability	Stabilization Time	Internal Calibration	Pan Size (Dia.)
0042137-1-1A	115V	220g	0.1mg	3	Yes	90mm (3.5")
0042137-1-2A	230V	220g	0.1mg	3	Yes	90mm (3.5")
0042137-2-1A	115V	220g	1mg	3	Yes	90mm (3.5")
0042137-2-2A	230V	220g	1mg	3	Yes	90mm (3.5")

Dimensions and Weights (Approximate)

Part Number	Dimensions	Weight
0042137-1-1A/0042137-1-2A	230mm x 350mm x 393mm (9.1" x 13.8" x 15.5")	9.6 kgs. (22 lbs.)
0042137-2-1A/0042137-2-2A	230mm x 350mm x 393mm (9.1" x 13.8" x 15.5")	9.6 kgs. (22 lbs.)

SIMPSON® TECHNOLOGIES

Friability Tester

Description

Model 42141

The *Friability Tester* is used to determine the surface integrity of the molding sand. The instrument consists of a rotating wire mesh cage which causes two standard 2” x 2” AFS sand specimens (50mm x 50mm metric) to be abraded. The dislodged sand drops through the cage and is weighed. A simple calculation based on the loss and the weight of the two specimens results in the test value. The machine is easy to operate via the digital user interface and requires very little maintenance due to the totally enclosed drive system.

Specifications

Power Requirements:	115/230 Volts, 50-60 Hz

Testing Standards

AFS:	Part number: 0042141
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	318mm (12.5”)
Width:	292mm (11.5”)
Height:	254mm (10”)
Weight:	10 kgs. (22 lbs.)

SIMPSON® TECHNOLOGIES

Electronic Mold Hardness Tester

Description

Model 42142 & 42143

Mold hardness, as determined by this instrument, is the resistance offered by the surface of a prepared sand mold to be penetrated by a loaded plunger. The instrument measures the depth of penetration into a mold surface of a plunger having a load applied at a 90 degree angle to the mold surface.

The instrument is portable, lightweight and easy to operate. It incorporates an LCD display that clearly indicates the hardness number and completely eliminates any operator error associated with reading a mechanical scale. The instrument automatically records the maximum penetration value. The *Electronic Mold Hardness Tester* can be easily calibrated.

Basic Package:
Electronic Mold Hardness Tester
AAA Rechargeable NiMH Battery
Carrying Case

Software Functions:
Store and display date of last calibration
Store and display user name
Basic point to point mode

Mode of Operation:
Point to Point Mode - Allows the operator to measure and record one mold hardness reading per test. The basic *Electronic Mold Hardness Tester* cannot store any data in memory. This instrument will display, for a defined time, the resultant mold hardness value in the LCD. (For memory storage of data, see information on our advanced model, page 41).

For more detailed information, visit our web site at www.simpsongroup.com.

Specifications

Power Requirements:	AAA Rechargeable NiMH Battery (battery charger not included)

Testing Standards

AFS, B-Scale:	Part Number: 0042142
AFS, C-Scale:	Part Number: 0042143
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	102mm (4”)
Width:	64mm (2.5”)
Height:	32mm (1.25”)
Weight:	Tester only - 0.17 kgs. (0.37 lbs.)

SIMPSON TECHNOLOGIES

Advanced Electronic Mold Hardness Tester

Description

Model 42142ADV & 42143ADV

Model No. 42142ADV - B-Scale
Model No. 42143ADV - C-Scale

Mold hardness, as determined by this instrument, is the resistance offered by the surface of a prepared sand mold to be penetrated by a loaded plunger. The instrument measures the depth of penetration into a mold surface of a plunger having a load applied at a 90 degree angle to the mold surface. The advanced model allows you advanced software function and the ability to download up to 900 data points to a computer for analysis.

The instrument is portable, lightweight and easy to operate. It incorporates an LCD display that clearly indicates the hardness number and completely eliminates any operator error associated with reading a mechanical scale. The instrument automatically records the maximum penetration value. The instrument can be easily calibrated.

