R7930

REED INSTRUMENTS

Professional Ultrasonic Thickness Gauge



WARRANTY 1 YEAR WARRANTY

Instruction Manual

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Introduction

Thank you for purchasing your REED R7930 Ultrasonic Thickness Gauge. Please read the following instructions carefully before using your instrument. By following the steps outlined in this Manual, your meter will provide years of reliable service.

Product Quality

This product has been manufactured in an ISO9001 facility and has been calibrated during the manufacturing process to meet stated product specifications. If a certificate of calibration is required please contact the nearest authorized REED distributor or authorized Service Center. Please note an additional fee for this service will apply.

Safety

Never attempt to repair or modify your instrument. Dismantling your product, other than for the purpose of replacing batteries, may cause damage that will not be covered under the manufacturer's warranty. Servicing should only be provided by an authorized service center.

Features

- Measures a wide range of material including; metals, plastic, ceramics, composites, epoxies, glass, and other ultrasonic conductive materials
- Rugged anodized aluminum housing
- Easy-to-read backlit LCD display
- User selectable unit of measure (in/mm)
- Internal memory stores up to 500 measurements
- Displays sound velocity at the touch of a button
- Zero adjustment button
- User adjustable High/Low alarms
- Built-in two-point calibration function
- Auto sleep, shut off and low battery indicator

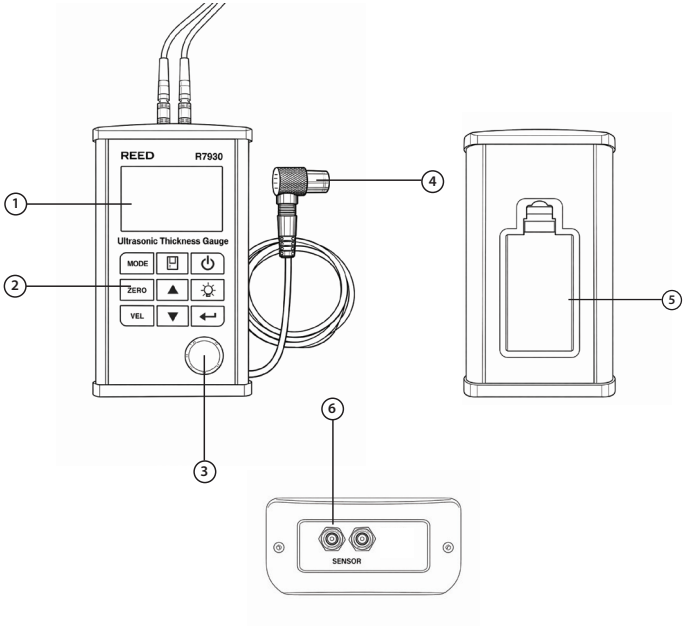
Included

- Ultrasonic Thickness Gauge
- Ultrasonic Couplant Gel
- Probe
- Hard Carrying Case
- Batteries

Specifications

Measuring Range:	0.03 to 15.7" (0.65 to 400mm)
Accuracy:	±0.04mm (< 10mm) ±(0.1% rdg.+ 0.04mm) (< 100mm) ±(0.3% rdg.) (> 100mm)
Resolution:	0.01mm or 0.1mm (< 100mm) 0.1mm (> 100mm)
Velocity Range:	1000 to 9999 m/s (0.039 to 0.394 in/µs)
Compatible Materials:	Ultrasonic conductive materials (ie. metals, plastics, ceramics, composites, epoxies, glass)
Sampling Time:	Less than 1 sec.
Display:	4-Digit, LCD
Backlight Display:	Yes
Probe Length:	36" (91.4cm)
Internal Memory:	Yes (up to 500 readings, 5 files up to 100 each)
Low Battery Indicator:	Yes
Power Supply:	2 AA Batteries
Battery Life:	Approx. 100 hours (Alkaline)
Product Certifications:	CE
Operating Temperature:	32 to 122°F (0 to 50°C)
Storage Temperature:	-4 to 140°F (-20 to 60°C)
Operating Humidity Range:	20 to 80%
Dimensions:	5.9 x 2.9 x 1.3" (150 x 74 x 32mm)
Weight:	8.4oz (238g)

