

LAARMANN®

Innovators in Solids

USER'S MANUAL

LAARMANN LMAJ200

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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.







1.1. WARNING SYMBOLS

The following are the warning symbols that are used in this manual.

	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 INSTRUCTIONS

	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 LMAJ200 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 LMAJ200 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.
	Atmospheric humidity If the humidity exceeds 85%, electronic and mechanical components can be damaged. Performance can be changed to an unknown extent.

	<p>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.</p>
	<p>Inserting grinding media Ensure that the grinding media are inserted correctly in the machine. Otherwise they can be damaged, when starting the machine</p>
	<p>Removing and opening hot grinding media When removing and opening hot grinding media, always wear protective gloves. There is a danger of burning the hands</p>
	<p>Materials Observe the relevant regulations and directives for handling chemicals and hazardous materials.</p>
	<p>Cleaning Do not clean the LMAJ200 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.</p>
	<p>Repair For your own safety, repairs must be carried out only by authorized service technicians.</p>

The use, transportation, installation, maintenance, demolition and disposal of the appliance are only permitted to “QUALIFIED PERSONNEL”.

This manual is exclusively aimed at “QUALIFIED PERSONNEL” and contains the necessary information for machine use.

”QUALIFIED PERSONNEL” means people who, due to their training, experience and education, as well as knowledge of the relevant standards, limitations and measures, have been authorised by the “PLANT SAFETY MANAGER” to carry out any necessary activity and are able to recognise and avoid any possible danger.

The manufacturer recommends that the instructions, procedures and recommendations in this manual and the work safety legislation in force be scrupulously adhered to, even with the use of appropriate protection devices (whether individual or part of the machine).

Knowledge and respect of the instructions, safety warnings and danger in this manual are all necessary for installation, operation, management and machine maintenance with a minimal risk.

The “PLANT SAFETY MANAGER” has the following responsibilities and duties:

- To know the machine functions, its commands, safety and protection devices, possible dangers of use and all the information in this manual in detail. This knowledge can only be gleaned from detailed reading of this manual.
- To know the safety legislation in force in detail in order to operate the machine
- To recognise the “QUALIFIED PERSONNEL” for transportation, handling, installation, use, maintenance, disposal, etc.
- Correctly train and educate the “QUALIFIED PERSONNEL” before allowing them access to the machine. The personnel must also be exhaustively trained with regards to the machine’s protection devices.

- Ensure the machine's safety devices are not tampered with or removed and are checked on a daily basis. Provide the operator appropriate individual protection devices according to the laws in force.
- The constructor is available for clarification, assistance and training and declines all responsibility for damage to things or people resulting from improper, incorrect and negligent use by untrained personnel.

Storage

The appliance must be stored and conserved in the original packaging and in a closed environment, protected from atmospheric agents with a minimum temperature of -15C°, and a maximum of +60C° and a maximum humidity of 70%.

Transportation

In order to avoid irreparable machine damage, move with care, do not overturn, protect from rain, do not stack, protect the packaging and its contents from bumps and sources of heat.

During transportation and movement it is important to avoid bumps, overloading with other packages, exposure to freezing or heating atmospheric agents, or any other potentially harmful condition to the device, things or people. Machine transportation and movement must be entrusted to Qualified Personnel who can ensure correct movement.

2. GENERAL DESCRIPTION

The LMAJ200 is a laboratory machine, which is suitable for pulverizing and homogenizing hard and brittle materials in the dry and wet state.

3. TECHNICAL FEATURES

3.1. CONSTRUCTION

The housing of LMAJ200 is made of steel plate with powder coated RAL5005 paint.

Protective equipment

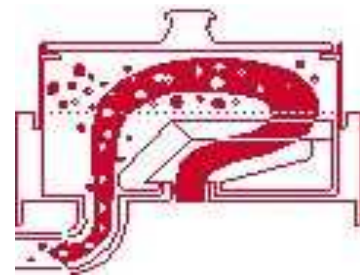
The air jet machine is used for sieving powder and dry grain products by obtaining sieving results between 5 to 4000 microns.

