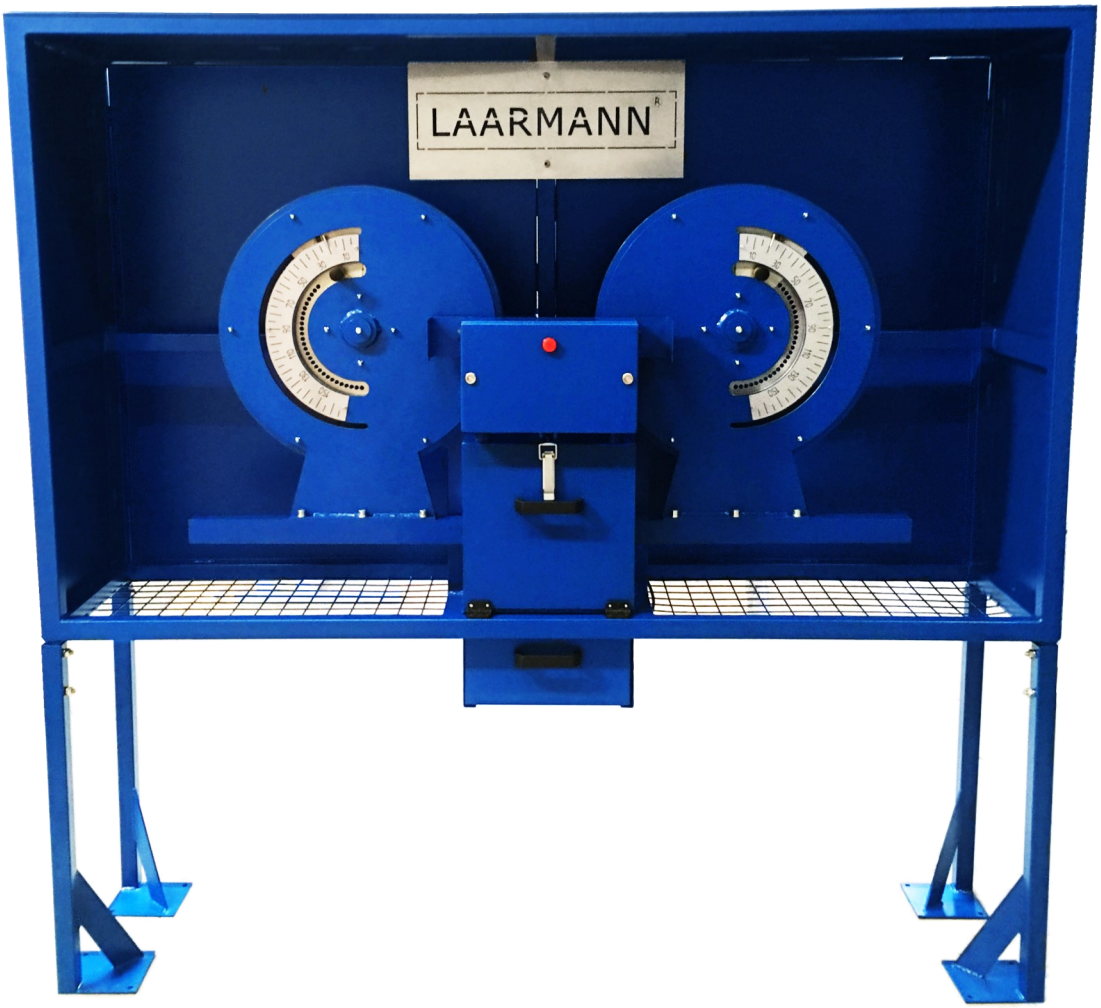
LAARMANN®

Innovators in Solids



IMPACT TESTER
USER MANUAL

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1 Safety Information

Before using the machine, make sure to read and understand this manual thoroughly. Keep the manual close to the machine, easily accessible to all the users. Improper operation can cause injury to persons or damage to the equipment.

The impact tester is designed to be operated by one individual operator. Loosing electricity will shut down the magnets and impact hammers will drop when strained.

1.1 Warning symbols

This symbol indicates a potential risk and alerts you to proceed with caution.

This symbol indicates the presence of high voltage and warns the user to proceed with caution.

This symbol indicates risks associated with hot surfaces.

1.2 Safety instuctions

Safety instructions

Claims for damages in any form whatsoever, for injury to persons or damage to the machine, caused through non-observance of the following safety instructions, are excluded.

Use according to the intended purpose

Do not make any alterations to the machine and use only approved spare parts and accessories. Otherwise the Declaration of Conformity will lose its validity and this will also lead to the loss of any guarantee claims.