Advanced Feature Kit

Advanced Package: Functions:	Software
Electronic Mold Hardness Tester	Store and display date of last calibration
Advanced Software Package	Store and display user name
AAA Rechargeable NiMH Battery	Basic point to point mode
Computer Software Package	Auto average mode
Infrared Receiver Box & Board	Scan mode
Cables	Store up to 900 data points
Calibration Fixture	Identify up to 32 molds
Carrying Case	Digital calibration of displacement
	Infrared data transfer to computer

Modes of Operation:

- *Point to Point Mode* - Has the ability to store the mold hardness value in memory. The memory can store up to 900 data points categorized by up to 32 user defined mold or core ID numbers and/or names. The stored data can then be transferred to a computer via infrared link. The memory can be cleared or retained after downloading.
- *Auto Average Mode* - Allows the operator to measure mold hardness at several different locations on the mold surface. The instrument will automatically display the number of test points and average mold hardness for that group of data. This feature is only available on the *Advanced Electronic Mold Hardness Tester*. The information can also be stored in memory and downloaded to a computer.
- *Scan Mode* - Allows the operator to determine a hardness gradient over a defined plane of a mold. For instance, the operator can measure the hardness at several points up or down a vertical surface of a mold and determine the change of hardness. This information can be gathered and displayed as gradient lines by plotting the depth vs. hardness numbers. The scan information can also be stored in memory and downloaded to a computer.

For more detailed information, visit our web site at www.simpsongroup.com.

Specifications

Power Requirements:	AAA Rechargeable NiMH Battery (battery charger not included)
Software Requirements:	IBM Compatible, Windows Software

Testing Standards

AFS, B-Scale:	Part Number: 0042142ADV
AFS, C-Scale:	Part Number: 0042143ADV
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	102mm (4”)
Width:	64mm (2.5”)
Height:	32mm (1.25”)
Weight:	Tester only - 0.17 kgs. (0.37 lbs.)

SIMPSON® TECHNOLOGIES

Electronic Scratch Hardness Tester

Description

Model 42145

The scratch hardness of a mold or core is determined using this instrument. The instrument incorporates a four point cutter that penetrates a finished core or mold surface when rotated. The depth of penetration of the cutter into the specimen determines the hardness of the core or mold. The use of advanced electronics increases the accuracy of the instrument. The *Electronic Scratch Hardness Tester* is lightweight, portable and engineered for foundry use.

Package Includes:
Electronic Scratch Hardness Tester
Carrying Case
Computer Software Package
Infrared Receiver Box And Board
Cables
Calibration Fixture

Software Functions:
Store and display date of last calibration
Store and display user name
Point to point mode
Store up to 900 data points
Identify up to 32 molds
Digital calibration of displacement
Infrared data transfer to computer

Mode of Operation:
The instrument will automatically record the hardness number every 360 degrees of cutter rotation. This instrument will display, for a defined time, the resultant scratch hardness value in the LCD.

Specifications

Power Requirements:	AAA Rechargeable NiMH Battery (battery charger not included)
Software Requirements:	IBM Compatible, Windows Software

Testing Standards

AFS:	Part Number: 0042145
Metric:	Part Number: Not Applicable - Universal

Dimensions and Weights (Approximate)

Length:	140mm (5.5”)
Width:	64mm (2.5”)
Height:	32mm (1.25”)
Weight:	Tester only - 0.25 kgs. (0.55 lbs.)

SIMPSON® TECHNOLOGIES

Desiccator & Accessories

Description

Model 42147

In order to control hygroscopic and other contamination during the cooling of samples after heating in the Model 42127 Muffle Furnace, we offer several different dissector options and accessories.

The Desiccator Chamber (PN: 0042147) features a sealed glass lid and glass vertical walls and bottom. It also includes a porcelain plate with desiccant storage area below (desiccant sold separate).

The Desiccator Cabinets (PN 0042147-JA & 0042147-JB) feature a stainless steel frame and two stainless steel shelves with an included desiccant tray (desiccant sold separate). There is also a manual relief valve that allows the equalization of the chamber pressure prior to opening the door.