Its working foundation is based on the use of air that tug thin particles to make them go through the sieve.

This effect is made through a vacuum machine that provokes a controlled decrease of pressure.

STANDARD EQUIPMENT

- Sieve shaker
- Supplying cable
- Plexiglass cover
- Little plastic hammer
- Instructions manual
- Vacuum cleaner and connection pipe



3.2. TECHNICAL DATA

LID A1

It is used to seal the sieve **A2** and the material that have to be sieved during the test in order to avoid material's outflow.

SIEVE A2 (it's an accessory not supplied with the instrument).

GENERAL SWITCH A3

The switch enables or disables all the sieving-shaker functions, including the aspirator functioning.

Next to the general switch there is the supplying voltage tap with the appropriate connection cable supplied with the equipment.

ELECTRIC TAP FOR ASPIRATOR A4

Tap to which is connected the electric supplying of the aspirator.

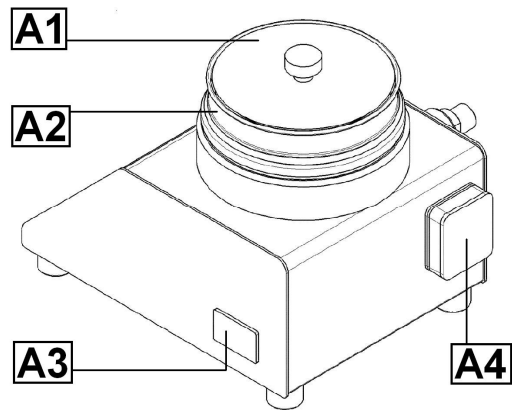
MOUTH PIECE OF THE ASPIRATOR

PIPE A5

The aspirator pipe is connected to this mouth piece; the aspirator is used to create the vacuum

REGULATION COUPLING OF THE VACUUM A6

After starting the aspirator, it is possible to increase or decrease the generated vacuum degree by screwing and unscrewing this regulator device.



Dimensions and weight

LENGTH	430 mm
WIDTH	407 mm
HEIGHT	340 mm
WEIGHT	20kg circa

Electrical supply

VOLTAGE	230 V
PHASE NUMBERS	1
FREQUENCY	50Hz
SIEVING MACHINE POWER	100 WATT
ASPIRATOR POWER	1300W

Noise

The air noise emission levels shown do not necessarily imply the levels of exposure to the worker.

The levels of exposure to the operator are obviously linked to the emission levels of the appliance; however other factors influence the levels of exposure to the operator: length of exposure, environmental characteristics, the presence of other machines etc.

The appliance emission levels allow anyway an estimate to be carried out on the dangers due to noise.

If the daily personal exposure is equal to or more than 85 dB (A) it is advisable to use the Individual Protection Devices (protective headphones, plugs, etc.). If the daily personal exposure is equal to or more than 90 dB (A) it is compulsory to use Individual Protection Devices (protective headphones, plugs, etc.). For further information consult the standards in force in the country of installation.

Average continuous equivalent acoustic pressure level L_{aeq} to the distance 1.5 m 61 (A):

Level of acoustic power emitted by the LWA device xx dB (A):

Standard EN ISO 3746

4. INSTALLATION

4.1. UNPACKING

Before the installation, carefully examine the delivery for possible damage or missing parts. Open the crate 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.

Check that the mains cord is compatible with the local standard.

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

Location

The equipment must be placed in an ideal position and environment for the use it has been conceived for (laboratory use and protected atmospheric agents) and that the machine is placed by a qualified operator.