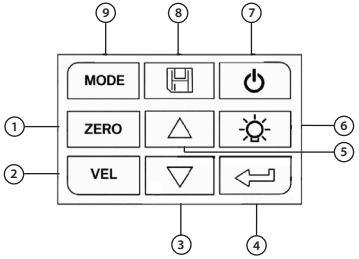
Instrument Description



1. LCD Display
2. Function Buttons
3. Calibration Test Block
4. 5MHz Ultrasonic Sensor
5. Battery Cover
6. Probe Inputs

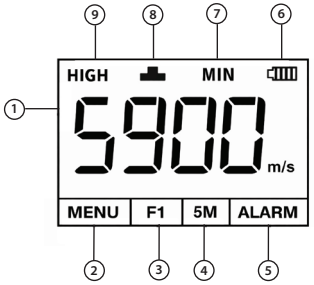
Keypad Description

1. **ZERO** Button
2. Velocity Button
3. Down Button
4. ENTER/Calibration Button
5. UP Button
6. Backlight ON/OFF Button
7. Power Button
8. SAVE/Browse Button
9. **MODE** Button



Display Description

1. Measured Value
2. Menu Settings
3. Saved File Name
4. Ultrasonic Sensor Frequency
5. Alarm Thickness Settings
6. Battery Status Indicator
7. Minimum Capture Mode
8. Coupling Indicator
9. Gain Indicator



Measurement Principle

The ultrasonic thickness gauge determines material thickness by measuring the time required for an ultrasonic pulse to travel through a material and reflect back from the opposite surface.

Measurement sequence:

1. Ultrasonic pulse is generated by the probe.
2. The pulse travels through the material.
3. The pulse reflects from the back wall.
4. The echo returns to the probe.
5. The instrument measures the round-trip time.
6. The thickness is calculated using sound velocity.

Thickness is calculated using:
Thickness = (Velocity × Time) / 2
Where:
H = thickness
V = sound velocity in the material
T = measured round-trip transit time

Couplant Requirements

Ultrasonic measurements require a couplant between the probe and the test surface.

The couplant:

- Eliminates air between probe and material
- Allows ultrasonic energy transmission
- Improves measurement stability

Typical couplants include:

- Ultrasonic gel
- Light engine oil
- Glycerin grease
- Lubricating grease

continued…

Couplant Selection by Viscosity

Low Viscosity Couplants (Smooth Surfaces)

Low viscosity couplants flow easily and are suitable for flat, smooth surfaces.

Examples:

- Ultrasonic gel
- Light engine oil

Use low viscosity couplants when:

- Surface is smooth and clean
- Probe can sit flat on the material
- Minimal gap filling is required

High Viscosity Couplants (Rough or Vertical Surfaces)

High viscosity couplants are thicker and remain in place on uneven or vertical surfaces.

Examples:

- Glycerin grease
- Lubricating grease

Use high viscosity couplants when:

- Surface is rough or uneven
- Measuring on vertical or overhead surfaces
- Additional gap filling is required to maintain coupling.

Warning: Insufficient or improper couplant application may result in unstable or inaccurate measurements.

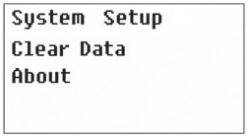
Operating Instructions

1. Connect the ultrasonic probe to the probe inputs.
2. Press, hold and release the ⏻ button for 2 seconds to turn on the meter.
3. The display will show the instrument version followed by the stored sound velocity.
4. To turn the meter off, simply press the ⏻ button once.

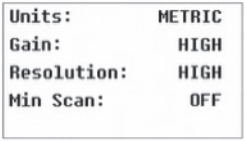


Menu Options

1. The menu controls the meter's settings and functions. Press the **MODE** button to highlight Menu on the LCD, then press the ↵ button to enter the Menu options screen.



2. Use the ▲ or ▼ button to highlight System Setup if not highlighted by default and press the ↵ button.
3. Use the ▲ or ▼ button to scroll through the following parameters:





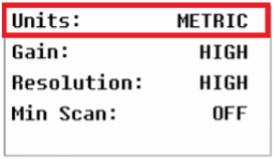
4. When the required setting as shown below, is highlighted, press the ↵ button to select it and toggle between units.
5. Once completed, press the **MODE** button twice to save and resume normal operation.