The reusable desiccant is available in two sizes (0.45kg (1 lb.) and 2.25kg (5 lbs.)) and changes color as it absorbs moisture and will change back to blue from pink when heated to 218°C (424.5 °F) for one hour.

Part Number: 0042147

Part Number: 0042147-JA & 0042147-JB

Part Number: 206207

Specifications

Part Number	Description	Dimensions	Construction
0042147	Desiccator Chamber	Inside Diameter 200mm (7.8”)	Glass and Porcelain
0042147-JA	Small Desiccator Cabinet	310mm x 320mm x 310mm (12.25” x 12.5” x 12.25”)	Glass and Stainless Steel
0042147-JB	Large Desiccator Cabinet	56.5mm x 42mm x 58mm (22.25” x 16.5” x 23”)	Glass and Stainless Steel

Accessories

Reusable Desiccant 0.45kg (1 lb):	Part Number: 0042147A
Reusable Desiccant 2.25kg (5 lbs.):	Part Number: 0042147B
Julian Style Tongs:	Part Number: 206207

SIMPSON® TECHNOLOGIES

Melt Point Tester

Description

Model 42152

This test instrument measures the melt point or stick point of shell resin coated sands. The melt point of shell resin refers to the heat sensitivity of the resin coating on the sand and indicates the lowest temperature at which the coating becomes soft or tacky enough to adhere to itself or other surfaces. The test is useful for incoming quality control, production control of the sand coating process as well as determining the suitability of sands for a production application.

The test apparatus consists of a heated bar in which a temperature gradient is established so that the left end of the bar is cooler than the right. The temperature gradient of the bar can be controlled. To make a test, the sand sample is loaded into a specially designed traveling hopper. When a test is started, the instrument automatically opens the sand hopper and moves it left to right at a controlled travel speed. While traveling, the hopper delivers a very controlled amount of shell sand onto the heated bar. After a predetermined time the instrument automatically blows a gentle jet of air starting from the cool end towards the hot end of the bar. At the point where the sand resists being blown off, a thermocouple tip aligned by laser is applied to the surface of the heated bar. The temperature measured at this point on the heated bar is the melt point of the sand sample. The Simpson *Melt Point Tester* automatically controls the bar temperature and the loading and unloading of the heated bar which reduces the operator influence on the test results.

The *Melt Point Tester* includes pneumatic regulator/filter, blow off sample tray, pneumatic hose and connectors to connect the supplied regulator/filter to a compressed air source.

Testing Standards & Specifications

AFS & 115 Volts:	Part Number: 0042152-ASM
AFS & 230 Volts:	Part Number: 0042152-220-ASM
Metric:	Not Applicable – This part is universal
Compressed Air for All Machines:	6.5 bar (94 psi)

Dimensions and Weights (Approximate)

Length:	635mm (25”)
Width:	381mm (15”)
Height:	280mm (11”)
Weight:	25.4 kgs. (56 lbs.)

Shatter Index Tester

Description

Model 42159

The shatter index test 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.

The sample tube containing the prepared sample (AFS 2” x 2” or metric 50mm x 50mm) is prepared and placed in the sample tube holder on the apparatus. The device is then activated via an automatic control knob that pneumatically retracts the specimen tube while restraining the specimen. The retraction of the specimen tube allows the sample to be dropped from a set distance with an initial velocity of zero. By utilizing this automated design, the operator influence that normally dictates the starting velocity in older designs is eliminated and the sample has a controlled and constant descent until contacting the anvil. Once the sample impacts the anvil, the degenerated sand falls through the screen and is collected in the custom molded catch pan for analysis.

The *Shatter Index Tester* includes a centering plumb bob for leveling, pneumatic regulator/filter, sample tray, pneumatic hose and connectors to connect the supplied regulator/filter to a compressed air source.

Specifications

Compressed Air:	6.5 bar (94 psi)

Testing Standards

AFS:	Part Number: 0042159
Metric:	Part Number: Not Applicable – Universal adapter kit included

Dimensions and Weights (Approximate)

Length:	559mm (22”)
Width:	457mm (18”)
Height:	2311mm (91”)
Weight:	44.8 kgs. (115 lbs.)