Allowed temperature: from +5 dg. C to +40 dg. C

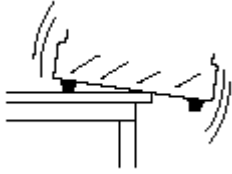
Allowed relative Humidity: from 30% to 70%

Maximum height over sea level: 1000m

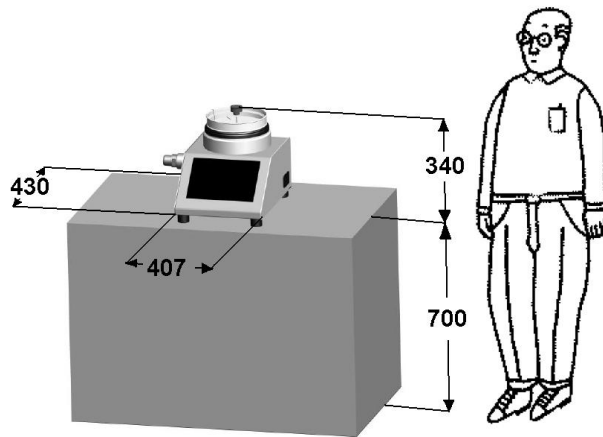
GENERAL ADVICE

- The machine must be installed in an area which allows ease of access to all parts so that maintenance may be carried out.
- Unauthorised people and objects which could be potential sources of danger must not be permitted in the area surrounding the machine.
- Do not position the equipment near instruments or appliances which could produce vibrations.

The appliance rests on rubber feet and had to be placed on a plane surface for a better stability, otherwise it may capsize and cause injuries.



For an easy use it is advisable to place the appliance at about 700 mm height from the ground surface. The required minimum space for the installation is 430x407x340. The control panel preferably has to be placed and fixed at such a distance that doesn't interfere with the equipping and sample loading operations.



Electrical connection

Wiring of the electrical system must be carried out by qualified personnel.

Before wiring consult the electric plan linked to the instructions manual and the registration plate on the machine for information regarding supply, frequency and nominal current.

Connect the earthing system via the PE terminal (yellow-green) before any other connection.

Apply a knife switch at the top of the connecting cable of the machine to the power system.

The knife switch must be combined with a safety device against the overload with a differential switch (safety switch).

The technical features of the safety device must be in accordance with the standards in force in the country where the machine has been installed

ELECTRIC TOLERANCES:

- Real voltage $\pm 10\%$ of the nominal one
- Frequency: $\pm 1\%$ of the nominal one in a continuous way
 $\pm 2\%$ of the nominal one for a short period
- The harmonic distortion of the sum from the second to the fifth harmonics not more than 10% of the total voltage as a real value between the conductors. A further distortion of 2% is accepted for the sum from the sixth to the thirtieth harmonics of the real total value between the conductors.
- With reference to the voltage imbalance of the three-phase voltage, the inverted sequence component and the zero sequence component must not be more than 2% of the direct sequence component of the voltage.

- The voltage pulses must not last more than 1,5 ms with an up/down time between 500 ms and 500 ms and a peak value not higher than 200 % of the real value of the nominal tension.
- The electric supply must not be interrupted or zeroed for more than 3 ms at any time. Between two interruptions it must not take more than 1 s.
- The interruptions must not overcome 20 % of the tension peak for more than one cycle. Between two interruptions it must not take more than 1 s.

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

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

- Put the device on smooth, horizontal and stable place.
- Leave enough space beyond the device for normal air circulation, min. 200 mm at the back of the machine.
- 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.

Note: The machine should not be placed so, that it is difficult to pull out the cord plug from mains power supply.

4.3. CONNECTING THE POWER CORD

The correct voltage and frequency for the LMAJ200 are given on the name plate. Ensure that these values correspond to the available power supply system.

Fit one end of the power cord, included in the delivery, into the mains socket on the machine. Connect the other end of the cord to a grounded wall socket.

To avoid interference from noise, surges and spikes, a dedicated line is preferred. If no such line is available, avoid lines to which powerful electric motors, refrigerators and similar devices are connected.

The power can be turned on and off by the emergency switch, located on the front cover at the right side of the machine. Light in the switch indicates, when the power is on.

