USER GUIDE
SONIC SIFTER

The Sonic Sifter User Guide

Contents

Description

The Endecotts Sonic Sifter is a vibrating sifter employing an acoustic method to carry out sieve tests for particle size analysis of various material samples.

It is based on the principle of pulsating a column of **air** through a stack of sieves at a set frequency. This causes the particles of the sample material to vibrate and move around the mesh of the sieves in order to pass through the apertures. To assist in this movement of particles there is pulsator that periodically taps the base of the table to release blocked or blinded apertures with particles that are close to the aperture size. The Sonic Sifter incorporates a horizontal pulse which provides an electromechanical shock wave horizontally. This assists in sifting samples that are 45μm and finer where agglomeration occurs due to electrostatic charges.

The Sonic Sifter has an amplitude control to vary the vibration amplitude. It also has a digital timer than can be programmed for process time. It switches of automatically at the end.

Setting Up
Unpacking

The Sonic Sifter should be set up according to the following procedure and the diagram on Page 3:

Carefully remove the Sonic Sifter from carton, remove the internal packing material and check the contents as follows:

1 off   Endecotts Sonic Sifter
1 off   Mains Cable
1 off   Stack Assembly Comprising:-
       - 1 off   Column Lock
       - 6 off   Spacers, Standard
       - 1 off   Fines Collector
       - 1 off   Fines Collector Holder
       - 1 off   Diaphragm
       - 1 off   Top Cone
   - 1 off   Instruction Manual

The Sonic Sifter does not need any assembly apart from connecting the mains cable to the IEC connector at the rear of the instrument. Assembly of the sieve stack is described in Sieve Stack Assembly.

Setting Up
Assembly & Operating Conditions

Operating Conditions

The Sonic Sifter will function correctly at any non-condensing humidity level within the temperature limits of -18ºCto+49º (OºF to + 120ºF). However, for best results, it   is recommended that the ambient temperature and humidity be controlled. Sieves should never be subjected to temperatures above +49ºC (+ 120ºF) or below -43ºC (-45ºF). External vibrations of low amplitude will have little effect on the accuracy of the results. To ensure that optimum results are achieved the instrument should be placed on a level surface. This will help ensure an even layer of particles on each sieve.
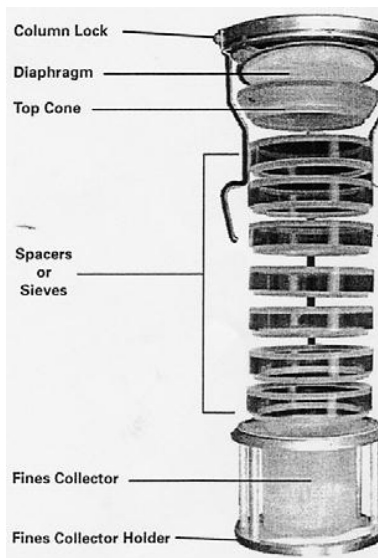
Setting Up
Electrical Connections

Electrical Connections ensure that the voltage and frequency on the Rating Label and switchable fused IEC inlet at the rear of the Sonic Sifter correspond with the local electrical mains supply. If there is any discrepancy please consult your supplier or a qualified electrician.

Do Not Connect to any supply other than that stated on the nameplate

Important – This equipment must be connected to mains earth

The Endecotts Sonic Sifter is provided with a detachable 2 metre long mains cable with an IEC moulded connector at the shaker end. Certain models may be supplied with a fused plug. In the event of failure the fuse must be replaced with a fuse of identical rating.

