

Operating Instructions

AFS Clay Tester

Model 42131



Type:

AFS Clay Tester

Model:

42131

Part No.:

0042131-ASM

Serial Number:

Name and address of manufacturer:

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1 Introduction

Congratulations, you have just purchased an extremely reliable sand testing instrument that is backed by the professional technical support and years of proven sand technology experience of Simpson Technologies.

This laboratory equipment is constructed of quality materials and is the result of unsurpassed craftsmanship. The AFS Clay Tester should be operated only when it is in perfect condition, in accordance with its designed purpose and being aware of possible hazards. Observe the safety instructions in Section 2 and operating instructions in Section 5.

1.1 Application and Designated Use

The AFS Clay Tester (Model 42131) is used to determine the AFS and S+G clay content in clay bonded foundry molding sand by washing the clay and fine materials out of the sand. The sand weight can then be measured to calculate the weight differential before and after washing.

Any other application outside the intended usage will be regarded as use not in accordance with its purpose, and, therefore, the manufacturer / supplier will not be held liable for any damage that might arise thereunder. The risk in this case will be exclusively that of the User.

1 Introduction

1.2 Organizational Measures

The operating instructions should be readily available at the place of operation. In addition to the operating instructions, the general legal regulations or other mandatory rules for prevention of accidents and environmental protection should be made known and be observed!

The personnel instructed to use this apparatus, before beginning work, should have studied and fully understood these Operating Instructions, in particular the "Safety" chapter.

No modifications, extensions or changes of design of the device that would impact safety requirements should be put into effect without prior consent of the supplier! Spare parts must conform to the technical specifications defined by the manufacturer. This is always guaranteed when using original spares.

2 Safety

NOTICE

Before operating and/or performing maintenance or repair on Simpson Technologies designed and/or manufactured equipment, it is required that all personnel have read and understood the entire Operation Maintenance manual. If any questions exist, you must contact your supervisor or Simpson Technologies before taking further action.

If properly operated and maintained, your Simpson Technologies supplied equipment can provide many years of dependable and safe operation. Please follow all recommended safety, operating, and maintenance instructions. Furthermore, the introduction of any non-Simpson Technologies manufactured and/or approved parts to the equipment may create a hazardous situation. Never alter the equipment without prior consultation with Simpson Technologies .



DO NOT use this machine for purposes other than that for which it was intended. Improper use could result in death or serious injury.

2.1 Safety Signs and Labels

Simpson Technologies has incorporated the ANSI Z535.6 / ISO 3864-1-2 safety symbol only label format on all of its laboratory equipment.

The harmonized ANSI Z535.6 format became an established safety label format since it not only fully meets the current ANSI Z535 standards, but also incorporates ISO 3864-2 symbology and hazard severity panel and thus, can be used for both the U.S. and

2 Safety

2.1.1 Safety Alert Symbols



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. OBEY all safety messages that follow this symbol to avoid possible injury or death.



DANGER! Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



The safety alert symbol used without a signal word to call attention to safety messages indicates a potentially hazardous situation which, if not avoided, could or may result in death or minor to serious injury.

NOTICE

NOTICE indicates information used to address practices not related to personal injuries by may result in property damage.



This symbol indicates information containing important instructions concerning the use of the machine or directions for further procedures. Ignoring this information can lead to malfunction of the machine.

2.1.2 Safety Symbol Labels



ELECTRICAL SHOCK / ELECTROCUTION (STC #217958)

This label is located on the back near the power inlet cover.

With the top and / or rear covers removed, the electrical power supply and electrical terminals are exposed. A hazardous voltage is present, can cause electric **shock** or **burn**, and will result in serious injury. Follow **Lockout and Tagout** procedures before servicing.



READ AND UNDERSTAND ALL SERVICE MANUAL INSTRUCTIONS (STC #214042)

This label is located on the base front right corner.

Before operating and/or performing any maintenance or repair on Simpson Technologies designed and/or manufactured equipment, it is required that all personnel read and understand the entire Operating Instructions manual. All protective guards and covers shall be installed, and all doors closed before operating the equipment. If any questions exist, you must contact your Supervisor or Simpson Technologies before taking further action. Follow **Lockout and Tagout** procedures before servicing.

