

SIMPSON

A Norican Technology

Operating Instructions

Electronic Scratch Hardness Tester

Model 42145



Type:

Electronic Scratch Hardness Tester

Model No.:

42145

Part No.:

0042145

Serial No.:

Name and Address of Manufacturer:

Simpson Technologies
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Naperville, IL 60563

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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 Scratch Hardness Tester (Model 42145) 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 Scratch Hardness Tester (Model 42145) 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 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

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 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 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.

2 Safety



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

The scratch hardness of a mold or core is determined using the Simpson Electronic Scratch Hardness Tester (Model 42145). The instrument incorporates a four-point cutter that penetrates a finished core or mold surface when rotated. The depth of penetration of the cutter into the specimen determines the hardness of the core or mold. The use of advanced electronics increases the accuracy of the instrument. The Electronic Scratch Hardness Tester is lightweight, portable and engineered for foundry use.

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

3.2 Software Functions

- Store and display date of last calibration
- Store and display username
- Point to Point mode
- Store up to 900 data points
- Identify up to 32 molds
- Digital calibration of displacement
- Infrared data transfer to computer

3 Short Description & Specifications

3.3 Specifications

Requirements	Electronic Scratch Hardness Tester (42145)
Power	AAA Rechargeable NiMH Battery (Battery Charger not included)
Software	IBM Compatible, Windows Software

Dimensions/Weights	Electronic Scratch Hardness Tester (42145)
Length	140 mm (5.5 in.)
Width	64 mm (2.5 in.)
Height	32 mm (1.25 in.)
Weight	Tester only - .25 kg (.55 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 following equipment should be included in the package:

(Figure 1)

- » Electronic Scratch Hardness Tester Unit
- » Infrared IR receiver unit, USB cable
- » AAA Battery (Ni-MH rechargeable is included)
- » Calibration assembly; including mounting fixture, micrometer and, aluminum foot (for use in manufacturer's calibration; call Simpson for details)
- » USB thumb drive (including instructions and drivers to download data)
- » Holster

4 Unpacking and Installation



Figure 1

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 2

4.3 Installing Software and Connection to PC

1. Insert 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 3). The "USB" connector plugs into the USB port of the PC. Position the IR receiver facing to the Infrared Data Port from the Tester.

4 Unpacking and Installation



Figure 3: 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.

5.1 Description

Scratch hardness of a mold the measurement of the surface hardness of the mold. This is accomplished by removing material on the surface of the mold and measuring the depth of penetration.

- Refer to Figures 4-6 for location of the various components while following this instruction manual:



Figure 4

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



Figure 5

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



Figure 6: Collar (1) Penetrator (2) and Body (3)

5.2 User Information Screens

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

5.2.1 User Name Screen Description

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

Figure 7

1. This screen shows the current username (Figure 7). The only function available in this screen is a key combination to enter the SETUP MODE, see the section on Setup Screens.
2. Press MENU to switch to the next screen.

5.2.2 Current Scale Type Screen Description

H	A	R	D	N	E	S	S			T	E	S	T	E	R
						C	o	r	e						

Figure 8

This screen shows the current scale type (Figure 8). No other function is available on this screen. Pressing MENU will change to next screen.

5.2.3 Last Calibration Screen Description

L	A	S	T		C	A	L	I	B	R	A	T	I	O	N
0	4	/	2	6	/	2	0	1	0		1	5	:	3	0

Figure 9

This screen shows when the hardness displacement sensor was last calibrated (Figure 9). No other function is available on this screen. Pressing MENU will change to next screen.

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5.2.4 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 10

1. This screen shows the actual time and date (Figure 10). 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, a cursor will appear in the left of the screen, under the month. The UP arrow will increment the number, and the RIGHT arrow will advance the cursor position.
3. To exit the editing mode, simply press ENTER again.
4. Pressing MENU will return you to work mode screen.

5.3 Setup Description

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

Figure 11

1. Setup has 5 option screens:

USER NAME - 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 the USER NAME screen (Figure 11). Hold the UP arrow for four seconds, then hold the RIGHT arrow for four seconds until the screen changes as below (Figure 12).

5.3.1 Editing User Name

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

Figure 12

- To enter the Edit mode, press ENTER, and a cursor will appear (Figure 13).

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

Figure 13

- Advance the cursor by pressing the RIGHT arrow.
- To change the characters, press UP arrow. The characters will increment by one character, in a cyclical fashion.
- To increment backwards, press MENU. This will advance in the reverse direction in a cyclical fashion.

5.3.2 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 14

- This screen is available to edit the name given to a particular mold or pattern number (Figure 14). First, choose a mold number to edit the name of. There are 32 (00-31) mold numbers to choose from.
- To increment the current mold number, simply press the UP arrow.
- In the same way, to decrement the mold number, press the RIGHT arrow.