Digital Pneumatic Sand Squeezer

Description

Model 42160

The Digital *Pneumatic Sand Squeezer* is used to prepare standard 2” x 2” AFS sand specimens (50mm x 50mm metric) and to determine the compactability of prepared molding sand. The standard sand specimen is used in various tests including permeability, compressive strength, shear strength, friability, etc. (See the *Equipment Selection Chart* on page iv for more details.) The sand squeezer can be a replacement for the standard 3-ram method of making sand specimens using the *Sand Rammer, Model 42100*. The squeezer is considered more representative of molding machines that utilize high pressure squeezing. The compactability and displacement are automatically calculated and digitally displayed after the cylinder compresses the sample along with the squeeze pressure that is operator configurable via the included pneumatic regulator.

The instrument includes a stripping post, specimen tube, tube pedestal, pneumatic regulator/filter/lubricator, pneumatic hose and connectors to connect the supplied regulator to the squeezer. **Note**: The *Tube Filler Accessory, Model 42100A* is required with the *Digital Pneumatic Sand Squeezer* to determine the compactability of prepared molding sand.

Specifications

Power Requirements:	Universal – 115/230 Volts, 50- 60 Hz
Compressed Air:	6.5 bar (94 psi)

Testing Standards

AFS:	Part Number: 0042160-ASM
Metric:	Part Number: 0042160-M-ASM

Dimensions and Weights (Approximate)

Length:	330mm (13”)
Width:	279mm (11”)
Height:	508mm (20”)
Weight:	25.9 kgs. (57 lbs.)

Accessories

Model No. 42100A	Tube Filler Accessory *(See Page 2)*

Calibration

Model No. 42125	Mechanical Load Cell *(See Page 30)*

Appendix

Simpson Green Sand Testing Laboratory – Level 1

Qty.	Model No.	Description	Level
1	*42100	Sand Rammer	1
1	42100A	Tube Filler Accessory	1
1	*42100C	Sand Rammer Base	1
1	*42100D	Sand Rammer Pedestal	1
1	42104	Electronic Universal Sand Strength Machine	1
1	42105	Digital Absolute Permmeter	1
1	42108	Methylene Blue Clay Tester	1
1	42108B	Ultrasonic Cleaner	1
1	42118	Digital Balance	1
1	42119	Rapid Sand Washer	1
1	42127	Muffle Furnace	1
1	42129	Drying Oven	1
1	42130	Moisture Analyzer	1
1	42131	AFS Clay Tester	1
1	42142	Mold Hardness Tester (B-Scale)	1

*Can substitute a Pneumatic Sand Squeezer (42117) or a Digital Pneumatic Sand Squeezer (42160) instead of the Sand Rammer (42100), Sand Rammer Base (42100C) and Sand Rammer Pedestal (42100D).

Additions for Core Testing Laboratory – Level 1

Additions for Shell Testing on Page 53

Qty.	Model No.	Description	Level
1	42104C	Cold Tensile Strength Accessory	1
		or	
1	42104K	Transverse Strength Accessory	1

Recommended Calibration Accessories – Level 1

Qty.	Model No.	Description	Level
1	42125	Mechanical Load Cell	1
1	42132	Permeability Standard	1

Simpson Green Sand Testing Laboratory – Level 2

Qty.	Model No.	Description	Level
1	*42100	Sand Rammer	1
1	42100A	Tube Filler Accessory	1
1	*42100C	Sand Rammer Base	1
1	*42100D	Sand Rammer Pedestal	1
1	42104	Electronic Universal Sand Strength Machine	1
1	42104E	Green Deformation Accessory	2
1	42105	Digital Absolute Permmeter	1
1	42105C	Base Permeability Accessory	2
1	42106	Laboratory Sifter	2
1	42106A	Sieves	2
1	42106B	1/8" Microsplitter	2
1	42106D	1/2" Riffle Splitter	2
1	42108	Methylene Blue Clay Tester	1
1	42108B	Ultrasonic Cleaner	1
1	42118	Digital Balance	1
1	42119	Rapid Sand Washer	1
1	42127	Muffle Furnace	1
1	42129	Drying Oven	1
1	42130	Moisture Analyzer	1
1	42131	AFS Clay Tester	1
1	42142	Electronic Mold Hardness Tester (B-Scale)	1

*Can substitute a Pneumatic Sand Squeezer (42117) or a Digital Pneumatic Sand Squeezer (42160) instead of the Sand Rammer (42100), Sand Rammer Base (42100C) and Sand Rammer Pedestal (42100D).