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Measurement Units

The instrument supports the following measurement units:

- Metric
- Imperial



Receiving Gain

Two receiving gain settings are available:

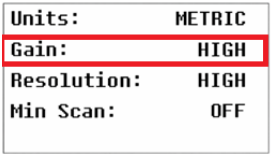
- LOW
- HIGH

LOW will reduce signal strength for thicker materials where strong echoes are naturally present (ex: steel). HIGH increases signal strength to amplify weak echoes, HIGH is recommended for attenuative materials such as rubber, cast metals, plexiglass, etc.

Display Resolution

The display resolution varies depending on the selected gain:

- LOW Gain: 0.1mm
- HIGH Gain: 0.01mm

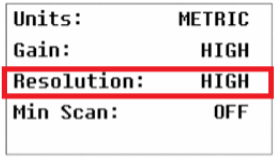


Minimum Capture Measurement

The Minimum Capture function can be set to:

- ON
- OFF

When enabled, the instrument records the minimum value detected during a measurement sequence.





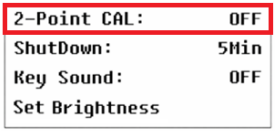
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Two-Point Calibration

The Two-Point Calibration function can be set to:

- ON
- OFF

This calibration improves measurement accuracy by using two reference samples.



Auto Power Off

Auto Power Off is a power-saving function that automatically turns the instrument off after a period of inactivity.
Available options:

- 5 minutes
- 10 minutes
- 30 minutes
- 60 minutes
- Off



Audible Beep

This function allows the user to enable or disable the audible beep produced during meter operation.
Available option:

- ON
- OFF



Display Brightness

Use the ▲ or ▼ buttons to adjust the LCD brightness.

- ▲ : Darkens the display
- ▼ : Lightens the display

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Setting Ultrasonic Sensor Frequency

1. Toggle the **MODE** button to highlight the ultrasonic sensor frequency setting on the display (e.g., 5M).
2. Continuously press the ↵ button to toggle between available frequencies. 5MHz is the frequency of the included sensor and will be displayed as "5M".



3. To exit, press the button **MODE** or by carrying out a measurement.

Available Frequencies

The instrument supports multiple probe frequencies. Each frequency is suited for different measurement conditions.

2 MHz

- Used for thick materials
- Suitable for coarse grain structures such as cast materials
- Provides deeper penetration with lower resolution

5 MHz

- General purpose measurement
- Suitable for most standard materials
- Default frequency of the included probe

7 MHz

- Used for thinner materials
- Provides higher resolution
- Suitable for precision measurements

continued…

10 MHz

- Used for very thin materials
- Provides maximum resolution
- Limited penetration depth

ZW Mode

- Used for specialized high-temperature probes
- Designed for applications requiring elevated temperature measurements

Probe Compatibility

The instrument includes a 5 MHz probe (displayed as 5M).
Other frequencies require compatible external probes.

Warning: To use 2 MHz, 7 MHz, 10 MHz or ZW modes, acompatible third-party LEMO-type probe is required. Using an incorrect or incompatible probe may result in inaccurate measurements or no readings.

Adjusting Sound Velocity

1. While the meter is on, continuously press the **VEL** button to toggle between the 5 pre-loaded sound velocities or press the ▲ or ▼ buttons to match the sound velocity of the material under test as shown in the following table.



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Material	Sound Velocity	
	m/s	in/µs
Aluminum	6320 to 6400	0.250
Zinc	4170	0.164
Silver	3607	0.142
Gold	3251	0.128
Tin	2960	0.117
Steel, Common	5920	0.233
Steel, Stainless	5740	0.226
Brass	4399	0.173
Copper	4720	0.186
Iron	5930	0.233
Cast Iron	4400 to 5820	0.173 to 0.229
Lead	2400	0.094
Nylon	2680	0.105
Titanium	5990	0.236
SUS	5970	0.240
Epoxy Resin	2540	0.100
Ice	3988	0.222
Plexiglass	2692	0.106
Grey Cast	4600	0.180
Porcelain	5842	0.230
Glass (Quartz)	5570	0.220
Polystyrene	2337	0.092
PVC	2388	0.094
Quartz Glass	5639	0.222
Rubber, Vulcanized	2311	0.091
Teflon	1422	0.058
Water	1473	0.058

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Preparing the Measurement Surface

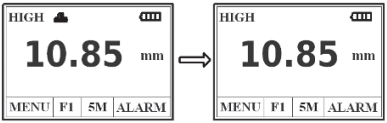
1. Clean any dust, dirt or rust off the object, and remove any coating (e.g. paint).
2. Smooth the surface of the object by grinding or polishing it. You can also use a coupling gel with a high viscosity (e.g. Glycerin grease).