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

Figure 15

- After you choose a mold number, press ENTER to edit a mold number's name. The cursor should appear under the first character of the name (Figure 15). To edit the name, proceed as with the USER NAME screen. You have six characters with which to name a mold number.

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5. Advance the cursor by pressing the RIGHT arrow.
6. To change the characters, press the UP arrow. The characters will increment by one character, in a cyclical fashion.
7. To increment backwards, press MENU. This will advance in the reverse direction in a cyclical fashion.
8. Once you enter the complete name, press ENTER again to quit.
9. Pressing MENU will change to next screen.

5.3.3 Calibration Points

See 6.3 of the Calibration and Maintenance.

5.3.4 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 16

1. This screen allows you to adjust two things, AOFT and ASTO. BATT refers to the battery power left (Figure 16).
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 ENTER. This cycles the time by 0.5 seconds 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, for 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 this, it must be replaced. This allows you to monitor the battery's charge.
5. Press MENU to change to next screen.

5.3.5 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 17

1. This shows the amount of memory used, and how much memory is free (Figure 17). The total amount of memory is 7680 bytes (960 readings!) for intensive sampling.



If you press RIGHT, 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, like the SERIAL IRED LINK, you will be given a prompt warning that the memory will be lost. Therefore, use extreme care not to reset the memory unless you purposely intend to clear the memory (Figure 18).

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 18

5.3.6 Exiting Setup Mode

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

5.4 First Use

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

Figure 19

1. Turn the instrument on by pressing the ENTER button. Hold ENTER 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.

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2. The unit will display a series of screens, beginning with the one shown in Figure 19 above and changing at a rate of about 2 seconds. It will cycle through these until it reaches the fifth screen; that is the work mode screen.



If you press any key before the cycle is done, the cycle will stop, press MENU 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:** In order to complete any operation, a button should be held until the operation is performed.



The hardness tester will turn off, except when the work mode flag is on **Wk**, after five minutes of inactivity for conserving batter power. The charge can be monitored in the **Setup** mode, **Timer** and **Battery Status**. The tester will not turn itself off in the **Timer** and **Batter Status** mode.

5.5 Working Modes Screen Description



Figure 20

1. 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 (Figure 20)



Refer to Section 5.2 **User Information Screens** for instructions on setting the clock or go to 5.3 **Setup Screen** for information on changing other options.

M	d		<u>P</u>	o	i	n	t		S	T	O		N	o	
0	0	:	0	0	0	0	0	0		?		0	0	0	

Figure 21

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 are the letters **Md**; this represents 'mode'. The starting mode is **Point**. You may cycle through modes by pressing the UP arrow when the cursor is under the 'P' (Figure 21). There are three modes (POINT- LINK - READ).
 - » **Point:** Takes a reading and holds the maximum.
 - » **Link:** Allows the user to transfer the memory to the computer.
 - » **Read:** Only shows the displacement of the penetrator.

5.5.1 Store Data Into Tester Memory

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

Figure 22

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 arrow until you see the blinking cursor under the **STO** option (Figure 22), then press the UP arrow for cycling through the options available.
3. Once you set the **STO** register to Yes, press the RIGHT arrow again. The cursor will move to the current mold number. You may change the mold by pressing the UP arrow. A total of 32 molds (00 to 31) are

5 Operating Instructions

available to store data (see 5.3.2 in Setup section to input mold identification names and numbers).

4. Press the RIGHT arrow to return back to the mode options.
5. Once the auto store function has been turned on, the instrument will continue to store data in working modes until the **STO** register is changed.

5.5.2 Point Mode

W	k		<u>P</u>	o	i	n	t			A	L	I	G	N	
0	0	:	0	0	0	0	0	0		?		0	5	0	

Figure 23

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 you may change the mode.
2. Change the mode to **Point**.
3. Press ENTER to start the work mode. The **Md** should change to **Wk** (work mode), indicating that the unit is ready to take readings (Figure 23). The **Point** mode automatically holds the maximum value of hardness displacement.
4. Rotate the collar until the display changes from the Align command to the counter display (Figure 24).
5. To operate the instrument to **Point** mode, place the instrument penetrator side down onto the surface to be tested.
6. 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 (Figure 20)

W	k		<u>P</u>	o	i	n	t			n	:	0	0		
0	0	:	0	0	0	0	0	0		?		0	0	0	

Figure 24

7. Rotate the collar three revolutions. The upper right corner of the display will increment every 90°. This should read 12 after completing the revolutions.
8. Press MENU to clear the display and/or store the value. In order to save the values for transfer, the **STO** register must be set to **YES** (refer to Section 5.5.1 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**.