2.2 Lockout and Tagout System Procedure

NOTICE

*Whenever performing any type of maintenance or repair, whether in the form of cleaning, inspection, adjustment, mechanical or electrical maintenance, the equipment must be rendered into **Zero Mechanical State (ZMS)**.*

Prior to any maintenance (routine or otherwise) or repair of equipment, a safety procedure should be established and maintained. This procedure should include training of personnel; identification and labeling of all equipment which is interlocked mechanically, electrically, through hydraulics, pneumatics, levers, gravity or otherwise; and a listing of the established lockout procedures posted on each piece of equipment.

"Lockout and Tagout" refers to specific practices and procedures to safeguard personnel from the unexpected energizing of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance, and that the authorized employee(s) lock or tag the energy-isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively.

2.2.1 Lockout and Tagout Devices

When attached to an energy-isolating device, both lockout and tagout devices are tools used to help protect personnel from hazardous energy. The lockout device provides protection by holding the energy- isolating device in the safe position, thus preventing the machine or equipment from becoming energized. The tagout device does so by identifying the energy-isolating device as a source of potential danger; it indicates that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

2.2.2 Glossary:

Authorized Person(s) - Personnel who have been designated by his/ her department to perform maintenance or service on a piece(s) of equipment, machinery or system, and are qualified to perform the work through proper training on the Lockout/Tagout procedures for the equipment, machinery or system.

Lockout - The placement of a lockout device on an energy isolating device, in accordance with an established procedure, to ensure that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device - Any device that uses positive methods, such as a lock (either key or combination type), to hold an energy isolating device in a safe position, thereby preventing the energizing of machinery or equipment. When professionally installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.

Tagout - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device - Any prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure. The tag indicates that the machine or equipment to which it is attached is not to be operated until the tagout device is removed in accordance with the energy control procedure.

Zero Mechanical State - The mechanical potential energy of all portions of the equipment or machine is set so that the opening of pipes, tubes or hoses, and the actuation of any valve, lever or button, will not produce a movement which could cause injury.

3 Short Description & Specifications

3.1 Description

AFS clay is the percentage of particles with a diameter less than 20 microns (.02 mm) 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 42119).

The AFS Clay Tester (Model 42131) 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 (.02 mm) to settle. If this process is repeated enough, all particles smaller than 20 microns (.02 mm) will be removed.

The Clay Tester is formed by a vertical frame with a center support that holds a 1000 ml beaker. When the beaker is in position, the following elements are in its interior:

- A filling and draining tube, where water enters, and the overlaying liquid are siphoned out.
- A maximum level electrode that stops the fill water when the maximum liquid level has been reached.
- The minimum level electrode that stops the drainage of overlaying liquid when the minimum level has been reached. This electrode also incorporates a temperature sensor in its tip.

3 Short Description & Specifications

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. The temperature sensor 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.

3.2 Theory of Operation

According to Stokes' Law, the final falling velocity of a spherical particle in a fluid is:

$$v = \frac{g \cdot D_p^2 (\delta_p - \delta)}{18 \mu}$$

Where:

- v = Final falling velocity
- g = Gravity acceleration
- D_p = Diameter of particle
- δ_p = Specific gravity of particle
- δ_f = Specific gravity of fluid
- μ = Absolute viscosity of fluid

This law is valid when the Reynolds number

$$N_{Re} = \frac{D_p \times v \times \delta_l}{\mu}$$

is less than 0.3, as it is in μ the case with particles of 20 microns or less that settle in water.

Because this test is made at different temperatures, and both the absolute viscosity and the specific gravity of the fluid vary significantly, the settling speed of the particles will also change, increasing as the temperature increases.

The Clay Tester can automatically adjust settling times to compensate for temperature changes. A thermistor registers the temperature of the liquid at the end of the settling period. This data is received by a micro-processor that corrects the settling time for the next process.

Stokes' Law shows that the specific gravity of the particles also influences the rate of settling.

Silica sand with a specific gravity of 2.65 is the most commonly used foundry aggregate. Under certain circumstances, or for sound technical reasons, some foundries have chosen olivine (s.g. = 3.3), chromite (s.g. = 4.6), and zirconia (s.g. = 4.6) for molding operations.

If these wide differences in specific gravity, relative to silica, were not taken into account, a significant fraction of material up to 20 microns would settle together with larger material.

The Clay Tester has an operation program that will take into account these differences. The operator can load information on the type of sand that is to be tested and the microprocessor automatically makes the necessary adjustments in the settling time.

