SIMPSON
A Norican Technology

Operating Instructions

Electronic Mold Hardness Tester

Model 42142

Model 42143

Type:	Electronic Mold Hardness Tester
Model No.:	42142 42143
Part No.:	0042142 0042142ADV 0042143 0042143ADV
Serial No.:	

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 Electronic Mold Hardness Tester (Model 42142-42143) 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 Electronic Mold Hardness Tester (Model 42142-42143) is intended exclusively for measuring the hardness of the core or mold present in foundry molding sands. Usage of other materials may be possible upon consultation with the Service department of Simpson Technologies (service@simpsongroup.com).

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.

1.2 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, particularly 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 *The following Safety Instructions must be studied by the responsible personnel before commissioning and adhered to when operating the machine.*

2.1 Safety Alert Symbols

This Manual does not imply any guarantee, but just has the intention of conveying technical information. We reserve the right to modify the contents of these Operating Instructions.

To facilitate quick comprehension and secure handling the symbols used in the publication are shown below.

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 injury or death.

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

NOTICE *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.

Use only the battery specified for the tester.

Always safely dispose of the battery according to local regulations.

Never expose battery to direct heat or dispose of it by incineration!

Improperly using the battery can cause it to leak and damage nearby items and may cause the risk of fire or personal injury.

We reserve the right to all modifications which do not affect the technical content of these Operating Instructions.

3 Short Description & Specifications

3.1 Description

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 by 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.

3.2 Software Functions

1. Basic Part No (0042142/0042143):
   - » Store and display date of last calibration
   - » Store and display username
   - » Basic point to point mode
2. Advanced Part No. (0042142ADV/0042143ADV):
   - » Store and display date of last calibration
   - » Store and display username
   - » Basic point to point mode
   - » Auto average mode
   - » Scan mode
   - » Store up to 900 data points
   - » Identify up to 32 molds.
   - » Digital calibration of displacement
   - » Infrared data transfer to computer

3.3 Modes of Operation

1. Basic Model

   » 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.

2. Advanced Model

   » Point to Point Mode - The Advanced Electronic Mold Hardness Tester 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 - This feature is only available on the Advanced Electronic Mold Hardness Testers. It allows the operator to measure mold hardness at several separate locations on the mold surface. The instrument will automatically display the number of test points and average mold hardness for that group of data. 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.

3.4 Specifications

Requirements	Electronic Mold Hardness Tester (42142/42143)
Power	AAA Rechargeable NiMH Battery (Battery Charger not included)
Software (ADV Models Only)	Windows Excel Software

3.5 Dimensions and Weights (Approximate)

Dimensions/Weights	Electronic Mold Hardness Tester (42142/42143)
Length	102 mm (4 in.)
Width	64 mm (2.5 in.)
Height	32 mm (1.25 in.)
Weight	Tester only - .17 kg (.37 lbs.)

4 Unpacking and Installation

4.1 Unpacking and Parts List

Check the package for transport damages upon receipt and completeness of the order in accordance with the Packing List. Any transport damage or missing parts should be reported immediately to both the carrier and equipment supplier.

Protect the device from atmospheric conditions that may be harmful. Failure to follow this instruction may nullify any claims under warranty.

The basic model should have the following: (See Figure 1)

- » Electronic Mold Hardness Tester Unit (0042142/00142143)
- » AAA Battery (Ni-MH rechargeable is included)
- » Holster

Figure 1: Model 42142 & 42143

The advanced model (indicated by the subscript “ADV” in the part number) should have the following: (See Figure 2)

- Electronic Mold Hardness Tester - Advanced
- (No. 0042142ADV/0042143ADV)
- AAA Battery (Ni-MH rechargeable is included)
- Infrared receiver assembly; including receiver, and USB cable.
- Calibration assembly, including mount and micrometer and Aluminum foot.
- Holster
- Aligning Allen wrench

Figure 2: Model 42142ADV & 42143ADV

4.2 Preparation - Battery Status

The unit comes complete with a rechargeable Ni-MH AAA battery that can be charged in any standard battery charger (not included). The Ni-MH battery that comes with the unit should be fully charged according to the OEM's battery charger (not included) before use. The battery has a life of 8+ hours and may be recharged a total of 500 times before it must be replaced.

Use only the battery specified for the tester in this manual.

Always ensure that the positive (+) and negative (-) ends of the battery are facing correctly when loading battery into the tester.