4.4. ENVIRONMENT CONDITIONS

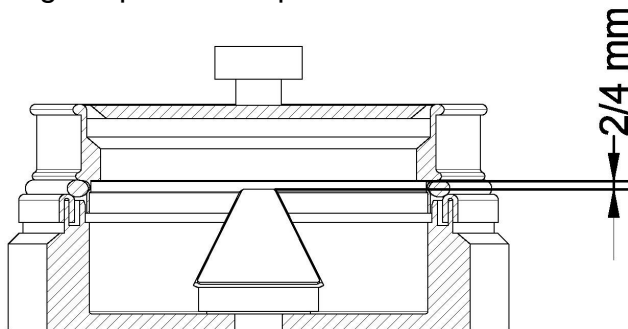
The machine has been built for operating in laboratory environment. Therefore the environmental conditions should be the following:

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

5. INSTRUCTIONS FOR USE

Before setting the machine in motion it is essential that the Operator and Safety Manager have read the Instructions Manual and understood all parts of the machine and activities linked to it (Risks, Dangers, Functionality, Operation, Protections, Commands, etc.)

Before using the appliance, check that the distance between the sieve bottom and the aspirator mouth is between 2 and 4 mm; this distance has been already checked in the factory during the production phase.

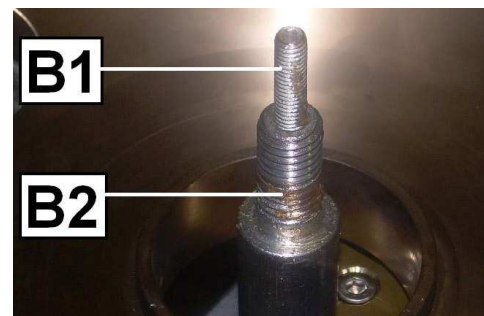
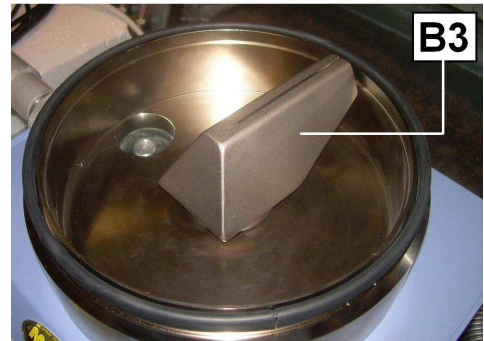


It is suggested to make a periodical inspection, especially if several types of sieves are used, by following these instructions:

1. Unscrew the aspirator mouth **B3**
2. The rod **B2** is supplied with a regulation screw **B1** on its end that determines the aspirator mouth's height compared to the sieve.

By tightening the screw the distance between the sieve and the aspirator's mouth increases, while by unscrewing it the distance decreases.

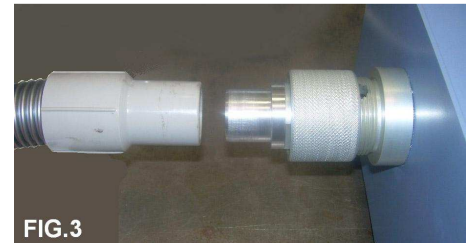
ATTENTION: the opening of the aspirator's mouth have to be free of deposits.



Connecting the aspirator to the sieve shaker

In order to start the sieving it is necessary to connect the aspirator to the sieve shaker as explained in the following instructions:

- connect the aspirator's pipe to the mouth piece **A5** of the sieve shaker (pic.3).
- connect the aspirator's feeding cable to the input **A4** that is placed on the back side of the sieve shaker.



Machine Calibration-meters-indicators

The machine is checked in the factory, using sample equipment periodically checked by officially recognised institutes. These checks cannot guarantee that the machine, meters and indicators will provide accurate values and results conforming to the standards in force in the countries the machine has been installed and used in. Normally such norms envisage calibration check after every movement. In order to obtain correct values and results it is therefore VITAL that the operator, once the machine has been installed and set up and before official tests, has an officially recognised body check the machine characteristics, its calibration and results/values reliability. The manufacturer is exempt from all responsibility in the case of direct and indirect damage from use of the machine without official approval by the relevant bodies.