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

5.5.3 Link Mode

1. The stored data points in the onboard memory may be downloaded to a computer by using the IRED Link (from the hand held tester). The information is sent to the PC by an infrared port (Figure 5, Item 2), which is located in the back of the tester.
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 4, Item 6) to change display from **WK** to **MD** on the LCD Screen (Figure 4, Item 2). Then the mode of operation can be changed by using the **UP** button (Figure 4, Item 4) to get to the **LINK** mode.
3. Press **ENTER** (Figure 4, Item 6) to activate the SERIAL IRED LINK (See Figure 25).

5 Operating Instructions

S	E	R	↓	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 25

4. Press **MENU** (Figure 4, Item 3) to send the data, or **ENTER** (Figure 4, Item 6) to exit this mode. If you press **MENU** (Figure 4, Item 3), make sure the unit is positioned in line with the infrared receiver (tester end facing the IR receiver), (See Figure 25A). Keep the unit in this position until all of the data is transferred.

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

Figure 25A

5. After the transfer is finished, you will be prompted to select YES or NO to CLEAR MEMORY (Figure 26). If you select YES, you will be prompted to confirm the operation.



Be careful! Selecting and confirming Yes will CLEAR MEMORY, and once that 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 26

5.6 Input Data to Excel Spreadsheet

Once you have stored data in the instrument's memory, you may save it directly into an excel spreadsheet. To input data from the instrument to the program perform the following:

1. Open the Excel Workbook (Simpson eLab x86 x64 r1.xls) that has been saved in your PC on your convenient location.

2. A Macros window will appear. Click on Enable Macros. (If no Macros window appears, ensure Macros are enabled.) Another information window will appear; click on OK.



If Macros window does not appear when opening Excel Link, you must reset your security level to MED. If security is set as HIGH, Macros window will not appear.

If Macros is not enabled, data will not transfer from tester to spreadsheet.

To change security level, you must be in Excel and follow instructions for the supplied "2_Process to allow open macros in Excel" in the included thumb drive,

3. At the bottom of the spreadsheet you will see two tabs, Hardness Tester Data and Config. Do not change any settings in the Config. Screen.
4. To input data you must be in the Hardness Tester Data screen.
5. Follow Link instructions in Section 5.5.3.
6. After data is downloaded, the spreadsheet must then be saved to a new file name. It is recommended to do this as the link function interferes with the mouse operation.
7. After saving to a new file name, work in this file. When opening file click on Disable Macros. Also, delete the Config. Tab as this is not needed in your work file.

Hardness ID	User Name	Work Mode	Scale Type	Date	Time	Hardness	Mold Number	Mold Name	Quarter Turns	Res'd
"10300002"	"User Name"	Point	B Scale	6/13/2002	12:10	32.114	14	"000000"	0	0

Figure 27

8. For spreadsheet information (Figure 27). This is the data spreadsheet showing one line of typical test data.
9. If you have trouble installing the software and/or with data transfer, see the back cover for contacting us.

6 Calibration, Maintenance and Warranty

6 Calibration, Maintenance and Warranty



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.

Despite its robust construction, the Electronic Scratch Hardness Tester (Model 42145), is a precise mechanical/electronic measurement device and needs appropriate care.

6.1 Daily Maintenance

- Keep the Electronic Scratch 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 5, 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.



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 (See Figure .2)

Always safely dispose of the battery according to local regulations.



Never expose battery to dispose of it by incineration!

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

6.3 Setting Calibration Points

1. Enter setup mode by returning to the USER NAME screen (Figure 14). Hold the UP arrow for four seconds, then hold the RIGHT arrow for four seconds until the screen changes as below. This screen is used for calibrating the Hardness Displacement Sensor (Figure 28). The calibration process is easy and quick.

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 28

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 (Figure 29a). Orient the micrometer so that it is simple to turn and read the increments. The process requires that you set seven points.



Figure 29a

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.

6 Calibration, Maintenance and Warranty

- Adjust the micrometer until it is just touching the penetrator (Figure 29b). 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 29b

- Press ENTER to enter the calibrating mode (Figure 30).

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 30

- Once the micrometer is set, press MENU to store the first point. This is the zero reference. The screen will change to set the second point, 0.5mm (Figure 31).
- Turn the micrometer one whole turn from the first micrometer reading; this is 0.5mm.

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 31

9. Press MENU 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.



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

12. After calibration, press MENU to change to next screen.

6.4 Care for Your Electronic Scratch Hardness Tester

Take care of your Electronic Hardness Tester, by following these 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 32-113 degrees Fahrenheit (0-45 degrees C).

6.5 Warranty, Service and Support

1. 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 6.4 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

2. Visit our website at simpsongroup.com.
3. 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 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 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.

8 Decommissioning

8 Decommissioning

Prior to a longer interruption of operation, clean the apparatus and slightly oil its blackened and bright parts. Then store it at 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 serious injury

Use qualified personnel and follow safety procedures, applicable local policies and regulations in decommissioning the Electronic Scratch 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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