Always safely dispose of the battery according to local regulations.

Never expose battery to direct heat or dispose of it by incineration!

Improperly using the battery can cause it to leak and damage nearby items and may cause the risk of fire or personal injury.

Figure 3

4.3 Installing Software and Connection to PC for Part No. 0042142ADV & 0042143ADV

1. Insert the supplied USB thumb drive into your computer's USB port and copy the file Simpson eLab x86 x64 r1 to a convenient location on your hard drive. If you wish, you can make a shortcut Icon on your desktop for quick access.
2. Follow the instructions included on the enclosed thumb drive to transfer the data.
    a. Process to verify if PC recognized the USB cable.
    b. Process to allow to open macros in excel.
    c. Process to collect data from the equipment.
3. Save the USB thumb drive as your master for the program file. Do not link any data to the supplied thumb drive.
4. If you have trouble installing the software, see the back cover for contacting us.
5. Assemble the cord (Figure 4). The "USB" connector plugs into the USB port of the PC. Position the IR receiver facing the Infrared Data Port from the Tester.

Figure 4: USB Cable and Infrared IR Receiver

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.

Use only the battery specified for the tester in this manual. Ensure that the positive (+) and negative (-) ends of the battery are facing correctly when loading battery into the tester.

Always safely dispose of the battery according to local regulations.

Never expose battery to direct heat or dispose of it by incineration!

Improperly using the battery can cause it to leak and damage nearby items and may cause the risk of fire or personal injury.

5.1 Description

Mold hardness, as determined by the Electronic Mold Hardness Tester (Part No 0042142/0042143/0042142ADV/0042143ADV), 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 by having a load applied at a 90-degree angle to the mold surface.

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

The advanced model allows you advanced software function and the ability to download up to 900 data points to a computer for analysis.

- Refer to Figures 5-7 for location of the various components while following this instruction manual:

Figure 5

Item	Description
1	Penetrator
2	MENU Button
3	UP Button
4	RIGHT Button
5	ENTER Button
6	LCD Screen

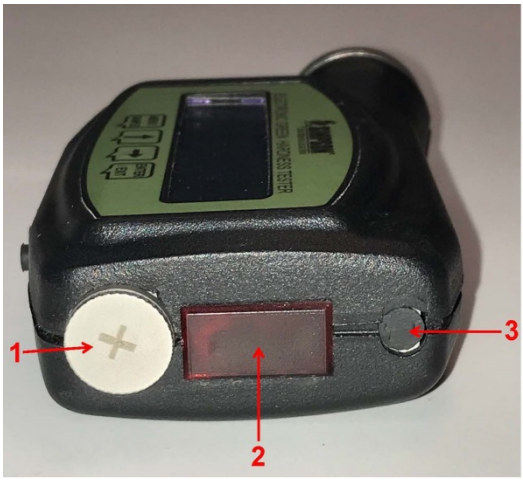

Figure 6

Item	Description
1	Battery Compartment
2	Infrared Data Port
3	Covered Spring Port (DO NOT REMOVE RUBBER COVER)

Figure 7: Penetrator (1) Penetrator Face (2) and Body (3)

5.1.1 Type “B” and “C” Scale Description

There are two types of scale for measuring mold hardness. Model 42142 is the B-Scale (round penetrator) measuring; Model 42143 is the C-scale (pointed penetrator). Both scales measure the surface hardness of the mold by penetration. The difference between the two depends on the load and on the shape of the penetrator (see Figure 8). Please note that the schematics are for reference only and are not drawn to the exact shape or size.

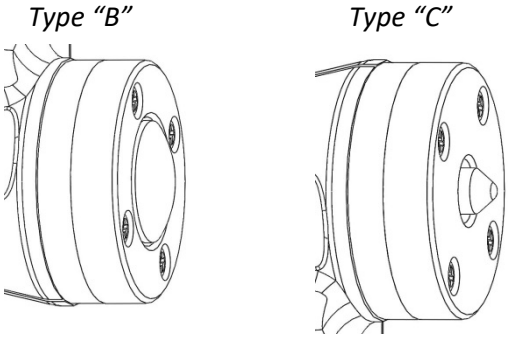

Figure 8

5.2 First Use

S	I	M	P	S	O	N		-		G	E	R	O	S	A
			U	s	e	R			N	a	m	e			

Figure 9

1. Turn the instrument on by pressing the <ENTER> button. Hold <ENTER> button for at least 3 seconds to stabilize the power supply.