**IF THERE IS ANY DOUBT CONSULT
A QUALIFIED ELECTRICIAN**

Setting Up
Sieve Stacking

The Sonic Sifter accommodates upto:

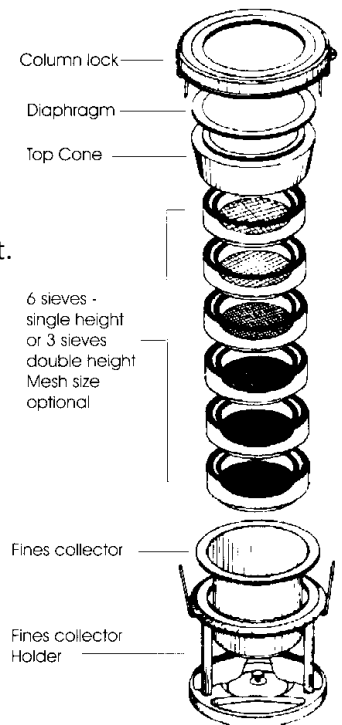6 Standard Sieves or

1 Precision Sieve

+ 4 Standard sieves.

Any combination of Standard and Precision Sieves can be used in one stack provided that the stack height is equivalent to the height of 6 Standard Sieves. When a sieve stack is smaller in height, the discrepancy can be made up with spacers. Extra Spacers may be purchased separately.

1. Assemble the sieve stack with the coarsest sieve at the top and the finest at the bottom from the sieves that are selected for the test to be carried out. Generally any spacers used are placed at the top of the stack.

2. Install the Fines Collector in the Fines Collector Holder.

3. Fasten the round metal plate at the bottom of the Fines Collector to the Fines Collector Holder. This is done by sliding the keyhole slot in the Fines Collector over the fastener mounted in the Fines Collector Holder base.

Column lock
Diaphragm
Top Cone

6 sieves -
single height
or 3 sieves
double height
Mesh size
optional

Fines collector

Fines collector
Holder

Setting Up (cont)
Sieve Stacking

4. Place the sieve stack in the Fines Collector Holder with the Fines Collector in position.

5. Place the Top Cone on the top sieve or spacer if it is used.

6. Sample material for test is then placed in the top sieve.

7. Position the Diaphragm with the metallic ring downwards on the top one.

8. Place the Column Lock onto the sieve stack and press own until the latch bars lock onto the Fines Collector Holder. The sieve stack is ready for placing in the sift chamber.

9. Insert the sieve stack assembly into the chamber until it rests against the stops on the base of the sieving chamber. Release the sieve stack locking bars by inserting a thumb and forefinger inside the bars at the bottom of the stack and forcing them outwards.

10. When released the spring loaded ring on the top of the frame will rise upward and the column lock will fit into stack locking recess in the top of the sieving chamber, which will secure the stack in place.

11. Check the stack assembly is secured by gently pulling outwards. When the stack is properly secured, the stack switch is depressed and will allow normal operations. If not secured, the sifter will not operate.

Setting Up (cont)
Sieve Stacking

13.Disassembling the sieve stack is done by sliding the thumb and forefinger into the openings between the lowest sieve or spacer and the column locking arms. While steadying the stack with the other hand, spread the column locking arms. The spring loaded column lock will release. Remove the column lock carefully and access can be gained to the rest of the stacking components.

14.Test times vary with size, density, texture, and quantity of samples. Five minutes is typical, but sieving time can be as little as 30 seconds under favorable conditions. When using woven wire sieves, maximum sample quantities are 10g or 4cc for samples smaller than 38μm, and 20g or 7cc for larger particle samples. A one gram sample is typical for precision sieving with electroformed sieves.

Operating Instructions
Position and Function of Controls

ON /OFF
Power Switch

Operating Mode
Indicator Lights

Programmable
Control Keypad

Tapping Action
Control Buttons

Test Phase
Diagram &
Indicator Lights

LED Digital
Display

<u>Operating Instructions</u>
Settings and Functions

The 16-button keypad used for digital entries of amplitude and times is also used to activate the following functions:

Run / Stop
The Run/Stop function starts and halts the sieving action. The LED light is on when the Sonic Sifter is running. The digital display counts down from the total test time to automatically stop when the counter reaches zero. The program sequence LEDs indicates which phase is active.