As explained before, the sieve shaker is supplied already calibrated; in case it was necessary or it was required to check that the visualized vacuum value is correct, you have to contact the technical assistance service.

Place the material to be sieved

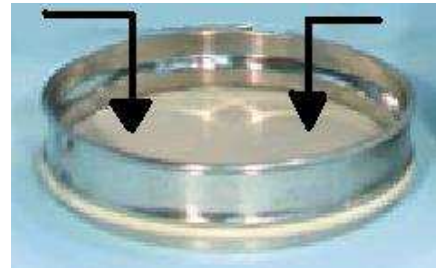
The material which have to be sieved must be put in the upper sieve; after that, cover the sieve with the lid **A1**.

If there is an high quantity of material, the sieving will take longer and the test will be more accurate.

The maximum material size must be checked. The material (that must be granulated) have to move on the sieve when the aspirator mouth is working.

The weight have to be in compliance with the kind of test to be executed. Our general recommendations for Ø 200 mm are:

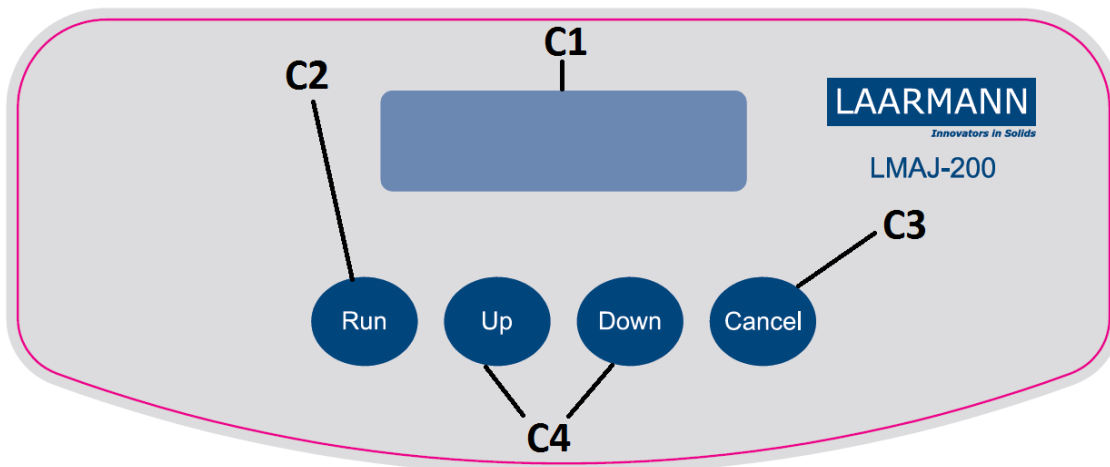
- Normal condition. Sieves with a 0,040 mm opening: 20 gr.
- Heavy materials with good smoothness: up to 50 gr.
- Light materials hard to be sieved and sieves with opening less than 0,040 mm: 10gr.



Switch on the equipment

To switch the sieve shaker on press the general switch, and place it on the "I" position.

Control panel



The control panel is composed by 4 keys and one luminous display; it allows to select and visualize the main functioning parameters of the sieve shaker.

CONTROL PANEL OPERATING FEATURES

The control panel is composed by:

- **A display C1** composed by 4 figures, divided in 2 groups of 2 figures each; the 2 figures on the left shows the reached vacuum value (expressed in millibar), the 2 figures on the right shows the selected total time of the sieve-shaking.
- **A starting key C2:** by pressing it the sieving starts working.
- **A stop key C3:** it is used to stop the timer and sieving phase.
- **2 keys C4:** used to increase and decrease the sieving time

Every time that a key is pressed a bip will be given out.