Transport

Do not knock, shake or throw the Impact Tester during transport. Otherwise the electronic and mechanical components may be damaged.

Packing material

Please keep the packing material for the duration of the guarantee period. In case of a complaint and return of the machine in unsuitable packing material, your guarantee claim will be lost.

Temperature variations

If the Impact Tester is subjected to high temperature variations, protect it against condensed water. Otherwise the electronic components may be damaged.

Ambient temperature
If the temperature drops below +5°C or exceeds +40°C, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

Inserting the milling cups
Ensure that the milling cups are inserted correctly in the milling cup holder. Otherwise they can be damaged, when starting the machine. Both milling positions must always be used. Otherwise this will cause considerable unbalance.

Removing and opening hot milling cups
When removing and opening hot milling cups, always wear protective gloves. There is a danger of burning the hands.

Materials
Observe the relevant regulations and directives for handling chemicals and hazardous materials. Milling of materials, which give a risk of fire or explosion, is prohibited.

Electrical connection
If the values for the mains power supply on the name plate are not observed, the electrical and mechanical components may be damaged.

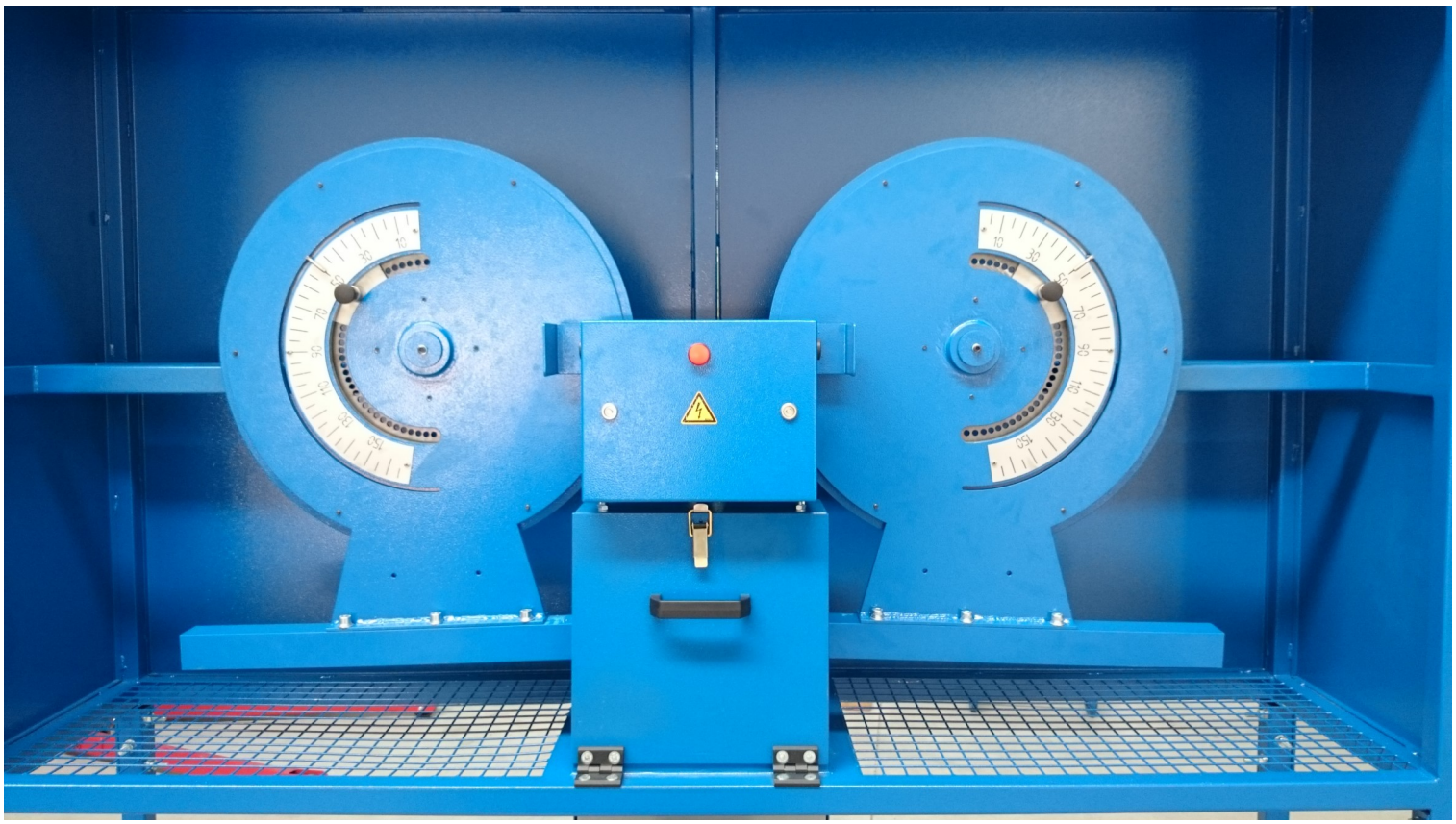
Cleaning
Do not clean the Impact Tester under running water. Danger to life through electric shock. Use only a soft cloth moistened with water. Cleaning agents and solvents should not be used, not for cleaning the milling tools either.