3 Short Description & Specifications

3.3 Specifications, Dimensions and Weights (Approximate)

Specifications	AFS Clay Tester (Model 42131)
Length	584 mm (23 in.)
Width	343 mm (13.5 in.)
Height	279 mm (11 in.)
Weight	11.4 kg (25 lbs.)
Power	115/230V; 50-60Hz
Water Pressure	Minimum incoming pressure 1.7-2 bar (25-30 PSI)

4 Unpacking and Installation

4.1 Unpacking

NOTICE

Your new Laboratory Equipment has been thoroughly inspected before being shipped to your plant. However, damage can occur enroute, so it is wise to inspect all equipment on arrival. Notify both the carrier and Simpson Technologies of any damage at once. Damage should be noted on the shipper's receipt before signing for receipt of the shipment.

The AFS Clay Tester, Model 42131, is shipped in one piece and is intended to be used as received; no further assembly/disassembly is required. The approximate instrument dimensions are 584mm (23 in.) Height x 343mm (13.5 in.) Wide x 279mm (11 in.) Long and its weight 11.4 Kg. (25 lb.).



ONLY authorized personnel may unload and install this equipment. Two people may be required to unpack this instrument due to the bulky dimensions and tight-fitting packing crate.

1. Carefully remove apparatus from the packing crate and place it on stable bench.
2. Once removed from the crate, proceed by taking off any protective wrap and unpackage the included accessories.
3. The packaging remains the property of the Customer and may be used for returning the apparatus if some repair is required.

4 Unpacking and Installation

4.2 Components

Your AFS Clay Tester is shipped with the following accessories and installation components. Please take a moment and identify that the following items were included:

- AFS Clay Tester
- Flow control needle valve
- Fill hose; ½" PVC x 3 feet long
- Drain hose; ½" PVC x 3 feet long
- One hose barb
- Two stainless steel hose clamps
- Power Cord
- 1000 ml Beaker

NOTICE

Do not store the device in the open and unprotected from atmospheric conditions. If this instruction is not followed, claims under guarantee will no longer be considered.

4.3 Installation

The installation of the apparatus is the responsibility of the Client to include procuring and preparing the material required for this purpose.

In order to guarantee effective performance, a solid surface that is free of vibration is recommended.

Place the apparatus on a stable bench. Although it is not required that the machine be perfectly level in order to operate, it should be in a level condition. The machine can be leveled by making adjustments to the four adjustable rubber feet located at each bottom corner of the tester.

The AFS Clay Tester is intended for operation by one operator. It is recommended for use in a foundry sand laboratory, with its operation display and programming buttons placed at a level for easy use and observation by the operator.

4.4 Electrical Power Connection

Electrical Requirements: 100 – 240 Volts, 50-60 Hz + Ground (5Ω or less).



Connect the equipment to grounded electrical outlet.




Before connecting equipment, verify that the voltage marked on the serial number plate is the same as the electrical outlet to be used for the machine. Outlet must be properly grounded! Failure to follow safety procedures could result in serious injury.

Water Requirements: 1.7 - 2 bar (25-30 PSI) minimum and 3 bar (44 PSI) maximum supply pressure.


In order to guarantee effective performance, place the AFS Clay Tester on a bench near a water supply and drain. The drain must be


4 Unpacking and Installation

 at least 10" (254 mm) below the tester to insure proper water discharge.


4.5 Connecting Power

1. Connect the water inlet (Figure 2, Item 11) of the unit to the supplied flow control needle valve with supplied reinforced hose and connectors (see Figure 3).
2. Connect the needle valve to the main water feed point (supplied by the customer). The needle valve is standard 3/8" pipe. The main water feed must have a shut off valve.

 It is recommended that filter screen unit be installed just after shutoff valve before the supplied flow control needle valve to eliminate any rust, scale or sediment that could get into the filling solenoid orifice of the AFS Clay Tester.

 It is **EXTREMELY** important that the water supply have a minimum pressure of 25 PSI and a maximum of no more than 44 PSI.

3. Connect the water outlet (figure 2, Item 10) of the unit to the drain with the supplied plastic hose. Before installing the hose make certain that there are no obstructions in the tester or drain.
4. Verify the voltage on the specification plate located on the back of the AFS Clay Tester. Connect the power cable supplied with the tester into the power plug receptacle (Figure 2, Item 8) located on the back of the tester.