If the unit does not seem to respond to a button, hold it in for a moment longer.

2. The unit will display a series of screens, beginning with the one shown in Figure 9 above and changing at a rate of about 2 seconds. It will cycle through these until it reaches the fifth screen, which is the **Work** mode screen (see Figure 11).

If you press any key before the cycle is done, the cycle will stop. Press <MENU> button until you reach the work mode screen. Begin when the cursor is flashing. On the LCD screen, only the option above the flashing cursor may be edited.

3. **Button operation**: To complete any operation, a button should be held until the operation is performed.

The hardness tester will turn itself off, even when the work mode flag is on **Wk**, after one minute of inactivity for conserving battery power. The charge can be monitored in the **Setup** mode, **Timer and Battery Status**, Section 5.5. The tester will not turn itself off in the **Timer and Battery Status** mode.

5.3 Working Modes Screen Description

5.3.1 Basic Model

M	d		P	o	i	n	t		S	T	O		N	o	
0	0	:	0	0	0	0	0	0				0	0	0	

Figure 10

1. The hardness displacement is shown in the bottom right of the LCD, its range is in imperial mode (mils) from 000 to 118 mils (0 to 3 mm in metric system). When you turn on the instrument it should read 000. The unit was calibrated before it was sent and is ready for use.
2. In the upper left corner of the display is the letters **Md**, this represents 'mode'. The starting mode is **Point** (see Figure 10). You may cycle through modes by pressing the <UP> button when the cursor is under the 'P' (see Figure 10).

Only the Point and Read mode is available for the basic model.

W	k		P	o	i	n	t		S	T	O		N	o	
0	0	:	0	0	0	0	0	0				1	1	8	

Figure 11

3. Press <ENTER> button to start the work mode. The **Md** should change to **Wk** (work mode), indicating that the unit is ready to take readings (see Figure 11). The **Point** mode automatically holds the maximum value of hardness displacement.
4. To operate the instrument in **Point** mode, place the instrument penetrator side down parallel onto the mold surface to be tested.

Figure 12

5. Press the unit down until the penetrator face is just touching the surface of the mold.

DO NOT FORCE the penetrator face into the mold as this will make the results inaccurate (see Figure 12).

6. Record the hardness number and press <MENU> button which clears the display.

If you do not press any button for 30 seconds after a reading, the value is automatically deleted. This time can be changed in Setup.

7. Press <ENTER> button to exit from the **Point** mode. The **Wk** message in the corner of the LCD should return to **Md.**

Refer to Section 5.4 **User Information Screens** for instructions on setting the clock or go to Section 5.5 for information on changing other options.

5.3.2 Advanced Model

M	d		P	o	i	n	t		S	T	O		N	o	
0	0	:	0	0	0	0	0	0		?		0	0	0	

Figure 13

1. The hardness displacement is shown in the bottom right of the LCD, its range is in imperial mode (mils) from 000 to 118 mils (0 to 3 mm in metric system). When you turn on the instrument it should read 000. The unit was calibrated before it was sent and is ready for use.
2. In the upper left corner of the display is the letters **Md**, this represents 'mode'. The starting mode is **Point**. You may cycle through modes by pressing the <UP> button when the cursor is under the 'P' (see Figure 13). There are five modes (POINT-AVGE-SCAN- LINK - READ).
   - » Point: Takes a reading and holds the maximum.
   - » Avge: Performs a running average of multiple test points. After a reading, the unit automatically calculates and displays the average for the data series and updates the number of readings shown in the display.

» Scan: Allows the operator to test and store a series of points on the surface of a mold. The points can then be plotted as a hardness gradient. This mode is useful in determining the change in mold hardness, for instance in a deep mold pocket.

» Link: Allows the user to transfer the memory to the computer.

» Read: Only shows the displacement of the penetrator.

5.3.3 Store Data into Tester Memory

M	d		P	o	i	n	t		S	T	O		N	o	
0	0	:	0	0	0	0	0	0		?		1	1	8	

Figure 14

1. When the tester is in the **Point** mode of operation, the upper right corner of the display indicates whether the tester is set to store data into the onboard memory.
2. Choose whether to store the readings or not by setting the **STO** register to Yes or No. To change the status of the **STO** register, simply press the <RIGHT> button until you see the blinking cursor under the **STO** option (see Figure 14), then press the <UP> button for cycling the options available.
3. Once you set **STO** register to Yes, press the <RIGHT> button again. The cursor will move to the current mold number. You may change the mold by pressing the <UP> button. A total of 32 molds (00 to 31) are available to store data (see **Setup** Section 5.5 to input mold identification names and numbers.)
4. Press the <RIGHT> button to return to the mode options.
5. Once the auto store function has been turned on, the instrument will continue to store data in working modes, including **Avge** and **Scan** modes, until the **STO** register is changed.