Repair
For your own safety, repairs must be carried out only by authorized service technicians.

2 Description

The IMPACT TESTER is a laboratory test machine, which is suitable to determine the crushability test that was developed by F.C. Bond.

- The Impact Tester consists of two pendulum-mounted hammers, each weighing approximately 30 lb, and mounted to simultaneously strike equal blows on opposite sides of each rock specimen.
- The crushability test is to be performed on ten or more representative pieces of broken stone. Each is to pass a 3-in. square opening and be retained on a 2-in. square opening. More specimens will increase the reliability of the test results.



3 Technical features

3.1 Construction

The housing of IMPACT TESTER is made of steel plate varnished with powder coating 5005. Behind the two hammers are electro magnets. The magnets hold the hammers in place, until the operator pushes and holds both buttons on the same time. WARNING if the electricity fails or is turned off from the machine the magnets will lose their function.

Protective equipment: Wear gloves and safety glasses for protection.

The Crushing chamber of the IMPACT TESTER is protected by a metal front door with locking clip.

The Crushing test should be only performed when the metal door is closed and the locking clip is in the locking position. The warning light will burn continually to indicate if the metal door is open. When the warning light is on the test cannot be performed.

3.2 Technical Data

Demension wxhxd	2000 x 2180 x 420 mm
Weight	260kg
Working principle	Crushing by impact of two hammers
Feed size maximum	76mm
Test repetition	At least 10, preferably 20 test runs per sample

4 Installation

4.1 Unpacking

Before the installation, carefully examine the delivery for possible damage or missing parts. Open the box and take the machine out of the box. Check that the machine has not been visibly damaged during the transport.

Please keep the packing material for the duration of the guarantee period. In case of a complaint and return of the machine in unsuitable packing material, your guarantee claim will be lost.

If any kind of damage occurred during transport, immediately make a complaint to the carrier. Any incorrect delivery or missing parts should be reported to the distributor.

4.2 Selecting the right place

When selecting the right place for the machine, please consider the following:

- Assemble the legs delivered with the machine with the top 2 bolts. For detailed explanation see next page.
- Put the device on smooth, stable and level concrete floor.
- Leave enough space beyond the device.
- Leave enough space around the device, that you will easy control and maintain it.
- Don’t use the device in surroundings, where there are fast temperature and humidity changes. Also avoid places exposed to direct sunlight and places nearby heating devices.
- Avoid places, where the possibility of shocks and vibrations exists.
- Bolt the Impact Tester securely to a floor that can safely support the weight of the mill using anchors.
- Place the machine within 1.5 meters of an electricity socket.

4.2 Environment condition

The machine has been built for operating in process and laboratory environment. Therefore the environmental conditions should be the following:

- Temperature from 5°C to 40°C
- Humidity up to 85% RH, non-condensing

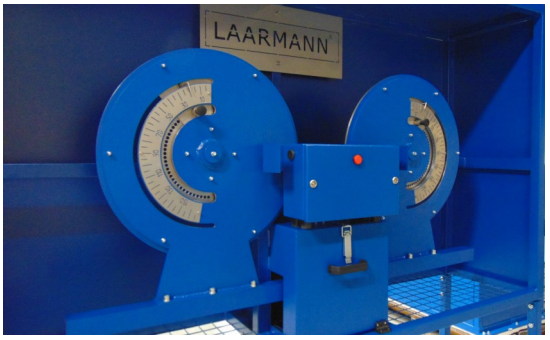
For assembly unscrew the top 2 bolts, put them under the legs of the machine and fasten them. Never unscrew the 3 bolt, this will cause the legs to come lose and a hazardous situation occurs.

5 Instructions for use

The on/off switch from the Impact tester is placed on the back of the control box. Start using the machine by switching the machine in to operation mode. When the machine is not in use release the hammers and turn the machine off. Never leave the machine unattended with the hammers locked to the magnets.

5.1 Placing the sample (specimen) on the proper position

Open the metal door. You will see the red light turns continually on. This means the door is not shut properly and therefore the magnets will not release but they will hold the hammers.