Pause / Resume
The Pause/Resume function interrupts the progress of a sieving sequence. The Pause LED light is lit when this function is activated. Tim remaining and the position in the A, B, C sequence are indicated on the display and program LEDs. Press the Pause button a second time to resume operation.

Program
Amplitude and Phase times are programmed in order by entering each via the keypad. The Program button is used to advance to the next entry or is used without entries to review an existing program from the memory.

Memory
The Memory function is used to store and retrieve programmed sequence from 10 memory locations coded from 0 to 9. Buttons to Save and Recall the programmed sieving sequences are activated when operating in the Memory Mode.

Operating Instructions
Testing Sequences

Establish the maximum amplitude for the test. Set the Sonic Sifter in Manual Mode, vary the amplitude and determine visually the intensity of oscillation needed to move the largest particles on the largest size sieve. Note the amplitude value of this point on the 0-99 scale on the Sonic Sifter's display.

The stepwise test sequence is illustrated on the Sonic Sifter control panel marked by red signal lights. In Program Mode the maximum amplitude, as determined above, is entered via the keypad. Three Phase times and Amplitude are entered in sequence.

Time A is the duration needed for pulsing to build from zero to maximum amplitude During this phase, small particles are gently separated from larger ones and roughly sorted in the sieve stack. This avoids initial exposure to more severe agitation which often creates electrostatic attraction of fines to larger particles and hinder proper separation.

Time B runs constantly at maximum amplitude. Most of the test time occurs in this phase.

Time C is the duration needed for the pulse amplitude to decline from the maximum to zero. Each sieve size has optimum separation amplitude that decreases with particle size. The gradual decrease at the end of the test serves to clean up separation of near-sized particles on each sieve.

> **Note: Total test times (A+B+C). i.e.9.9 + 99.9 +9.9 up to 119 minutes may be programmed.**

<u>Operating Instructions</u>
Adjusting Pulse Amplitude & Tappers

Adjusting Pulse Amplitude & Tappers Load a sample typical of the given type into the sieves to be used with that sample and place them in the Sonic Sifter.

When the On button is engaged, the unit will be in the Automatic mode. To determine the proper vibratory level and duration for separating a given sample type, switch the unit to Manual mode. When the Manual mode indicator light is on, the amplitude value of pulsing (the power level) must be entered. Generally, start by setting the value at some low value such as five (5).

To select tappers press arrow keys in the lower left of key pad. The vertical arrow key activates the vertical tapper located in the bottom plate. The combined horizontal/vertical arrow key turns on both horizontal and vertical tappers. (Note: Horizontal tappers cannot be enabled separately).

Press the Run/Stop key. The maximum amplitude indicator light will light, and the power level can be adjusted upward or downward as indicated by the up and down arrows on the Record (REC) and Save (SAVE) buttons.

Adjust the amplitude until the sample on the top sieve flows smoothly in a gentle fluid action. Note the final value on   the LED readout for later programming. This maximum amplitude value should be determined for every sample type, or for similar sample types with variations in particle topsize.

<u>Operating Instructions</u>
Programming-Saving-Recalling-Running

After you determine the proper amplitude (power level) for sieving a sample, press the Manual/Auto key and return the unit to automatic operation. The timing is programmed in $1/10^{th}$ of a minute interval. The power level (amplitude) is from 0 to 99% of power.

1) Press the Program key (PGM) until the Time A indicator light starts to blink. Then enter the duration using the numbered keypad for the power level to rise from 0 to the maximum power for the run. A minimum default value of 0.1 minutes (6 seconds) is pre-established. The TIME A, or ramp-up time, is critical with samples containing large amounts of fines and/or samples of low specific gravity or with tendencies to acquire electrostatic charge. Gradual power build up allows such particles to gently separate before the more severe action causes electrostatic charges to agglomerate the particles. Experimentation may be necessary to determine whether extended ramp-up times should be used with each sample type.

2)Press the program key until the maximum amplitude light starts blinking, then enter the percentage of power needed to sift the particles as determined in Manual mode during Setup Adjustment.