Important Note: In any ultrasonic measurement scenario, the shape and roughness of the desired test material are of great importance. Rough, uneven surfaces will prevent the ultrasonic sensor from seating properly against the surface, thus limiting the penetration of ultrasound through the material, resulting in unstable and therefore, unreliable measurements.

Note: On uneven surfaces, take multiple measurements and calculate the average value to improve accuracy.

Performing Thickness Measurements

1. Set the correct sound velocity for the material.
2. Apply couplant to the clean measurement surface.
3. Place the probe firmly on the surface.
4. Wait until the coupling indicator appears.
5. Read the thickness measurement on the display.
6. Remove the probe to hold the reading on the display.



Warning: Do not perform measurements without couplant applied between the probe and test surface.

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Calibration Procedures

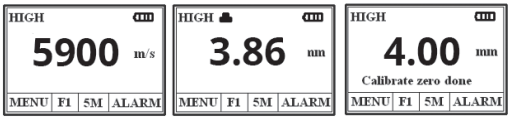
Note: For improved calibration precision, perform calibration in metric units (mm), as the instrument provides finer resolution in this mode.

Probe Zero Calibration

1. Select the correct probe frequency.
2. Set the sound velocity to 5900m/s.
3. Apply couplant to the built-in 4mm test block.

Note: Apply a small, even amount of couplant. In most applications, a single drop is sufficient to ensure proper acoustic coupling.

4. Place the probe on the test block.
5. Confirm the coupling indicator appears.
6. Press the **ZERO** button.
7. Wait for the confirmation tone indicating calibration completion.



Note: If calibration fails, the previous calibration value is retained.

Measurement accuracy should be verified after changing the probe, or when there are changes in probe temperature, ambient temperature, or working environment.

After the instrument has been used for a period of time, if measurement errors are observed, check the reading using a standard test block. If the deviation is large, perform a Zero Calibration.

During calibration, the displayed thickness may vary within 4.00 ± 0.02mm. This only indicates that the calibration process is complete, and no further calibration adjustment is required.

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Soud Velocity Measurement and Calibration

Measuring the Sound Velocity of a Material with Known Thickness

The sound velocity of a material can be determined using a test piece with a known thickness. Select a test piece with a minimum wall thickness of 20.0mm.

Before taking measurements, ensure the Minimum Capture function (Min Scan) is turned OFF (refer to the *System Setup* section).

1. Measure the thickness of the test piece using a caliper or micrometer to confirm its exact thickness.
2. Apply a small amount of coupling gel to the measurement area, then place the ultrasonic probe firmly against the surface.

Note: For most applications, a single drop of coupling gel is sufficient.

3. Remove the probe from the measurement surface. Use the ▲ / ▼ buttons to adjust the displayed thickness until it matches the actual measured thickness, then press the ↵ button to confirm.
4. The LCD will display the calculated sound velocity of the material.



5. Press the SAVE button to store the value if required.

Sound Velocity Calibration

1. Begin by performing a zero calibration of the ultrasonic probe using the built-in test block or a certified reference step block of known thickness.
2. Measure the actual thickness of the test piece using a caliper or micrometer.
3. Select any sound velocity value from the preloaded material list.

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4. Apply coupling gel to the measurement surface and place the ultrasonic probe firmly against the test piece.

Note: For most applications, a single drop of coupling gel is sufficient.

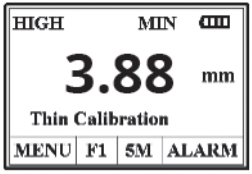
5. The LCD will display a thickness reading.

Note: The reading may be inaccurate because the selected sound velocity may not match the material.

6. Remove the probe from the test piece. Press the **VEL** button to enter the velocity adjustment interface, then gradually adjust the sound velocity using the ▲ / ▼ buttons until the displayed thickness matches the actual thickness of the test piece.

