

EVOTIS

DIGITAL ELECTRONIC TAPPING EXFOLIATION DETECTOR

OPERATION MANUAL



NDT Supply.com, Inc.

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Introduction

EVOTIS is designed to detect defects and quantitatively measure damage of composite structured materials. In order to fully realize its performance capabilities, please read this operation manual carefully.

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual may impair the protections provided by the equipment. Sysmic Co., Ltd. assumes no liability for the customer's failure to comply with these requirements.

- **Do Not Operate in an Explosive Atmosphere**

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

- **Keep Away from Live Circuits**

Operation personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect the power and discharge circuits before touching them.

- **Do Not Substitute Parts or Modify the Instrument**

To avoid the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification of the instrument. Return the instrument to the exporter for service and repair to ensure that safety features are maintained.

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The EVOTIS Package Contains the Following Items:

| Description | Quantity |
|---|----------|
| Main Unit (Fig. 1) | 1 |
| Auto Hammer (with connector cable) (Fig. 2) | 1 |
| AC Adapter (Fig. 3) | 1 |
| Dedicated USB Cable (Fig. 4) | 1 |
| Communication Software (CD-ROM) (Fig. 5) | 1 |
| AA Rechargeable NiMH Batteries (Fig. 6) | 4 |
| Battery Charger (Fig. 6) | 1 |
| Operation Manual (this document) | 1 |



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

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Features

EVOTIS is designed to detect defects and quantitatively measure damage of composite structured materials.

EVOTIS adopts the impact acoustic method using auto hammer, collecting and analyzing sounds to detect defects such as disbonds and hollows in testing subjects.

Test results will be notified to the operator in the following manner:

1. When EVOTIS is in use, it displays both a standard value and a measured value corrected from an auto hammer at each stroke. A comparison of the standard and measured values are shown in four levels by three color LED lights and a buzzer sound at the designated ratio.
2. A half-wave length of the very first sound wave is collected from the hammer as a measured value and is displayed as a three-digit numerical value in units of 1 micro-second (Patent #3922459).

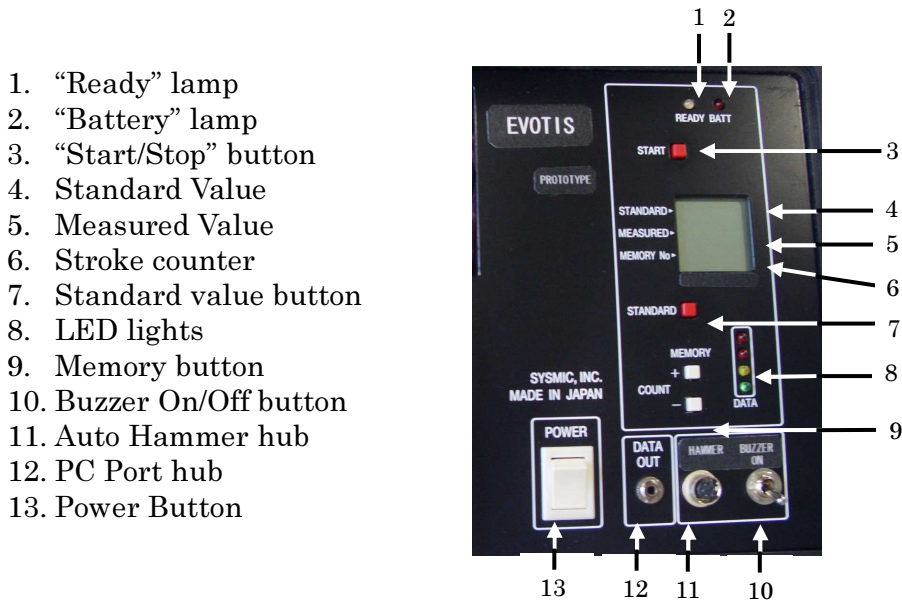
Measured values up to 7,700 strokes can be saved in the EVOTIS. By connecting the EVOTIS with a computer using a dedicated USB cable while the EVOTIS is in use, measured values can be transferred to the computer in real time. Also, measured values saved in the EVOTIS can be transferred to a computer after testing is completed. In order to transfer measured values to a computer, the dedicated software included in the package is required.