5.3.4 Point Mode - Advanced Model

W	k		P	o	i	n	t		S	T	O		Y	e	s
0	0	:	0	0	0	0	0	0		⍰		0	5	0	

Figure 15

1. Once the cursor is under the first position of the mode register and the **Md** is displayed in the corner of the LCD, by pressing <UP> button you may change the mode.
2. Change the mode to **Point**.
3. Press <ENTER> button to start the work mode. The **Md** should change to **Wk** (work mode), indicating that the unit is ready to take readings (see Figure 15). The **Point** mode automatically holds the maximum value of hardness displacement.
4. To operate the instrument in **Point** mode, place the instrument penetrator side down onto the surface to be tested.
5. Press the unit down until the penetrator face is just touching the surface of the mold.

DO NOT FORCE the penetrator face into the mold, as this will make the results inaccurate (see Figure 12).

6. Press <MENU> button to clear the display and/or store the value. To save the values for transfer, **STO** register must be set to **YES** (refer to Section 5.4.3 Store Data into Tester Memory).

If you do not press any button for 30 seconds after a reading, the value is automatically stored or deleted. This time may be changed in the **Setup**.

7. Press <ENTER> button to exit from the **Point** mode. The **Wk** message in the corner of the LCD should return to Md.

The unit will not shut down when the **Wk** flag is displayed. To conserve battery power, return to **Md.** When the **Md** is displayed, the unit will automatically shut down after five minutes.

5.3.5 Average Mode - Advanced Model

W	k		A	v	g		0	3		X		0	2	5	
0	0	:	0	0	0	0	0	0		?		0	3	5	

Figure 16

1. Once the cursor is under the first position of the mode register and the **Md** is displayed in the corner of the LCD, by pressing <UP> button you may change the mode.
2. Change the mode to **Avge**.
3. This is another mode of operation; press <ENTER> button to turn it on. The Avge mode displays and stores the average of the readings. It also shows the 'n' (number of readings taken). Like Point, it shows the maximum hardness displacement for the average (see Figure 16).
4. Press the unit down until the penetrator face is just touching the surface of the mold.

DO NOT FORCE the penetrator face into the mold, as this will make the results inaccurate (see Figure 12).

5. Press <MENU> button to store the value which increases the number of readings and changes the average.

If you do not press any button for 30 seconds after a reading, the value is automatically stored or deleted. This time may be changed in the **Setup**.

6. Press <ENTER> button to exit from the **Avge** mode. The **Wk** message in the corner of the LCD should return to **Md**.
7. Once you enter the complete name, press <ENTER> button again to quit.
8. Pressing <MENU> button will change to the next screen.

5.3.6 Scan Mode - Advanced Model

W	k		S	c	a	n			N	:		0	9		
0	0	:	0	0	0	0	0	0		?		0	2	5	

Figure 17

1. Once the cursor is under the first position of the mode register and the **Md** is displayed in the corner of the LCD, by pressing <UP> button you may change the mode.
2. Change the mode to **Scan**.
3. This is another mode of operation, press <ENTER> button to turn it on. The Scan mode allows the user to take readings from a mold, by sampling a sequence of points. It also shows the 'n' - number of readings taken (see Figure 17).
4. Press the unit down until the penetrator face is just touching the surface of the mold.

DO NOT FORCE the penetrator face into the mold, as this will make the results inaccurate (see Figure 12).

5. Record the reading in the lower right corner of the display.
6. Press <MENU> button to store the value and increments of the number of readings. Press <ENTER> button to exit from the **Scan** mode. The **Wk** message in the corner of the LCD should return to **Md**.

If you do not press any button for 30 seconds after a reading, the value is automatically stored or deleted. This time may be changed in the **Setup**.

7. Press <ENTER> button to exit from the **Scan** mode. The **Wk** message in the corner of the LCD should return to **Md**.