 Some areas may require an electrical plug that is not supplied with the power cord to properly conform to the specific electrical outlet. These special electrical plugs will need to be purchased separately by the customer.

5. Verify the proper voltage of the electrical outlet before plugging the power cord into the outlet. Connect power cord to an AC electrical outlet that is free of disturbances/fluctuation and is properly grounded.

NOTICE

It is highly recommended that a voltage stabilizer/filter (line conditioner) is installed between the electrical outlet and the inlet of the AFS Clay Tester. This device will help to ensure the proper performance of the AFS Clay Tester.

4.6 Adjust the Water Flow

1. Adjust the water flow to the unit in the following manner:
 - » Open the main water valve.
 - » Weigh a 50-gram sample of sand into the 1000 ml beaker and start the washing cycle as explained in the next section.
 - » Carefully open the needle valve until the water flow stirs all the sand grains but does not spiral or splash out of the beaker. This procedure will be easier if white silica (unbonded) sand is used instead of clay bonded sand as it is easier to see the movement in the beaker.
2. This flow adjustment must be changed when testing sands with a different specific gravity.
3. The equipment is ready to operate.

4.7 Airborne Noise Emission

Regarding airborne noise emission by the AFS Clay Tester (Model 42131), there is no motor or other noise emitted by this machinery other than the noise from water being poured into a glass beaker (approx.1 liter) with normal pressure (≤ 6 bar) when the beaker is being filled. As such, the equivalent continuous A-weighted sound pressure level at the workstation does not exceed 70db(A).

5 Operating Instructions



For more information on how to use and care for your Simpson Analytics equipment and accessories visit our Simpson Technologies channel on YouTube and search our library of videos. Subscribe to our channel to keep updated on new releases.

5.1 Preparing the Sand Sample

1. Take a representative sample of the sand to be tested and reduce it to approximately 100 grams
2. Dry this sample in an oven at 105°C (220°F) for one hour or to a constant weight. Make certain that the sand is spread on a thin layer to facilitate water evaporation.
3. After a constant weight is reached, cool the sample in a desiccator to room temperature.
4. From the cooled sample, weigh out approximately 50 grams.
5. Transfer the 50-gram sample to the 1000 ml beaker. Be careful not to lose any material. Add 450 ml of tap water (or better, distilled water) at room temperature and 50 ml of 2% sodium pyrophosphate solution ($\text{Na}_4\text{P}_2\text{O}_7 \cdot 10\text{H}_2\text{O}$).
6. Place the prepared beaker in the Rapid Sand Washer (Model 42119) and place the electric agitator disc into the beaker. Stir the sand sample in the beaker for five minutes.
7. Carefully lift the agitator out of the beaker and return any particles adhered to the agitator back into the beaker with the help of a wash bottle.

5.2 Programming the Clay Tester

1. Turn on the power switch (Figure 2, Item 7) located on the back of the tester and open the main water line valve. The needle valve has been previously regulated in step 5 of Section 5.3 and must not be touched unless calibrating it for another type of sand.
2. The display on the controller will show a five second message followed by the message **READY TO START** in the upper line, and **CYCLE: 0** in the lower line. The upper line is called the Status Line hereafter, and the lower line is called the Parameters Line. The purpose of the Status Line is to make available at any time the operating status of the tester.

3. The possible messages in the Status Line are:

READY TO START	Stand-By
PROGRAMMING	The menu mode is in progress
SYSTEM ERROR	An error has occurred
WASHING: FILLING	Beaker filling sequence step
WASHING: SETTLING	Sand settling sequence step
WASHING: EMPTYING	Beaker emptying sequence step

4. The Parameters Line is subdivided into three fields as follows:
 - » The left field parameter: **Identification** displays the name of the parameter selected.
 - » The central field parameter: **Value** displays the value of the parameter selected. It may be a numeric value (i.e., cycles) or an element of a list (i.e., the sand selected).
 - » The right field parameter: **Units** displays the units of a parameter selected.

