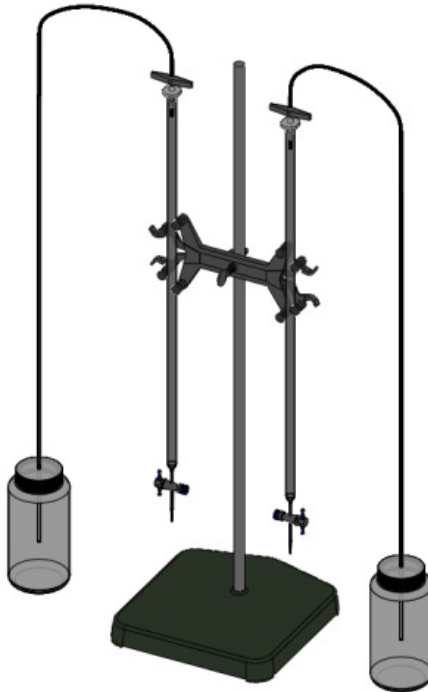


Operating Instructions

Acid Demand Value Test Kit

Model 42136



Type:

ADV Tester

Model:

42136

Part No.:

0042136-ASM
0042136-220-ASM

Serial Number:

Name and address of manufacturer:

Simpson Technologies
2135 City Gate Lane Suite 500
Naperville, IL 60563

For other Simpson Technologies offices around the world and for our contact information please visit us on the internet at simpsongroup.com

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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 Acid Demand Value (ADV) Test Kit 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.

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 binders' system is acid catalyzed and the acid in this chemical binder is very mild, the present of basic material can neutralize this weak acid retarding the curing reaction. The ADV of the sand should be monitored because drastic changes can require a catalysts modification.

1.1 Application and Designated Use

The ADV Test Kit, Model 42136, is intended exclusively for preparing test samples consisting of foundry sand. Usage of other materials may be possible upon consultation with the Technical Service department of Simpson Technologies.

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 Operating Instructions 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 serious injury.

2 Safety

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 symbols into the hazard severity panels and, thus, can be used for both the U.S. and international markets.

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.



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 indicates information used to address practices not related to personal injuries but 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



Wear Safety Goggles (STC #214075)

This label is located on the base of the Burette Holding Clamp Arrangement.

When conducting tests with any type of chemicals, liquid or solid, they can spill, splash and air born into the surrounding area, and it may get into the eyes and may irritate or damage the eye. *Follow Safety Procedures when handling chemicals.*



Wear Protective Gloves (STC 217975)

This label is located on the base of the Burette Holding Clamp Arrangement.

When conducting tests with any type of chemicals, liquid or solid, they can spill, splash and air born into the surrounding area and may produce burns on unprotected skin. *Follow Safety Procedures when handling chemicals.*



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

This label is located on the base of the Burette Holding Clamp Arrangement.

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. If any questions exist, you must contact your Supervisor or Simpson Technologies before taking further action. Follow Safety System Procedures before servicing.

2.2 Safety System Procedure

NOTICE *Whenever performing any type of maintenance or repair, whether in the form of cleaning, inspection, adjustment or mechanical 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 labelling of all equipment which is interlocked mechanically, through levers, gravity or otherwise; and a listing of the established procedures posted on each equipment.

2.2.1 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 Safety System Procedures for the equipment, machinery or system.

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 Short Description & Specifications

3.1 Application

The Acid Demand Value (ADV) in foundry sand control is recommended particularly in the hot box process since many of the activator systems are only mildly acidic, the effects of the presence of alkaline or basic accumulations on the sand grains can be highly detrimental and prevent the attainment of uniformity of the various sand mixtures from batch to batch. The presence of alkaline substances in base sands makes it mandatory that a guide be adopted as a means of measuring the influence of these alkaline reacting materials so that greater uniformity and formulation control may be achieved. The acid demand value and assigned number has been determined not as a direct value, but as an indicator. The acid demand number is usually expressed as the number of milliequivalents (meq) of 0.1N HCl used or reacted with the diluents which may be present in a 50-gram sample of the sand being tested.

3.2 Description

The ADV Test Kit consists of a Burette Holder Assembly (Figure 1), a pH/mV/Temperature Meter with the Universal Electrode Holder (Figure 2) and a Magnetic Stirrer with Spin Wedge Stir Bar (Figure 3).



Figure 1



Figure 2



Figure 3

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 ADV Test Kit, Model 42136, is shipped in one container. No lifting equipment is required for handling

Remove the parts from the shipping container and place them in a location away from any packaging material to assure that these items are not misplaced.

1. Carefully remove the ADV Test Kit from the packing container and place the accessories on a bench.
2. Once removed from the container, proceed by taking off any protective wrap and unpackage the protective material from the included accessories.

4 Unpacking and Installation

4.2 Components

Your new ADV Test Kit is shipped with the following accessories and installation components. Please take a moment to identify that the following items were included:

- Unit pH/mV/Temperature Meter and Manual (Figure 2)
- Universal Electrode Holder and Manual (Figure 2)
- Magnetic Stirrer and Manual (Figure 3)
- Spin Wedge Stir Bar
- Glass Beaker, 250mL
- Base with Vertical Rod (Figure 4)
- Burette Holder Clamp (Figure 5)
- Burette – 50mL (2) (Figure 6)
- Zeroing Burette Kit (2)



If any of the above components or literature is missing, call your local Simpson Technologies office.

NOTICE

Do not store the electronic devices 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, the DVD Test Kit components should be situated close to each other for ease of operation.