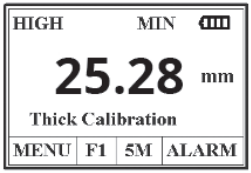
Two-Point Calibration

1. Select two standard samples of the same material to be measured:
   - One sample with a thickness equal to or slightly greater than the test piece.
   - One sample with a thickness slightly less than the test piece.
2. Before performing the 2-point calibration:
   - Turn OFF the Minimum Capture (Min Scan) function.
   - Reset the CAL data in the Clear Data Manager.
3. In the System Setup menu, set 2-Point Calibration to ON.
4. Press the **MODE** button twice to return to the main display.
5. During measurement, press the ↵ button to enter 2-Point Calibration mode.
6. Measure the thinner standard sample.
7. Remove the ultrasonic probe from the sample, then use the ▲ / ▼ buttons to adjust the displayed measurement to match the known thickness value.



continued…

8. Press the ↵ button. The LCD will prompt you to measure the thicker sample.
9. Measure the thicker standard sample.
10. Remove the ultrasonic probe and use the ▲ / ▼ buttons to adjust the measurement to the known thickness value.



11. Press the ↵ button to complete the two-point calibration.

Setting Alarm Thickness Limits

The R7930 will trigger an alarm when a measured value exceeds the preset limits.
An alarm will sound when the measurement is below the LOW limit or above the HIGH limit.
Follow the steps below to set the alarm limits:

1. Press the **MODE** button to highlight the "Alarm" setting on the LCD.
2. Press the ↵ button to access the LOW limit setting.
3. Use the ▲ / ▼ buttons to adjust the desired LOW alarm value. The minimum is 0.10mm (0.004in)
4. Press the ↵ button to save the LOW limit and proceed to the HIGH limit setting.
5. Use the ▲ / ▼ buttons to adjust the desired HIGH alarm value, then press the ↵ button to save. The limit is 310.0mm (12.205in)
6. To exit the alarm limit settings, press the **MODE** button or perform a measurement.



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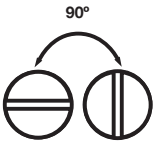
Measurement Modes

The instrument supports several measurement approaches.

Single Point Measurement

Measurement performed at a single location.

Double Measurement Method



1. Measure at one point.
2. Rotate the probe 90° (see Figure A).
3. Measure again.
4. Use the smaller value.

Multi-Point Measurement



1. Perform multiple measurements across a region.
2. Select the smallest value as the actual thickness.

Internal Memory Operation

The internal memory is divided into five files (F1–F5). Each file can store up to 100 measurement values.

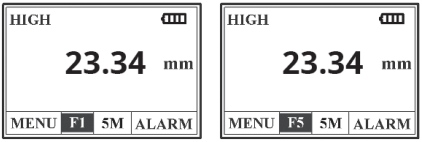
Note: Before saving data, ensure the correct file number is selected.

1. Press the 🖫 button to highlight "Save File Name" on the LCD.
2. Press the ▲ / ▼ buttons to scroll through the memory files (F1–F5).
3. Press the ↵ button to confirm the selected file and exit.

continued…

Reviewing Stored Data

1. Press the 🖫 button to highlight "Save File Name" on the LCD.
2. Press the ▲ / ▼ buttons to scroll through the memory files (F1–F5).
3. Press the ↵ button to select the desired file and view the saved measurements.



4. Use the ▲ / ▼ buttons to scroll through the stored values.
5. If required, press the ↵ button to erase the currently displayed value.

Memory Manager

1. In the menu, highlight "Clear Data" and press the ↵ button to open the menu.
2. Use the ▲ / ▼ buttons to scroll through the Memory Manager options.
3. Press the ↵ button to select the desired option:
   - Erase File – Deletes the selected file.
   - Erase All Data – Deletes all saved files.
   - Erase CAL Data – Deletes the stored calibration data.
4. Press the ↵ button again to confirm (YES), or press the MENU button to cancel and exit.

Restoring Factory Parameters

1. Enter the system menu.
2. Select the software information option.
3. Press the reset command.
4. The instrument restores default parameters and shuts down.

Battery Replacement

1. Turn off the instrument.
2. Open the battery compartment.
3. Remove the old batteries.
4. Insert two new AA batteries observing correct polarity.
5. Close the battery compartment.

Remove batteries if the instrument will be stored for long periods.

Accessories and Replacement Parts

- **R7930-PROBE** Replacement Probe
- **R7950** Ultrasonic Couplant Gel
- **R7950/5L** Ultrasonic Couplant Gel, 5L
- **R7950/12** Ultrasonic Couplant Gel, pack of 12
- **R9060** 5-Step Calibration Block
- **CA-52A** Soft Carrying Case
- **R8888** Hard Carrying Case

Don't see your part listed here? For a complete list of all accessories and replacement parts visit your product page on www.REEDInstruments.com.