⚠ WARNING Always place the sample before lifting the hammers in place.

Place the sample to be crushed on the crushing platform. Make sure that the correct size sample is placed on the platform between the two hammers. A piece of modeling clay makes the mounting of the specimen easier so that it will not fall. The specimen should be mounted so that its smallest dimension is between the two hammers.

5.2 Adjusting the crushing angle and starting the test procedure

Close the door to the test chamber ensuring that it is fully closed and locked, the light should go off. To set the chosen angel for the hammers, pull the top of the locking bolt and adjust the slider to the desired angel, release the bolt and ensure that it firmly seats in place. This is dependent on which step you are in the process. The angle is adjustable by steps of 5 degrees.

⚠ **WARNING:** Both hammers must set to the same amount of degrees otherwise one hammer will hit the sample before the other.

Lift the hammers in place until you hear/notice the hammers are stuck to the magnets. Check again that both hammers are set to the correct height.

Place both hands on each side of the machine. You will find a small black button. By pressing and holding the buttons on the same time the red light will start blinking rapidly. When the light stops blinking the hammers will fall.

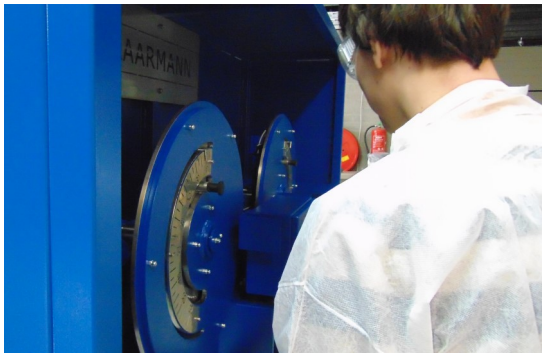
If the red light blinks slowly the buttons have not been activated on the same time and need to be released and pressed again.

Using the Impact Tester is a single man's job. Therefor the buttons should be pushed in with the right and left hand at the same time.

Test: At least 10 specimens preferably 20 specimens to be tested. Each broken stone has to pass a 3 inch square mesh and be retained on a 2 inch square mesh Determine the specific gravity of a representative sample of the specimens tested

5.3 Increasing the hammer angle

If still whole, check the mounting of the specimen and repeat steps 5.1 through 5.3, increasing hammer release angle by 5 deg each time until the specimen is broken. Note the last release angle used



6 Working Instructions

The on/off switch from the Impact tester is placed on the back of the control box. Start using the machine by switching the machine in to operation mode. When the machine is not in use release the hammers and turn the machine off. Never leave the machine unattended with the hammers locked to the magnets.

6.1 General

The IMPACT TESTER is a high performance product. It is used mainly in the in the mining sector and mineralogical or building applications etc

The milling process should only be started, when the front door is closed.

Do not open the front door during the crushing process.

Do not crush inflammable or explosive samples!

Note: Subject to technical modifications.

For further details and analysis of the test results refer to Bond F.C "Crushing Tests by Pressure and Impact, Trans AIME, Vol. 169, 1947, pp. 58-66"

Please note that the properties and therefore the dangerous nature of your sample can change during the milling process.

6.2 Maintenance

The IMPACT TESTER is maintenance free. When used properly, no maintenance and setting is necessary. Do not make any alterations to the machine and use only approved spare parts and accessories.

6.3 Cleaning

Use only a soft cloth moistened with water. Cleaning agents and solvents should not be used, not for cleaning the milling tools either.

LAARMANN

CE Declaration of Conformity

Product	Impact Tester
Power supply	220V/50/60Hz

This declaration of conformity confirms compliance of the above mentioned equipment to the relevant sections of the following European Directives:

91/368EWG	European machine guideline
73/23/EWG EC	Low Voltage Guidelines
EN 292, 294, 418	Safety guidelines
VBG 1,4,5 en 22	General electrical facitilies
89/336/EEC	Electromagnetic Compatibility Directive (EMC)
EN 5008-1-1992	Emissions
EN 50082-1-1992	Immunity
EN 60204-1 Part 1	Safety of Machinery – Electrical Equipment of Machines

WARNING:
This equipment is required to be operated strictly in accordance with the instructions given in the operating manual supplied with the product. All supply voltages and frequencies as stated on the rating plate must be used. External power cables and connectors must be supplied by LAARMANN. Any additional equipment used must be of a type approved by LAARMANN.

This conformity certificate will lose its validity in case of:

- Usage of unlicensed spares
- Usage of unlicensed accessories
- Any self made modifications of the machine

LAARMANN GROUP B.V. Roermond, April 2018