5 Operating Instructions

5. The functions that can be displayed in the Parameters Line are as follows:

	<i>ID</i>	<i>Value</i>	<i>Units</i>
Selected Mode	MODE:	xxx	
Selected Sand:	SAND:	xxxxx	
Cycles Preset	PRESET :	xxxx	CYC
Current Cycle	CYCLE :	xxxx	
Cycles to End	TO END:	xxxx	CYC Current
Cycle Settling Time:	SETTLING:	xx.xx	MIN Water
Temperature	W. TEMP:	xx	°C

6. You can select any one parameter to be displayed at any time, even in the middle of a washing cycle, using the **ENTER** key.



The **ENTER** key is a double function key that validates the current value of the parameter in the **PROGRAMMING** mode and rolls the Parameters Line while the menu mode is not active.

7. When the Status Line shows the **READY TO START** message, press the **MENU** key and the Status Line will change to **PROGRAMMING** and the Parameters Line will show the message:

MODE: aaa

Where aaa may be AFS or S/G. The mode refers to the AFS (American Foundry Society) or the S/G (Simpson/Gerosa) mode of operation. To select the operation mode, press the keys **UP** or **DWN** until the AFS or S/G messages appear. Press the **ENTER** key to set the desired mode.

8. Now the screen will show:

PROGRAMMING

SAND: aaaaa

9. With the **UP** or **DWN** keys the different options will appear consecutively:

SILICA

OLIVINE

ZIRCONIA

CHROMITE

When the desired option appears, press the **ENTER** key.



In the AFS mode, the type of sand is only used as a reference; there is no program variation. If the Simpson/Gerosa mode is elected, however, the settling times vary as a function of the type of sands and water temperature.

10. Now the display will show:

PROGRAMMING

PRESET: 9999 CYC

5 Operating Instructions

11. With the UP, DWN and START/STOP keys, select the number of cycles (including the two 10 minute cycles, which are constant) that your experience determines as necessary for an optimum washing. If you have no previous experience with an AFS clay tester, then cycle the machine until the water/sand solution between the maximum and minimum level electrodes appears clear at a point just before the unit begins siphoning. To set the desired number of cycles, use the following key combinations:

UP +1 cycle

DWN -1 cycle

START/STOP +10 cycle

START/STOP + UP +100 cycle

START/STOP + DWN -100 cycle

In the last two options first press the **START/STOP** key, and keep it pressed while pressing **UP** or **DOWN**.

12. Once the desired number of cycles is displayed, press **ENTER**.
With this last operation the programming is finished.

5.3 Clay Washing

1. Once programmed, each parameter can be checked by pressing the **ENTER** key. The display will scroll through all the set parameters consecutively. If any parameters are wrong or not desired, they can be corrected by repeating the programming sequence again.
2. Place the beaker containing the prepared sand sample and liquid into position in the Clay Tester. See 1000 ml beaker (Item 4) position in Figure 1.

3. To begin clay washing, press the **START/STOP** key. Water will begin flowing into the 1000 ml beaker. Check that the rate of stirring is correct and that there is no splashing. If necessary, regulate the flow with the needle valve.

NOTICE

If the water pressure is not high enough to obtain the degree of stirring needed for a proper washing, the controller will show the message:

SYSTEM ERROR

LOW WATER PRESS

*and abort the cycle in progress. Simply press the **MENU/CLEAR** key to return to **READY TO START** status.*

4. When the liquid reaches its maximum level, the water flow stops, and the first ten-minute settling cycle begins. The LCD screen shows the count down time until the cycle is finished.
5. At this point, the drainage stage starts until the liquid reaches its minimum level.
6. The filling, ten-minute settling, and draining cycle starts again automatically. When the second ten-minute cycle is finished, a five-minute settling cycle (if the AFS mode is selected) or the temperature/type of sand related cycle time (if the S/G mode is selected) will follow. These are repeated until the number of preset cycles are completed. This condition is indicated by the following message on the display:

READY TO START

PRESET IS REACHED

7. The operator must press the **MENU/CLEAR** key to erase the **PRESET IS REACHED** message.

5 Operating Instructions

8. During the washing cycles the LCD screen shows:

Status Line: Current Washing Sequence

Parameter Line: The parameter selected using the **ENTER** (roll) key

NOTICE

If the beaker is removed in the middle of the washing cycle (at any step) the controller will abort the cycle in progress and show the message:

SYSTEM ERROR

MISSING BEAKER

To clear this error message, press the **MENU/CLEAR** key to return to **READY TO START** status.

9. If the **START/STOP** key is pressed in the middle of a washing cycle, the controller will move to the beaker emptying step, remain there until all the water is drained out of the beaker and return automatically to **READY TO START** status.