Additions for Core Testing Laboratory – Level 2

Additions for Shell Testing on Page 52

Qty.	Model No.	Description	Level
1	42104C	Cold Tensile Strength Accessory	1
		or	
1	42104K	Transverse Strength Accessory	1

Recommended Calibration Accessories – Level 2

Qty.	Model No.	Description	Level
1	42125	Mechanical Load Cell	1
1	42132	Permeability Standard	1

Simpson Green Sand Testing Laboratory – Level 3

Qty.	Model No.	Description	Level
1	*42100	Sand Rammer	1
1	42100A	Tube Filler Accessory	1
1	*42100C	Sand Rammer Base	1
1	*42100D	Sand Rammer Pedestal	1
1	42104	Electronic Universal Sand Strength Machine	1
1	42104D	Splitting Strength Accessory	3
1	42104E	Green Deformation Accessory	2
1	42105	Digital Absolute Permmeter	1
1	42105C	Base Permeability Accessory	2
1	42106	Laboratory Sifter	2
1	42106A	Sieves	2
1	42106B	1/8" Microsplitter	2
1	42106D	1/2" Riffle Splitter	2
1	42108	Methylene Blue Clay Tester	1
1	42108B	Ultrasonic Cleaner	1
1	42112	Wet Tensile Tester	3
1	42118	Digital Balance	1
1	42119	Rapid Sand Washer	1
1	42127	Muffle Furnace	1
1	42129	Drying Oven	1
1	42130	Moisture Analyzer	1
1	42131	AFS Clay Tester	1
1	42137	Analytical Balance	3
1	42141	Friability Tester	3
1	42142	Electronic Mold Hardness Tester	1

*Can substitute a Pneumatic Sand Squeezer (42117) or a Digital Pneumatic Sand Squeezer (42160) instead of the Sand Rammer (42100), Sand Rammer Base (42100C) and Sand Rammer Pedestal (42100D).

Additions for Core Testing Laboratory – Level 3

Additions for Shell Testing on Page 53

Qty.	Model No.	Description	Level
1	42104C	Cold Tensile Strength Accessory	1
		or	
1	42104K	Transverse Strength Accessory	1
1	42145	Scratch Hardness Tester	3

Recommended Calibration Accessories – Level 3

Qty.	Model No.	Description	Level
1	42113	Calibration Kit	3

Simpson Green Sand Testing Laboratory – Level 4

Qty.	Model No.	Description	Level
1	*42100	Sand Rammer	1
1	42100A	Tube Filler Accessory	1
1	*42100C	Sand Rammer Base	1
1	*42100D	Sand Rammer Pedestal	1
1	42100E	Rowell Flowability Accessory	4
1	42104	Electronic Universal Sand Strength Machine	1
1	42104D	Splitting Strength Accessory	3
1	42104E	Green Deformation Accessory	2
1	42105	Digital Absolute Permmeter	1
1	42105C	Base Permeability Accessory	2
1	42106	Laboratory Sifter	2
1	42106A	Sieves	2
1	42106B	1/8" Microsplitter	2
1	42106D	1/2" Riffle Splitter	2
1	42108	Methylene Blue Clay Tester	1
1	42108B	Ultrasonic Cleaner	1
1	42110	Laboratory Muller	4
1	42112	Wet Tensile Tester	3
1	42118	Digital Balance	1
1	42119	Rapid Sand Washer	1
1	42127	Muffle Furnace	1
1	42129	Drying Oven	1
1	42130	Moisture Analyzer	1
1	42131	AFS Clay Tester	1
1	42137	Analytical Balance	3
1	42141	Friability Tester	3
1	42142	Electronic Mold Hardness Tester (B-Scale)	1

*Can substitute a Pneumatic Sand Squeezer (42117) or a Digital Pneumatic Sand Squeezer (42160) instead of the Sand Rammer (42100), Sand Rammer Base (42100C) and Sand Rammer Pedestal (42100D).