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Using the EVOTIS

1. Connect Auto Hammer with the main unit by connecting the hammer's connector cable to the Auto Hammer hub.
2. Switch on the power button to turn on the unit.
3. Obtain a standard value by pressing the Standard Value button while placing the Auto Hammer's head to the surface of the good portion of the testing subject in the right angle. The hammer automatically hits the surface of the testing subject four times. EVOTIS takes the average measure of two values, excluding the highest and lowest values, and uses this as the standard value. This standard value is shown on the unit's display. Once a standard value is obtained, the Ready lamp will light up.
4. Press the Start/Stop button to start measuring the testing subject. Press the Start/Stop button to stop operation. (Pressing the Start/Stop button with a longer stroke allows continuous measuring of the testing subject.)
5. EVOTIS compares each measured value with the standard value. Differences are displayed by colored LED lights at the ratio below:

| | |
|---------------|----------------|
| Green | 0% – 15% |
| Yellow | 16% – 39% |
| Red 1 | 40% – 79% |
| Red 2 | 80% – 119% |
| Red 1 & Red 2 | More than 120% |

- Buzzer sound will accompany red color LED lights.
 - Buzzer sound can be turned on and off by operator with Buzzer On/Off button at the console.
6. Recorded measured values can be seen by pressing the “+” and/or “-” Memory button.

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Specifications

<Main Unit>

Configuration (W x D x H): 230mm x 170mm x 100mm
Power: Four NiMH AA rechargeable batteries (battery charger included) or four alkaline AA batteries
Weight: 1,550g (excluding batteries)
Measuring: From 020 to 999 micro-second with data analyzing capacity of 0.2 micro-second
It displays and records measured value with rounded off decimal point
A measured value will be converted to an electronic synthetic sound at below frequencies:
020 μ s: 6.25 kHz (Highest)
050 μ s: 2.50 kHz
100 μ s: 1.25 kHz
200 μ s: 625 Hz
500 μ s: 250 Hz
999 μ s: 125 Hz (Lowest)

<Auto Hammer>

Configuration: Square pole with the sides of 20mm and a height of 90mm (excluding protrusion)
Sound collecting method: Condenser microphone (waterproofed)
Tapping: Stainless steel hammer with a diameter of 10mm, powered by solenoid
Tapping stroke length: 4mm
Tapping wavelength: 2Hz (fixed)
Cable: 2m
Weight: 250g (excluding cable)

<AC Adopter>

Output: DC5V 2A

<USB Cable>

Dedicated USB cable to connect EVOTIS to a computer

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Safety Information

1. Follow the battery installation instructions carefully and make sure the plus and minus poles face the right directions. Use AA Rechargeable NiMH batteries (in the package). Replace with new batteries when the Battery lamp turns red.

Stored measured values are kept in memory when the power is turned off. However, stored measured values will be lost if the battery power runs out.

2. To avoid misreading test results, the standard value must be reset each time a different material and/or difference in surface thickness is being tested.
3. To avoid misreading test results, the surface of the testing subject must be cleaned before operation.
4. Remove batteries if the EVOTIS is not in use for an extended period.

Care and Cleaning

Clean the surface of the case with an alcohol-based substance. Do NOT use any other solvents, including, but not limited to:

- Alkali or alkaline salt solvents
- Amines
- Ketones (acetone methyl-ethyl-ketone)
- Aromatic hydrocarbons (benzene, toluene, xylene)
- Esters
- Halogen-based solvents (carbon tetrachloride trichloroethylene, dioxane, methylene-chloride, chloroform)

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Warranty

The product described herein is warrantied against defects in material, design and workmanship for a period of one year from the date of shipment from Japan. Warranty does not apply to the consumable parts including batteries, charger, and hammer head of the Auto Hammer.

Subject to the conditions and limitations described below, this product, if returned to us with proof of purchase within the stated warranty period, and if covered under this warranty, will be repaired or replaced (with the same model, or one of equal value or specification) at our option.

This warranty is subject to the following conditions and limitations:

- A) This warranty will not apply to any product or part thereof that is worn or broken or that has become inoperative due to abuse, misuse, accidental damage, neglect or lack of proper installation, operation or maintenance (as outlined in the operating instructions).
- B) This warranty will not apply to normal wear and tear or to expendable parts or accessories that may be supplied with the product and that are expected to become inoperative or unusable after a reasonable period of use.
- C) This warranty will not apply where damage is caused by repairs made or attempted by others (i.e. persons not authorized by the manufacturer).
- D) This warranty will not apply to any product or part thereof if any part from another manufacturer is installed therein or any repairs or alterations have been made or attempted by unauthorized persons.
- E) This warranty will not apply to normal deterioration of the exterior finish, including but not limited to scratches, dents, chipped paint, or to any corrosion or discolouring caused by heat, abrasive and/or chemical cleaners;

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