5.4 Determining AFS Clay Percentage

When washing cycles are complete, remove the beaker from the Clay Tester and place it into a drying oven. Dry sample at a temperature of 212°F (100°C) until all water has evaporated or sample has achieved constant weight.

$$\text{AFS Clay \%} = \frac{(\text{Starting Sample Weight}) - (\text{Weight of Washed and Dried Sample})}{\text{Starting Sample Weight}} \times 100$$

6 Maintenance



For more information on how to use and care for your Simpson Analytics equipment and accessories visit our Simpson Technologies channel on YouTube and search our library of videos. Subscribe to our channel to keep updated on new releases.



*Before performing any maintenance, turn off main water supply and remove the electrical power cord from the wall receptacle. The AFS Clay Washer must be put into **Zero Mechanical State (ZMS)**. Follow **Lockout and Tagout** procedures before servicing.*

6.1 General Maintenance

1. Keep the high- and low-level probes clean by gently wiping the probes to remove any buildup.
2. Inspect and clean the discharge water filter located on the back of the AFS Clay Tester (Figure 2, Item 9); for detailed instructions see paragraph 6.2 of this section.
3. Maintain and clean the drain hose. Remove and clean any adhering sand/clay from the drain hose by flushing it with clean water.

6.2 Instructions for Cleaning Filter

1. Turn off power switch (Figure 2, Item 7).
2. Pull out power cord from receptacle on back of machine (Figure 2, Item 8).
3. Turn machine so back is facing you (see Figure 2). You may have to remove water inlet hose (Item 11) and drain hose (Item 12).

4. Remove the four screws securing the cap (Figure 2, Item 9) and then, if necessary, pry the cap out.



There is a spring inside the filter chamber. Use caution when removing the four screws holding the cap.

5. Remove spring and filter screen. You may have to tilt the machine backwards so the filter will slide out.
6. Clean filter by flushing with water. Blowing out with air may also help dislodge sediment from screen.
7. Replace filter screen into chamber exactly as it was removed. The flange or open end must go inside chamber first.
8. Replace spring.
9. Put some liquid soap on the "O" ring on cap. This will make replacement easier. Push cap against spring, push cap onto chamber and seating the "O" ring. Hold cap in place and start one of the screws. This will keep cap in place. Replace the other three screws and tighten. Screws do not require hard tightening, just snug up. The "O" ring seals cap to chamber.
10. Replace water inlet hose to inlet (Figure 2, Item 11) and drain hose to outlet (Figure 2, Item 12) if they were removed. Be sure to tighten the hose clamp on the inlet hose securely.
11. Replace power cord into receptacle (Figure 2, Item 8).
12. Turn on power switch (Figure 2, Item 7) and reprogram machine to desired parameters.

7 Apparatus Layout

7.1 AFS Clay Tester



Figure 1: Front View

Item#	Description
1	Digital Display
2	Programming Buttons
3	High Level Probe
4	1000ml Beaker
5	Filling/Draining Probe
6	Low Level Probe

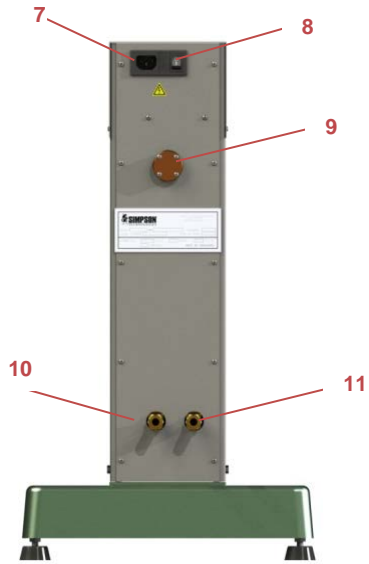


Figure 2: Back View



Figure 2: Close-up Detail

Programming Button	Icon
MENU/CLEAR	
UP	
DOWN	
ENTER	
START/STOP	

Item#	Description
7	Power Switch
8	Power Cord Receptacle
9	Filter
10	Water Outlet
11	Water Inlet