TIMER'S ADJUSTEMENT

After switching the sieve-shaker on and before beginning the sieving by pressing the 2 keys **C4**, it is possible to increase and decrease the sieving time. After having selected the desired time, press **C2 once** to save the selected value.

ATTENTION: it is necessary to press C2 once to save the setting every time the sieving time has been modified.

START-UP

Press **C2** to start-up the sieve-shaking; the timer will automatically begin the count-down of the selected time and will stop at the end; when the sieve-shaking ends the previously selected time will automatically appear on the screen.

NORMAL STOP

It is possible to stop the sieve-shaking before the end of the selected time, by pressing **C3**; **when the sieve-shaking is restarted, the previously selected time will automatically appear on the screen**

HOW TO STOP MOMENTARILY THE SIEVE SHAKING (PAUSE FUNCTION)

During the sieve-shaking it is possible to suspend it momentarily by pressing **C2** once: that enables the operator to run settlement operations of the material as well as equipping operations; the pause is pointed out by the flash of the figures on the display, showing the missing time.

To re-start the sieving press **C2** again; **in this case the count-down will start again from the point in which it had been previously stopped.**

HOW TO RE-SET UP THE TIMER DURING THE SIEVE-SHAKING

Press **C2** During the test to modify the remaining sieving time; the sieving will be immediately stopped; the suspension is pointed out by the flashing of the figures indicating the remaining time; at this point it is possible to adjust the timer using the 2 keys **C4**.

After having reselected the sieving time, press 2 times **C2** to restart the sieve shaking **(once to save the selected time and once to re-start the test).**

Vacuum Adjustment

To adjust the vacuum produced by the sieve-shaker, it is necessary to roll **A6**; unscrew the coupling to reduce the depression and screw it to increase the depression.

The increase and the decrease of the vacuum produced by the aspirator will be displayed on the screen.

In accordance to UNE-EN 933-10 Standard "*Test for the determination of arid geometric properties*" the recommended pressure is $3,0 \pm 0,5$ kPa (-30 millibar). Anyway we suggest to run more tests in order to be able to determine the correct pressure for different kinds of materials. The too soft materials (easy to be pulverized) must be sieved with the possible lowest pressure.

In case of emergency it is possible to stop the sieve-shaker by pushing the general switch **A3** and by placing it on 0 position.

Restart after emergency stop

To re-start the sieve-shaker push the general switch **A3** and place it on "I".

Switching OFF

Press **C3** to stop the sieving machine

Test start up

Before using the appliance regularly check it is working correctly by carrying out at least one complete empty cycle according to the previous instructions.

Should there be any problem consult the chapter "DIAGNOSTICS".

If the instructions in this manual do not provide the solution to the problem, contact Sales Assistance.

Suggestions for the aspirator usage

Some suggestions are listed as follows; they allow the operator to use the aspirator correctly:

- Remove or do not assemble the paper filter on the aspirator in order to use it correctly, but leave the plastic bag.
- During the test, every time that the vacuum created by the aspirator is not enough to satisfy the requirements declared by the Standard, activate the control of the filter cartridge automatic cleaning (the aspirator's filter cartridge could be dirty); in this way the aspirator will work at its maximum potentialities.
- If the vacuum created by the aspirator will not be enough even after the filter cleaning operation, it is necessary to replace the filter cartridge placed in the sieve shaker. Consult the instructions enclosed to the aspirator in order to replace the cartridge filter of the sieve shaker.

NEVER SUCK IN WITHOUT THE CARTRIDGE FILTER!!

PRACTICAL EXAMPLE OF USAGE

Hereunder we describe a “ standard-procedure” which allows even to an operator without a wide experience to carry out a test.

Naturally the operator experience will allow to optimise the machine performances on the basis of the customer needs

In order to have several points in the grinding material curve, start the test with the sieve with smaller openings and sieve the material that has not been passed through the sieve with larger openings. Follow the same procedure using other openings and repeat it depending on how many divisions the operator would like to obtain.