Appendix

Measurements on Cylindrical Surfaces

When measuring cylindrical material, such as pipes or oil tubes, it is important to properly adjust the angle between the ultrasonic sensor's crosstalk interlayer plate and the axial line of the material being measured.

1. Couple the sensor with the material being measures
2. Make the sensor's crosstalk interlayer plate perpendicular or parallel to the axial line of the material under test.
3. Shake the sensor vertically along the axial line of the material under test, the readouts displayed on screen will change regularly
4. Use the minimum readout

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The standard for selecting the angle between the sensor's crosstalk interlayer plate and the axial line of the material under test depends on the curvature of the material under test. For a pipe with a large diameter the sensor's crosstalk interlayer plate should be perpendicular to the axial line of the material under test. For a pipe with small diameter, the sensor's crosstalk interlayer plate can be both parallel and perpendicular to the axial line of the material under test, and take the minimum readout as the thickness.

Measuring Compound Profiles

When the material being measured has a compound profile (such as a bend in a pipe), one can use the procedures to measure cylindrical surfaces. The exception is that one should have two analyses and get two results when the sensor's crosstalk interlayer plate is both parallel and perpendicular to the axial line of the material under test. Take the minimum readout as the material thickness.

Measuring an Un-Parallel Surface

To get a satisfactory ultrasonic response, the other surface of the material under test must be parallel to or co-axial with the surface being measured, otherwise it will cause a measuring error or even provide no displayed reading.

Influence of Material's Temperature

Both the thickness and transmitting speed of ultrasonic waves are influenced by temperature. If there is a high requirement of measuring accuracy, please use one of the comparison methods listed below:

1. Use a test piece of the same material being measured, under the same temperature.
2. Obtain the temperature compensation coefficient.
3. Use this coefficient to correct the actual measurement of the material being tested.

continued…

Material with Large Attenuation

Material with porous and coarse particles (such as fibre) will cause a large scatter and energy attenuation in the ultrasonic wave. This will cause abnormal readings or provide no readings on the display (generally, the abnormal readings are less than the actual thickness). These type of materials cannot be measured by our ultrasonic thickness gauges.

Measuring Castings

Castings will cause large attenuations in sound energy due to coarse crystal particles and a not-so-dense structure. The attenuation is due to the material's scatter and absorption of sound energy. Coarse out-phase structures and coarse crystal particles will cause abnormal reflection (i.e. a grass-shaped or tree-shaped echo) resulting in errors in the readings. When the crystal particle is coarse, the anisotropy in flexibility in metal's crystallizing direction will be obvious. This results in difference in sound velocities in different directions, with the maximum difference being up to 5.5%. The compactness in different positions of the workpiece is different, which will also cause difference in sound velocity. All of these will produce inaccuracies in the measurements.

While measuring castings pay attention to the following:

1. When measuring casting with an un-machined surface use engine oil, consistent grease, or water glass as a coupling gel.
2. Calibrate the sound velocity for the material under test with a standard test piece having the same material and measuring direction as that of the material being measured.
3. If necessary, take a 2-point calibration.

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Preventing Errors

Reference Test Pieces

To maintain high accuracy when taking measurements of different materials, it is important to use a standard test piece that resembles the material and conditions being measured. The ideal reference test pieces should be a group of test pieces with different thicknesses made of the same materials that is going to be measured. The test pieces can provide calibrating factors for the meter (such as the microstructure of the material, heat-treating condition, direction of particles, surface roughness, etc.). To meet the highest requirements of accuracy a set of reference test pieces are critical.

Under most situations satisfactory measuring accuracies can be met with only one reference test piece. This should be the same material and similar thickness to the material under test. Take an even-surfaced object, measure it by using a micrometer, then use it as a test piece.

For thin material, when its thickness is near to the low limit of the sensor's measuring range, use a test piece to determine the accurate low limit. Never measure a material with a thickness lower than the low limit. When the material under test is thick, especially an alloy with complex internal structure, select a test piece similar to the object from a group of test pieces, to provide an idea of calibration.

For most casting and forging, their internal structures have some direction. In different directions, the sound velocity will experience some change. To solve this problem, the test piece should have an internal structure with same direction as that of the material under test, and the transmitting direction of sound wave in it should also be same as that of the material.