5.3.7 Link Mode - Advanced Model

1. The stored data points in the onboard memory may be downloaded to a computer by using the IRED Link (from the handheld tester). The information is sent to the PC by an infrared port (Figure 6, Item 2), which is in the back of the tester.

Be sure the supplied software is installed on your PC, for instructions see Section 4.3.

2. To send the stored data the tester must be put into the **LINK** mode of operation. This is done by using the <ENTER> button (Figure 5, Item 5) to change display from **WK** to **MD** on the **LCD** Screen (Figure 5, Item 6). Then the mode of operation can be changed by using the <UP> button (Figure 5, Item 3) to get to the **LINK** mode.

3. Press <ENTER> button (Figure 5, Item 5) to activate the SERIAL IRED LINK (See Figure 18).

S	E	R	I	A	L		I	R	E	D		L	I	N	K
W	a	i	t	i	n	g			C	o	m	m	a	n	d

Figure 18

4. Press <MENU> button (Figure 5, Item 2) to send the data, or <ENTER> button (Figure 5, Item 5) to exit this mode. If you press <MENU> button (Figure 5, Item 2), make sure the unit is positioned in line with the infrared receiver (tester end facing the IR receiver), (See Figure 19). Keep the unit in this position until all the data is transferred.

S	E	R	I	A	L		I	R	E	D		L	I	N	K
X	M	i	t		D	a	t	a	:			0	0	2	5

Figure 19

Make sure the unit is positioned in line with the infrared receiver. Keep the unit in this position until all the data is transferred.

5. After the transfer is finished, you will be prompted to select Yes or No to CLEAR MEMORY (see Figure 20). If you select Yes, you will be prompted to confirm the operation.

Be Careful! Selecting and confirming Yes will CLEAR MEMORY, and once you have cleared all memory, you cannot recover the information.

	C	L	E	A	R		M	E	M	O	R	Y	?		
Y	e	s												N	o

	A	R	E			Y	O	U			S	U	R	E	?
Y	e	s												N	o

Figure 20

5.4 User Information Screens

There are five information screens in addition to the work mode screen (USERNAME-SCALE-CALIBRATION-DATE-WORK). Cycle through the beginning screens by pressing <MENU> button from the working modes screen.

5.4.1 Username Screen Description

S	I	M	P	S	O	N		-		G	E	R	O	S	A
			U	s	e	r			N	a	m	e			

Figure 21

1. This screen shows the current username (see Figure 21). The only function available in this screen is a key combination to enter the SETUP MODE, see the section on Setup Screens) (see Section 5.5, Figure 25).
2. Press <MENU> button to switch to the next screen.

5.4.2 Current Scale Type Screen Description

H	A	R	D	N	E	S	S			T	E	S	T	E	R
				B		S	c	a	l	e					

Figure 22

This screen shows the current scale type (see Figure 22). No other function is available on this screen. Pressing <MENU> button will change to the next screen. The two B and C scales are discussed in Section 5.1.1.

5.4.3 Last Calibration Screen Description

L	A	S	T		C	A	L	I	B	R	A	T	I	O	N
0	5	/	2	6	/	2	0	1	0		1	5	:	3	0

Figure 23

This screen shows when the hardness displacement sensor was last calibrated (see Figure 23). No other function is available on this screen. Pressing <MENU> button will change to the next screen.

5.4.4 Actual Date/Time Screen Description

A	C	T	U	A	L		D	A	T	E	/	T	I	M	E
0	4	/	2	6	/	2	0	1	0		1	5	:	3	0

Figure 24

1. This screen shows the actual time and date (see Figure 24). A clock is embedded into the instrument; its operation is shown by the flashing colon. Using this screen, you may set the date.
2. Press <ENTER> button, a cursor will appear on the left of the screen, under the month. The <UP> button will increase the number, and the <RIGHT> button will advance the cursor position.
3. To exit the editing mode, simply press <ENTER> button again.
4. Pressing <MENU> button will return you to work mode screen.

5.5 Setup Description

S	I	M	P	S	O	N		-		G	E	R	O	S	A
			U	s	e	r			N	a	m	e			

Figure 25

1. Setup has 5 option screens:

(USERNAME MOLD IDENTIFICATION NAME - CALIBRATION - TIMER AND BATTERY STATUS - MEMORY). You may cycle through these by pressing the <MENU> button.

2. Enter setup mode by returning to the USERNAME screen (see Figure 25). Hold the <UP> button for four seconds, then hold the<RIGHT> button for four seconds until the screen changes as below (see Figure 26).