Additions for Core Testing Laboratory and Calibration on next page...

Additions for Core Testing Laboratory – Level 4

Additions for Shell Testing on Page 53

Qty.	Model No.	Description	Level
1	42104C	Cold Tensile Strength Accessory	1
		or	
1	42104K	Transverse Strength Accessory	1
1	42105D	Additional Permeability Accessory	4
1	42111	Core Sand Mixer	4
1	42145	Scratch Hardness Tester	3

Recommended Calibration Accessories – Level 4

Qty.	Model No.	Description	Level
1	42113	Calibration Kit	3

Simpson Green Sand Testing Laboratory – Level 5

Qty.	Model No.	Description	Level
1	*42160	Digital Pneumatic Sand Squeezer	5
1	42100E	Rowell Flowability Accessory	4
1	42100A	Tube Filler Accessory	1
1	42104	Electronic Universal Sand Strength Machine	1
1	42104D	Splitting Strength Accessory	3
1	42104E	Green Deformation Accessory	2
1	42105	Digital Absolute Permmeter	1
1	42105C	Base Permeability Accessory	2
1	42106	Laboratory Sifter	2
1	42106A	Sieves	2
1	42106B	1/8" Microsplitter	2
1	42106D	1/2" Riffle Splitter	2
1	42108	Methylene Blue Clay Tester	1
1	42108B	Ultrasonic Cleaner	1
1	42110	Laboratory Muller	4
1	42112	Wet Tensile Tester	3
1	42115	High Temperature Compression Tester	5
1	42118	Digital Balance	1
1	42119	Rapid Sand Washer	1
1	42127	Muffle Furnace	1
1	42129	Drying Oven	1
1	42130	Moisture Analyzer	1
1	42131	AFS Clay Tester	1
1	42137	Analytical Balance	3
1	42141	Friability Tester	3
1	42142	Electronic Mold Hardness Tester (B-Scale)	1

*Can substitute a Pneumatic Sand Squeezer (42117) or a Sand Rammer (42100), Sand Rammer Base (42100C) and Sand Rammer Pedestal (42100D) instead of the Digital Pneumatic Sand Squeezer (42160).

Additions for Core Testing Laboratory and Calibration on next page...

Additions for Core Testing Laboratory – Level 5

Additions for Shell Testing below

Qty.	Model No.	Description	Level
1	42104C	Cold Tensile Strength Accessory	1
		or	
1	42104K	Transverse Strength Accessory	1
1	42111	Core Sand Mixer	4
1	42145	Scratch Hardness Tester	3

Recommended Calibration Accessories – Level 5

Qty.	Model No.	Description	Level
1	42113	Calibration Kit	3

Shell Sand Testing Laboratory

(To be used in conjunction with one of the previously mentioned Green Sand Laboratories: Level 1-5)

Qty.	Model No.	Description	Level
1	42104F	Hot Shell Tensile Strength Accessory	2
1	42104L	Shell Transverse Attachment	1
1	42104N	Cold Shell Tensile Strength Accessory	1
1	42105A	Shell Permeability Accessory	3
1	42114	Hot Distortion Tester	4
1	42152	Melt Point Tester	4

Simpson No-Bake (Air-Set) Laboratory – Level 1

Qty.	Model No.	Description	Level
1	42103*	Tensile Strength Core Box	1
		or	
1	42103A*	Transverse Core Box	1
1	42104	Universal Sand Strength Machine	1
1	42104C	Core Tensile Strength Accessory	1
		or	
1	42104K	Core Transverse Testing Accessory	1
1	42118	Digital Balance (Suggestion: 0042118-04)	1
1	42127	Muffle Furnace	1

Recommended Calibration Accessories – Level 1

Qty.	Model No.	Description	Level
1	42125	Mechanical Load Cell	1

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