The hygroscopic products absorb the humidity of the air during the sieving procedure. This could be the reason of some measuring mistakes.

To avoid this kind of mistakes it is suggested to dry the material before and after every test.

1. Check the distance between the sieve and the aspirator mouth as described in chapter “**SET UP**”
2. Position the material to be sieved as described in chapter “**HOW TO PLACE THE MATERIAL TO BE SIEVED**”
3. Connect the aspirator to the sieve shaker as explained in chapter “**HOW TO CONNECT THE ASPIRATOR TO THE SIEVE- SHAKER**”
4. Switch the sieve-shaker on by pressing the general switch **A3**.
5. Adjust the timer as described in chapter “**TIMER'S ADJUSTMENT**”. In accordance to the UNE-EN 933-10 Standard, 2001 edition, the sieve shaking time can be considered concluded when the weight does not change more than 0,1% in one minute.
6. Start the instrument by pressing **C2**
7. During the sieve-shaking process it is advisable to hit the cover with the plastic hammer to remove the dust of the material. [It is possible to stop the](#)

machine under vacuum and the air sieve-shaker to remove with a brush the residual materials that may have produced.

8. Wait or the end of the sieve-shaking time selected on the timer, when the time is expired the sieving will stop (to stop the test before the selected time press **C3**).
9. When the sieving ends, it is necessary to weigh the material that is still on the sieve. To avoid loss of material, brush the inner surface of the cover and brush accurately the openings when the pulverized granules are put on another sieve.

6. Maintenance

Do not perform maintenance – interventions on the machine which have not been quoted and described in this instructions manual without first contacting the manufacturer.

Periodically clean all machine parts and oil the unpainted parts in order to preserve the machine and its efficiency.

Avoid the use of solvents which damage paint and parts in synthetic material.

How to clean the sieve-shaker:

- To remove the aspirator's mouth, pull it upwards.
- Connect the sieve-shaker and clean the aspirator's mouth with a brush and the sieve- shaker's body and its inner part with a vacuum cleaner.

ATTENTION: do not turn the aspirator's mouth **B3** with hands

How to clean the aspirator:

Consult the chapter "SUGGESTIONS FOR THE ASPIRATOR USAGE" for the aspirator cleaning operations.

How to clean the sieves:

Clean carefully the lower part of the sieve with a soft brush. Do not push and do not hit the sieve's mesh.

The most efficient way to clean the sieves is an ultrasonic cleaner. To increase the effectiveness of the cleaner, use a water detergent.

7. TROUBLE SHOOTING

This chapter presents and discusses all the simple problems which could occur during machine use. The appropriately qualified, professional personnel must carry out all the maintenance procedures, check and control, as well as all the repair operations on parts of the machine or the electrical system.

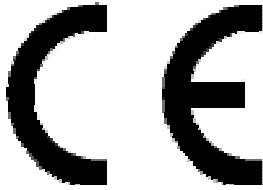
Contact Technical Sales Assistance for any other problem not listed on the previous table or should the malfunctioning persist after the intervention of the operator in accordance with the previously mentioned courses of action.

PROBLEM	POSSIBLE CAUSE	REMEDY
When pressing A3 the control panel does not switch on	Fuses are broken	Replace them
	Lack of supply	Check the connection to the power grid
When pressing A3 the control panel switches on but the aspirator's mouth does not turn.	Damage in the electric system	Check the electric system
	Ratiomotor malfunctioning	Ratiomotor replacement
It is not possible to reach the vacuum value as required by the Standard	Damage of the vacuum sensor	Replace the sensor
	Blow-by from the suction equipment	Find the 3 filaments and remove them
	The aspirator does not work properly	Clean the filters; look at the "SUGGESTIONS FOR THE ASPIRATOR USAGE" chapter.

8. CE certificate

LAARMANN

**Airjet Sieve machine
Type LMAJ200**



Product	Airjet Sieve machiner
Model	LMAJ200
Power supply	230V/50Hz

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 facilities
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, June 2015

Marc van Daal