7.2 Water Flow Control Valve

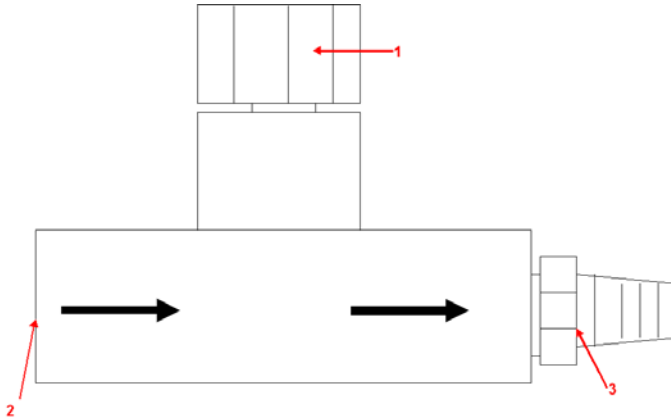


Figure 3

Item#	Description
1	Water Flow Adjustment Knob
2	Water Inlet (3/8" Pipe)
3	Water Outlet with Hose Barb

8 Spare Parts / Ordering Parts / Returns

8.1 Spare Parts List

Simpson maintains a large inventory of common spare parts for all current Simpson Analytics products. The following table provides part numbers for common spare parts for this device. Contact Simpson Technologies with the part number and description when ordering.

Part No.	Description
0045843	Strainer Screen Assembly
0045842	AFS Clay Tester O-ring Set
0045844	Retainer Spring
0045818	1000 ml Beaker

8.2 Ordering Replacement / Spare Parts

The source of replacement parts for your Simpson Analytics equipment is just as important as the make of the equipment you purchase. ALWAYS order parts for your Simpson Analytics equipment directly from Simpson Technologies. To find the Simpson office closest to you please visit us on the internet at simpsongroup.com on the “Contact Us” page.

Parts may be ordered from the sales department via e-mail at parts@simpsongroup.com: When contacting our sales department to obtain a quotation on replacement parts or service please always include the equipment serial number, the description of the part and the part number. Your Simpson Technologies sales team representative will provide you with a quote on the items with current price and delivery times. When ordering, please always refer to the quote number on your order.

To arrange for calibration support or repair assistance please contact our customer service department at service@simpsongroup.com.

8.3 Returned Goods Policy

Simpson Technologies strives to provide their customers with maximum follow-up support and, in order to offer the most practical flexibility, the following conditions apply to returned goods. Adherence to these procedures will assure the most prompt and efficient service.

RETURNS WILL BE CONSIDERED IN THE FOLLOWING SITUATIONS:

- Products ordered in error by customer (subject to a restocking charge).
- Incorrect or defective products shipped to customer.
- The return of existing products for factory repair or upgrade.
- Products ordered correctly but which are unwanted or unsuitable (subject to a restocking charge).
- A Safety Data Sheet (SDS) must accompany material that is sent to Simpson Technologies for testing purposes. Simpson Technologies will NOT authorize the return of hazardous materials.

RETURN PROCEDURE:

- **The customer must obtain a Return Material Authorization Number (RMA#) from Simpson Technologies prior to returning the goods.**
- To obtain an RMA#, the customer should contact the Customer Service department by phone, fax, e-mail to service@simpsongroup.com. The material being returned must be identified and the reason for its return clearly specified. Once approved for return, Simpson Technologies will issue the customer an RMA form to be included with the shipment and with instructions on where and how to ship the goods.
- All returned goods are to be shipped with transportation charges PREPAID, unless otherwise agreed when the RMA# is assigned. If it has been predetermined that return goods are to be shipped COLLECT, Simpson Technologies will specify the desired routing.
- All returned shipments will be subject to inspection upon arrival at Simpson Technologies.
- Material returned without an RMA# may be refused and returned at customer's expense.

9 Decommissioning



Before doing any work, review the Safety Procedures in Section 2 and Lockout/Tagout all the power sources to the machine and peripheral equipment. Failure to follow safety procedures could result in serious injury.

Use qualified personnel and follow safety procedures, applicable local policies and regulations in decommissioning the AFS Clay Tester and peripheral equipment.

Electrical Power: Disconnect the electrical power source and verify there is no power on all components being decommissioned.

Water Supply: Shut off the water supply to the Tester before dismantling.

WASTE DISPOSAL

The Machinery and Controls consists of

- Iron
- Aluminum
- Copper
- Plastic
- Electronic Components and Circuit Boards

Dispose of the parts in accordance with the applicable regulations.



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