Impact Test Equipment Ltd.
Building 21 Stevenston Ind. Est.
Stevenston
Ayrshire
KA20 3LR

T: 01294 602626
F: 01294 461168

E: sales@impact-test.co.uk

Test Equipment Web Site
www.impact-test.co.uk

Test Sieves & Accessories Web Site
www.impact-test.com
1.1 GENERAL FEATURES

- This manual is addressed to the carrier, the installer, the user, the maintenance operator, the scrapping operator.

- Please read it carefully because it informs you about the operating of the instrument in safety conditions.

- This manual has to be considered a part of the product and concerns only the appliance it is delivered with.

- Keep the manual in order during the whole life of the appliance to consult it for any needs.

- In case of sale, the manual and its enclosures should be given together with the instrument.

- The manufacturer assumes no liability for any damages caused by a misuse of the instrument.

- The manufacturer has the right to modify this technical literature as well as the appliance this refers to without any previous notice.
1.2 UNPACKING
After removing the package, check that any parts of the instrument are not damaged. In case of doubt, DO NOT USE THE APPLIANCE and ask the manufacturer.
DANGER: The materials used for the package (plastic, polystyrene, screws, nails, wood etc.) have to be kept far from children. They must be thrown away in a proper collection centre.

1.3 USE DESTINATION
The test hammer is an instrument projected for non-destructive tests on concrete works. It allows to find out the estimated resistance of concrete.
It is extremely easy to use and handy, so that it can execute tests in a very short time and on any part of the specimen; it is also possible to control the specimen features in the time without deterioration.
Furthermore the quality of manufacturing allows to obtain reliable results.
The equipment is made for the aim which it has been conceived for.
Any other uses are not allowed.

1.4 STRUCTURE AND OPERATING OF THE APPLIANCE
A beating mass (9) which is sliding on a guiding rod (13) receive a potential energy from the torsion of a calibrated spring (7).
The beating mass, hitting the impact plunger (1) placed on the specimen to test, rebounds proportionally to the specimen resistance.
An indicator (12) is taken along a graduated scale by the rebound movement, giving in this way a rebound value "B" which allows (through special curves on graphics) to determine the estimated resistance of the concrete.

1.5 MODELS
Available models of rebound hammers which the manual is referring to:
- "Classic concrete hammer" model
It is usually used for tests on concrete, and it has a percussion energy of 2,207 Nm (0,225 Kgm).
- "Rocks" model
It is usually used on rocks core specimens or on small parts of rocks that can be sensitive by the percussion of the beating mass of the Classic Model.
The percussion energy is 0,735 Nm (0,075 Kgm).
"Rocks" model is easily recognized by the coloured cap (5) usually black.
2.1 GENERAL SAFETY STANDARDS

- The use, lifting, installation, maintenance and scrapping of the appliance is allowed only to qualified staff. A qualified staff is composed by people who are authorised by the safety responsible to do any activities due to their experience and acknowledgement of the operating of the machine and of the standards, rules and actions. The manufacturers offers training and assumes no liability for any damages due to a misuse of the machine by an unskilled staff.

- The manufacturer recommends to follow carefully the instructions and procedures of the operating manual and the safety standards concerning the safety devices and the general rules of the work environment.

- The operating manual must be carefully read by the safety responsible, by the operators and maintenance engineers. It must always be kept near the machine in order to be able to read it any times it will be necessary.

- Any tampering or modifications of the machine (electric, mechanical etc.) that are not allowed by a written agreement of the manufacturer must be considered as not permitted and the manufacturer will not accept to be charged for any damages.

The manufacturer assumes no liability for any damages to people, things and animals caused by the non compliance of the above instructions.

2.2 SAFETY SYSTEMS
During the test execution we recommend the use of protection glasses.

2.3 DANGEROUS PARTS AND RESIDUAL RISKS

DANGER
Do not execute tests neither on the human body nor on animals.
The use of this device on human body could cause serious damages.
3.1 PREPARATION OF THE DEVICE

Take the test hammer out of its box.
Lay the instrument on a solid surface, so that the hemispheric part of the impact plunger comes in touch with the surface.
Holding tight the body of the instrument, push it against the surface until you hear the release of the internal stopping device.
Take the instrument away from the surface so that the impact plunger (1) comes completely out of the body.
BEWARE: The obliquity of the impact plunger (1) towards the longitudinal axis of the instrument has to be considered normal and correct!