3) Press the Program key again and the TIME B indicator light will start blinking. Enter the time of the main test duration to be run at constant maximum amplitude.

Operating Instructions

1) Press the Program key again, and the TIME C indicator light will blink. Enter the desired time for the power to ramp down to 0 value.
2) Press the Program key once more. The total time set for the test (the value of A+B+C times) will appear.
3) Select tappers as previously advised (see Page 10), these settings will be stored with the program.
4) If the program is to be stored for future re-execution, press the Save key, and enter a number from 0 to 9 as the program's identifying code. Up to ten programs may be stored in memory for later retrieval by assigned code number.
5) To operate with a stored program, press the RECALL button, enter the program's code number, then press the RUN key.
6) After completing the test, press down on the sieve stack locking bar brace until the bars latch onto the fines collector holder.
7) Remove the stack assembly and weigh the sieves with the separated material on them.
8) Subtract the tare weight of the sieve from the loaded sieve weight to obtain the weight of the separated portion of the test sample.

The following added technique yields an accurate weight without any loss of test sample from handling and cleaning of the sieves. Weigh the fines on the tared fines collector, the top diaphragm, the top cone and the spacers. Subtract the tare of each part of the stack assembly to obtain the total weight of the fines.

Note: Balance should be accurate to .01 grams

Maintenance

The Endecott's Sonic Sifter and accessories will perform satisfactorily if the following basic instructions for care are observed:

Cleaning
The Sonic Sifter cabinet, Sift Chamber and aluminum components may be wiped clean periodically with a soft damp cloth.

<div style="background:grey">

Do not use any solvents for cleaning or harsh detergents

</div>

Care of Sieves
1) For best results, sieves should be cleaned in an ultrasonic cleaner of 150 watts or less. General cleaning is accomplished in a mild detergent. The solution must be maintained at a temperature of 24ºC to 27ºC (75ºF to 85ºF). If an ultrasonic cleaner is not available, immerse the items to be cleaned in the same mild solution. After washing, rinse the parts with water, and allow the parts to air dry.
2) Precision and Finer (150 microns or less) mesh sieves especially should be treated carefully as these are very fragile. Please observe the following when using or cleaning these sieves.
3) Store all sieves in the protective containers supplied after cleaning.

Important

Care of precision and finer sieves

Do not expose the sieves, spacers or top cone to heat sources

Do not brush or use sharp objects to remove particles in the mesh

**Do not use compressed air to clean or
remove particles in the mesh**

General Advice

Endecotts shakers are fully tested and factory checked before shipping to customers. No parts require lubrication or resetting unless disturbed.

The machine has been constructed and factory tested to ensure correct operation when connected to the specified electricity supply indicated on the machines rating plate.

Use of unapproved spares or any alteration to the machine would invalidate all warranties and compliance with European directives for 'CE'Marking.

> *Endecotts Ltd does not accept any*
> *responsibility if the operating*
> *instructions contained in this*
> *manual are not strictly followed.*

CE

The Sonic Sifter is fully EMC and LVD
compliant and complies with all relevant
European directives

Specification

Model:	Sonic Sifter
Voltage:	115 Volts or 230 Volts (selectable)
Frequency:	60 Hz or 50 Hz
Phase:	Single
Power Consumption:	90 VA 90 VA Class:
	1 (earthed)
Vibrations Speed:	3,000 per minute at 50 & 60Hz
Tapping:	A. No tapping
	B. Vertical only. 30/min
	C. Vertical and horizontal, alternating 60/min
Process Time:	0 – 119 minutes
Incremental	0.1 minutes (in 6 second increments)
Time Ranges	9.9 + 99.9 + 9.9
Clock:	24 Hour (hours and minutes)
Operating Temp:	-18ºC to 49ºC
Humidity:	90 % Non Condensing
Dimensions:	508mm Height x 254mm Width x 254mm Deep
Weight:	16.8 kg

Endecotts policy is one of continuous development and we reserve
the right to modify future

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