5.5.1 Editing Username

	E	D	I	T		U	S	E	R		N	A	M	E	
			U	s	e	r			N	a	m	e			

Figure 26

1. To enter the edit mode, press <ENTER> button, and a cursor will appear (see Figure 27).

	E	D	I	T		U	S	E	R		N	A	M	E	
_			U	s	e	r			N	a	m	e			

Figure 27

3. Advance the cursor by pressing the <RIGHT> button.
4. To change the characters, press <UP> button. The number of characters will increase by one character in a cyclical fashion.
5. To increment backward, press <MENU> button. This will advance in the reverse direction in a cyclical fashion.

5.5.2 Editing Mold Identification Name

	E	D	I	T		M	O	L	D		N	A	M	E	
	m	o	l	d		0	1	:	0	0	0	0	0	0	

Figure 28

1. This screen is available to edit the name given to a particular mold or pattern number (see Figure 28). First, choose a mold number for editing the name. There are 32 (00-31) mold numbers to choose from.
2. To increment the current mold number, simply press the <UP> button.
3. In the same way, to de-increment the mold number, press the <RIGHT> button.

	E	D	I	T		M	O	L	D		N	A	M	E	
	m	o	l	d		0	1	:	0	0	0	0	0	0	

Figure 29

4. After you choose a mold number, press <ENTER> button to edit the mold number's name. The cursor should appear under the first character of the name (see Figure 29). To edit the name, proceed as with the USERNAME screen. You have six characters with which to name a mold number.
5. Advance the cursor by pressing the <RIGHT> button.
6. To change the characters, press the <UP> button. The number of characters will increase by one character, in a cyclical fashion.
7. To increment backwards, press <MENU> button. This will advance in the reverse direction in a cyclical fashion.
8. Once you enter the complete name, press <ENTER> button again to quit.
9. Pressing <MENU> button will change to next screen.

5.5.3 Setting Calibration Points

S	E	T		C	A	L	I	B		P	O	I	N	T	S
R	e	a	l		V	a	l	u	e		0	2	0	4	

Figure 30

1. This screen is used for calibrating the Hardness Displacement Sensor (see Figure 30). The calibration process is easy and quick.
2. Push the penetrator to see how it changes the reading in the lower right corner of the display.
3. To start the displacement calibration, insert the hardness tester into the calibration device (see Figure 31). Orient the micrometer so that it is simple to turn and read the increments. The process requires that you set seven points.

Figure 31

4. After you have installed the hardness tester into the calibration device and have the calibration screen on, you are ready to set the first point.
5. Adjust the micrometer until it is just touching the penetrator (see Figure 32). Note the reading on the micrometer. To be sure that the micrometer is just touching the penetrator, continue adjusting the micrometer until the reading increments by one, then back off just enough to return to the original value.

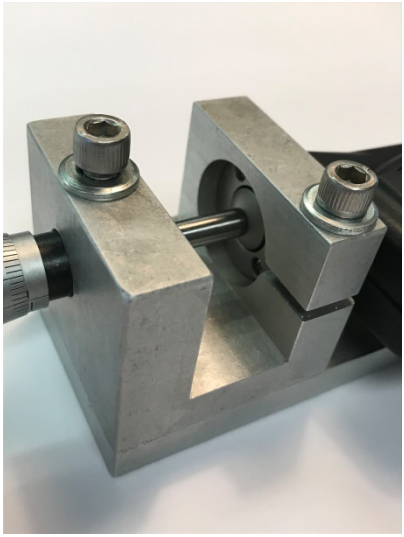

Figure 32

6. Press <ENTER> button to enter into the calibrating mode (see Figure 29).

S	E	T		C	A	L	I	B		P	O	I	N	T	S
S	e	t		0	.	0		m	M		0	0	9	0	

Figure 33

7. Once the micrometer is set, press <MENU> button to store the first point. This is the zero reference. The screen will change to set the second point, 0.5mm (see Figure 33).
8. Turn the micrometer one whole turn from the first micrometer reading, this is 0.5мм.

S	E	T		C	A	L	I	B		P	O	I	N	T	S
S	e	T		0	.	5		m	m		0	8	4	0	

Figure 34

9. Press <MENU> button to store the second point.
10. Repeat this process, turning the micrometer 0.5 mm (one whole turn), for each point, until you have reached 3.0 mm total.
11. If you want to abort the process in the middle, simply press <ENTER>button.