At this moment the instrument is ready for the test execution.

3.2 SURFACE PREPARATION

Execute the test on the concrete heart, taking away any trace of plaster or covering.
Eliminate carefully plasters, paintings or irregularity on the surface by using the abrasive stone (delivered with the instrument).
If necessary you can also use an electric sanding-machine.

3.3 TEST EXECUTION

Lay the instrument on the surface of the material to be tested so that the hemispheric part of the impact plunger (1) comes in touch with the surface itself.
Verify that the instrument is perfectly perpendicular to the surface.
Hold the body of the instrument and push it slowly and gradually against the manufacture until you hear the test stroke.

By keeping the instrument pushed against the surface, push the button (14) without releasing, then take the instrument away from the surface (the impact plunger remains inside the instrument).
Release the button (14).
In this condition the indicator (12) will show on the graduated scale (10) the rebound value “B” obtained during the test.

ATTENTION: During the execution of the stroke do not push the button (14).

To prepare the instrument for a new test, repeat the procedure described in 3.1

3.4 RESULTS INTERPRETATION!

The curves of the diagram placed on the instrument (described also in this operating manual) allow to obtain the compression values on cubes. These ones are calculated on the basis of the rebound value “B” coming out from the tests executed by the hammer.
Any value written on the diagram curves is an average of the rebound values obtained by a min. of 5-10 tests.
For the average calculation, do not use values which have a 5 units gap (or more) from the average itself.
On the diagrams 3 curves are present. These allow the conversion in relation with the position of the instrument towards the horizontal line.
Sometimes it is necessary to adjust the rebound value obtained during a test. This happens when the position of the instrument is different from one of the three foreseen by the diagram curves. (This is generally caused by the necessity to keep the instrument axis perpendicular to the manufacture surface during the test).
When this happens please adjust the rebound value according to this scheme:
We have executed a lot of tests with the hammer on a series of cubic specimens. The very same cubic specimens have also been tested by using a compression machine. The curves on the diagrams are the result of the comparison between the two groups of values. The specimens employed for the tests have been made using concrete formed by: sand, gravel and Portland cement, ageing from 14 and 56 days. Specimens made with different materials (which are not the ones traditionally used for the concrete preparation) have had compression values strongly different from the ones obtained by testing the specimens described here upper. Therefore since the concrete composition seriously affects the values obtained with the hammer tests, please carefully verify the results obtained on:

- Concrete made with a non conventional mixture or containing aggregates with low resistance or clayey.
- Concrete with a particularly low resistance
- Concrete obtained without a proper mixture or compacting, so that there are gravel nests inside the manufacture.
- Concrete which are not dried enough.
- Concrete made with aggregates with a surface extremely smooth or glossy.
- Concrete which are particularly old.

In case of unclear results we recommend you to prepare some cubic specimens and to test them with a compression machine.

3.4 ADVISES

In order to have reliable results, we recommend you to avoid the tests in some particular cases like for example:

- Casting or covering connections, on porous or non uniform areas, on gravel nest or on any other part of the manufacture which is not representative.
- Thin elements (thickness lower than 12 cm), their elasticity could influence the test results.
- Manufacture made with low quality concrete.

ATTENTION: Before putting the abrasive stone in the instrument box, make sure you have close it in its case. Otherwise it can be difficult or impossible take off the abrasive stone from the box.
4.1 ROUTINE MAINTENANCE

The instrument doesn't need particular cares. Just keep the impact plunger perfectly cleaned in order to avoid that dust or dirty could get inside the instrument.

4.2 CALIBRATION

We recommend a periodical control of the calibration by means of the special anvil for calibration.

4.3 SPECIAL MAINTENANCE

In case of special maintenance operations (repairs, replacement of parts and any other operation not described in this manual) ask directly to the manufacturer.