The ADV Test Kit would likely be occupied by one operator at a time. It is used in a foundry sand laboratory and the instruments digital control screens and measurement scales placed at eye level for the operator. It should also be placed in an ergonomically correct position so that the operator can easily handle the test operations.

Consult the pH/mV/Temperature Meter, Universal Electrode holder and the Magnetic Stirrer instruction & operating manuals for their set-up and operation.

4.4 Set-up of the Burette Holder Assembly (Figure 1)



Figure 4



Figure 5



Figure 6

Components included:

- Base (Figure 4)
- Vertical Rod (Figure 4)
- Burette Holding Clamp (Figure 5)
- Two 50mL Burettes (Figure 6)
- Two Zeroing Burette Kit

1. Identify the above-listed items.
2. Attach the Vertical Rod to the Base (Figure 4) by screwing the threaded end of the rod into the threaded hole at the base.
3. Burette Holder Clamp (Figure 5), unscrew the threaded knob that is in the middle of the Holder Clamp to be available to clamp it to the Vertical Rod, then by untighten and tighten the threaded knob you will be available to slide it up and down to position it (approx. 565mm(22.25”) from the base).

4. Mounting the 50mL Burettes (Figure 6) into the Burette Holder Clamp (Figure 5). Compress the spring load clamps to allow the placing and positioning of each Burette. Acid will be placed on the left and base on the right. Avoid obstructing the graduation markings on the Burettes and keep them facing forward.
5. To slide the Burettes up and down, holding the Burette with one hand and with the other compress the spring load clamps and then slide the Burette up or down to allow for adequate room above the 250mL beaker. Keep the distance close to the beaker to avoid any splash while filling.
6. While the Burette Holder Clamp (Figure 5) and Burettes (Figure 6) are aligned; tighten the threaded knob on the Vertical Rod.
7. Install the Self-zeroing Burette Kit per they include instructions in the Kit.



After filling the self-zeroing burette kit bottles with the proper chemical, mark each bottle identifying the chemical contained in the bottle. Follow Safety Procedures when handling chemicals.

4.5 Airborne Noise Emission

Regarding airborne noise emission by the ADV Test Kit, Model 42136, there is no motor or other noise emitted by this machinery other than the low stirring agitation noise from the Spin Wedge Stir Bar. Therefore, the equivalent continuous A-weighted sound pressure level at the workstation does not exceed 70db (A).

5 Operating Instructions

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.

1. Obtain representative sample of sand to be tested.
2. Pipette 50mL of distilled or deionized water into 250mL beaker and place the Spin Wed Stir Bar gently into the 250mL beaker.
3. Add sample of sand into the 250mL beaker, assuring no to splash out any water.
4. Place the 250mL beaker on the Magnetic Stirrer and begin to agitate the sand assuring no to splash out any of the material from the beaker.
5. Pipette 50mL of 0.1N HCl into the beaker and continue the stirring action for 5 minutes.

6. At the end of the stirring period, place the electrode of the pH meter into the slurry and continue the stirring action while the acid is back titrated with 0.1N NaOH to a pH of 7. Record the amount of 0.1N NaOH required reaching pH 7.
7. A blank (50mL H₂O and 50mL 0.1N HCl but no sand sample) should be rung along with each set of tests for the purpose of correcting the back-titration. Record mL of NaOH required to back-titrate the 50mL of HCl in Blank.



NOTE: For accuracy and reproducibility, total back titration time should not exceed three (3) minutes.

8. Calculate the ADV (Acid Demand Value) as follows:
 - a. $[50\text{mL HCl} - (\text{Blank Adj.})] - \text{mL of NaOH required to reach pH 7} = \text{Acid Demand Value (ADV)}$
 - b. $\text{Blank Adjustment} = 50\text{mL HCl in blank} - \text{mL NaOH required to reach pH 7 in blank (retain algebraic sign of blank adjustment)}$.

6 Maintenance and Calibration



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.

6.1 Maintenance

Consult the pH/mV/Temperature Meter, Universal Electrode holder and the Magnetic Stirrer instruction & operating manuals for their maintenance recommendations.

Keep all the ADV Test Kit components from accumulating dust and wash the glass beaker periodically.

6.2 Calibration

- Follow manufacturer's procedure for calibration of equipment.
- Solutions are calibrated by using blank as described in test procedure.
- Deionized and distilled water, being void of free hydrogen ions, can give erroneous pH readings. Overcome this problem by using an appropriate pure water test kit available on the market.

7 Parts List / Ordering Parts / Returns

7 Parts List / Ordering Parts / Returns

7.1 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.

Parts List

Description	Qty.	Figure No.	Part No.
Unit pH/mV/Temperature meter	1	1	0042136-IP
Universal Electrode Holder	1	1	0036-505
Magnetic Stirrer	1	3	0042136-IS
Base with Vertical Rod	1	4	0025-100
Burette Holder Clamp	1	5	214700
Burette – 50mL	2	6	0036-503
Zeroing Burette Kit	2	-	0036-504
Spin Wedge Stir Bar	1	-	0036-502
Glass Beaker, 250mL	1	-	0036-501

7.2 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.

7.3 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 Material Safety Data Sheet (MSDS) 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.

8 Decommissioning

8 Decommissioning



Before doing any work, review the Safety Procedures in Section 2. 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 ADV Test Kit and peripheral equipment.

WASTE DISPOSAL

The machinery and controls consists of:

- Iron
- Aluminum
- Copper
- Plastic

Dispose of the parts in accordance with the applicable regulations.

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