You will save calibration information when you finish with your last point (3.0 mm), after that point, the instrument exits the calibration mode.

12. After calibration, press <MENU> button to change to next screen.

5.5.4 Timer and Battery Status

	A	O	F	T		A	S	T	O		B	A	T	T	
	3	0	.	0		0	2	0	0		1	.	6	1	

Figure 35

1. This screen allows you to adjust two things, AOFT and ASTO. BATT refers to the battery power left (see Figure 35).
2. AOFT is the automatic offset reading. Changing this will clear the display in more or less time. It is measured in seconds. You can change the time by pressing the <ENTER> button. This cycles the time by 0.5 sec from 18.0 to 0.0.
3. ASTO is the number of the minimum reading before the timer is activated. Increase the value by pressing the <UP> button. Decrease the value by pressing the <RIGHT> button. There is one decimal point in the number; example: 0200 is 20.0. This is your minimum reading.

4. BATT shows the remaining battery power. The battery may be recharged up to 500 times, after which it must be replaced. This allows you to monitor the battery's charge.

5. Press <MENU> button to change to the next screen.

5.5.5 Viewing Memory Status - Setup Description

M	E	m	o	r	y		U	s	e	d		0	3	2	0
M	E	m	o	r	y		L	e	f	t		7	3	6	0

Figure 36

1. This shows the amount of memory used, and how much memory is free (see Figure 36). The total amount of memory is 7680 bytes (960 readings!) for intensive sampling.

If you press <RIGHT> button, you reset the memory. This will erase the sample information stored in the onboard memory. Use extreme care not to reset the memory unless you purposely intend to clear the memory.

2. *REMEMBER!!* If you press <RIGHT> button, like the SERIAL IRED LINK, you will be given a prompt warning that the memory will be lost. Therefore, take extreme care not to reset the memory, unless you purposely intend to clear the memory (see Figure 37).

M	e	m	o	r	y		U	s	e	d		0	0	0	0
M	e	m	o	r	y		L	e	f	t		7	6	8	0

Figure 37

5.5.6 Exiting Setup Mode

To exit the SETUP MODE, you must cycle through all the setup screens. After you have reached the memory screen, prethe <MENU <MENU> button once more will get the screen out of setup and to the Username screen and the instrument will return to normal operation.

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 Daily Maintenance

- Keep the Electronic Mold Hardness Tester surface clean so that buildup of sand does not occur.

6.2 When Required

- When the battery voltage is low you can remove it from the device by removing the battery cover (Figure 6, Item 1) that can be charged in any standard battery charger (not included). The battery has a life of 8+ hours and may be recharged a total of 500 times before it must be replaced.

6.3 Care for Your Electronic Mold Hardness Tester

Take care of your electronic hardness tester, by practicing the following suggestions:

- Do not handle the instrument roughly, especially dropping the instrument.
- Do not expose the instrument to moisture.
- Do not scratch the screen; this will impair viewing.
- Read this manual before operating the instrument.
- The extreme operating temperature spans from 0-45°C (32-113° F.).

6.4 Warranty, Service, Calibration and Support

2. There is a one-year warranty on the instrument.

The warranty is void if the housing is tampered with and/or opened. Also, the warranty is void if the guidelines on care in Section 3.1 are not followed, or if this instrument is used in applications for which it is not intended. Warranty does not cover calibration. Simpson Technologies reserves the right to decide the conditions under which this warranty is void.

3. Visit our website at simpsongroup.com.
4. If there are problems or if you have questions, call Simpson Technologies. See back cover for contact information.

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. Contact Simpson Technologies with the part number and description when ordering.

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 to offer the most practical flexibility, the following conditions apply to returned goods. Adherence to these procedures will ensure 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.

8 Decommissioning

Prior to a longer interruption of operation, clean the apparatus and slightly oil its blackened and bright parts. Then store it in a place where it is protected from weather influence.

Before doing any work, review the Safety Procedures in Section 2.

Failure to follow safety procedures could result in severe injury.

Use qualified personnel and follow safety procedures, applicable local policies, and regulations in decommissioning the Electronic Mold Hardness Tester Model.

The instrument consists of:

- Steel
- Aluminum
- Copper
- Plastic
- Electronic Components and circuit boards
- AAA Battery (Ni-MH Rechargeable)

Dispose of the parts in accordance with the applicable regulations.

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