Under certain circumstances, referring to a material speed-of-sound table can replace reference test pieces. The value in the speed-of-sound table may have some difference from the actual measured values due to difference in the material's physical and chemical characteristics. This is usually used for measuring low-carbon steel, and can only be taken as a rough measurement.

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Ultra-thin Material

An error will occur when the thickness of a material under test is less than the low limit of the ultrasonic sensor. When necessary, measure the minimum limit thickness by comparing it with test pieces. When measuring an ultra-thin material, sometimes errors called "double refraction" may occur. This results in a displayed measuring reading that is twice the actual thickness of the material under test. Another error result is called "pulse envelop or cyclic leap". This results in the measured value being larger than the actual thickness. To prevent these kinds of errors repeat the measurement to confirm the results.

Rust, Corrosion, and Pits

Rust and pits on the surface of the object will cause irregular change in the measured reading. In extreme situations it will even cause no readings on the display. To avoid errors, orient the sensor's crosstalk interlayer plate in different directions to take multiple measurements.

Error in Identifying Material

If calibrating the meter with one material and then measure another material, an error will occur. Be careful in selecting the correct sound velocity.

Degradation of Probe

The surface of the probe is allyl resin. Over time its roughness will increase resulting in reduced sensitivity. If it is determined that this is the reason for the errors, grind the surface with sandpaper or oilstone to make it smooth again. If the readings are still not stable, the sensor must be replaced.

Overlapped Material and Compound Material

It is impossible to measure uncoupled overlapped material because the ultrasonic wave can't pass through an uncoupled space. Since the ultrasonic wave can't transmit in a compound material in even speed, an ultrasonic thickness-gauge cannot be used to measure overlapped material and compound material.

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Influence of Metal Surface Oxidation

Some metals can produce a dense oxidation layer on the surface, such as aluminum. Even though the layer is in close contact with the substrate and provides no obvious interface, the ultrasonic wave will have different transmitting speeds in these two materials which will cause an error. In addition, different thicknesses in oxidation layers will cause different errors. Make a reference piece from a batch of objects by measuring with a micrometer or calliper, and using it to calibrate the instrument.

Abnormal Readout of Thickness

The operator should be able to identify an abnormal measuring reading. Generally the rust, corrosion, pit, and internal defect of the material under test will cause abnormal measuring readings.

Utilization and Selection of a Coupling Gel (R7950)

Coupling gel is used for transmitting high-frequency energy between the ultrasonic gel and the material under test. If the type of gel or utilization is wrong, or the utilization it will cause an error. For most applications a single droplet of coupling gel coated evenly is sufficient. When measuring a smooth surface use a gel with low viscosity (such as the coupling gel provided or light engine oil). When measuring a coarse object surface, vertical surface or top surface, use a gel with high viscosity (such as glycerin grease, consistent grease, and lubricating grease, etc.)

Product Care

To keep your instrument in good working order we recommend the following:

- Store your product in a clean, dry place.
- Change the battery as needed.
- If your instrument isn't being used for a period of one month or longer please remove the battery.
- Clean your product and accessories with biodegradable cleaner. Do not spray the cleaner directly on the instrument. Use on external parts only.

Product Warranty

REED Instruments guarantees this instrument to be free of defects in material or workmanship for a period of one (1) year from date of shipment. During the warranty period, REED Instruments will repair or replace, at no charge, products or parts of a product that proves to be defective because of improper material or workmanship, under normal use and maintenance. REED Instruments total liability is limited to repair or replacement of the product. REED Instruments shall not be liable for damages to goods, property, or persons due to improper use or through attempts to utilize the instrument under conditions which exceed the designed capabilities. In order to begin the warranty service process, please contact us by email at 1-877-849-2127 or info@reedinstruments.com to discuss the claim and determine the appropriate steps to process the warranty.

Product Disposal and Recycling



Please follow local laws and regulations when disposing or recycling your instrument. Your product contains electronic components and must be disposed of separately from standard waste products.

Product Support

If you have any questions on your product, please contact your authorized REED distributor or REED Instruments Customer Service by phone at 1-877-849-2127 or by email at info@reedinstruments.com.

Please visit **www.REEDInstruments.com** for the most up-to-date manuals, datasheets, product guides and software.

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