



# CM4000 CUTTING MILL USER MANUAL

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## Preface

Only original LAARMANN replacement parts respectively purchased parts complying with the original state may be used. Guarantee claims are only valid if no changes are made to the original state of the cutting mill. We assume no liability for damage caused by failure to comply with these instructions or by inappropriate behaviour. This technical manual may not be duplicated or passed on to third parties, either totally or partially.

### Supplied technical documentation

The following documentation was supplied together with the machine: Operating manual for the cutting mill

### Factory number

The machine number is located on the nameplate..

This machine number must be stated when making any technical inquiries.

## 1 Safety

LAARMANN cutting mills are built in accordance with recognized rules of engineering. The latest safety standards have been taken into account in order to avoid any dangers to the operator's life or health when the machine is used for its designated purposes.

Ideally, the operator should be a professional tradesman. The owner of the machine should also provide in-depth training for the operator, focusing on the general technical and, more specifically, the safety relevant functions of the machine.

The operator should be obliged to read the operating manual before starting up the machine. The manual must always be at hand during operation, maintenance and servicing.

The manual must be attached or kept close to the machine and be readily available to the operators at all times.

It is the operator's responsibility to observe the safety-relevant regulations and standards. The accident prevention rules of the trade associations must be observed.

## 1.2 EC standards and national regulations for the prevention of accidents

LAARMANN cutting mills are designed and built to meet the following European standards and national (German) laws and regulations specified by the customer for the prevention of accidents.

### 1.3 Occupational safety

The LAARMANN cutting mill is designed for low noise levels and is available with or without an integrated sound enclosure. Especially when milling brittle and impact resistant material, all personnel working in the direct vicinity of the mill should wear ear protectors.

The measurement of emissive sound pressure levels (to ISO 11202: 1993) at maximum performance yielded a value of approx. **L = 89 dB (A)**. Depending on the material and the shape of the parts to be cut as well as the environment where the milling process will take place this value may vary. For obliging statements regarding noise level for specific parts or materials, tests with these parts are necessary.

Under regular operating conditions the emissive noise pressure level is usually lower, at **83 dB(A)** or lower depending, among other factors, on the type, temperature and amount of material that is fed into the mill. The primary hazard area of the mill is the cutting chamber with the rotating rotor. The entire safety design of the machine ensures that this hazard area can only be accessed when the rotor is stationary.

When opening the mill after switching off the drive motor, the mechanical interlock between the cutting chamber and the suction box / sack filling box ensures that the opening of the mill takes so much time, that the rotor has stopped completely before the cutting chamber can be accessed.

The safety features also ensure that the mill can only be activated when it is completely closed and the suction box / sack filling box have been firmly inserted.

A final limit switch located at the suction box / sack filling box disconnects the machine's power supply as soon as the respective filling device is pulled out of the mill. The filling device ensures that the interlock will prevent the cutting chamber from being opened before the suction box / sack filling box has been pulled off

### 1.4 General safety instructions

Before undertaking any service or cleaning activities, be sure that the main switch (on the control box) has been switched off.

When working on the motor or the electrical control system, the power supply must be disconnected.

- Be sure to wear leather gloves when working in the grinding chamber or on the knives.
- The knives have sharp edges and can easily cause injury.
- Use caution when opening and closing the grinding chamber and when removing and inserting the hopper, to avoid catching and pinching the extremities.
- Be sure to wear safety goggles when sharpening the knives and when using pressurized air for cleaning.
- Examine the mains power cable and control box regularly for damage. Machines with damaged power wiring or control systems must be disconnected from the power line immediately and must not be operated again until they have been repaired by qualified personnel.

To avoid accidents or damages of the machine, all modifications of the mill may only be carried out after consulting LAARMANN with regard to the planned modification. Otherwise the modification of the mill will lead to expiry of warranty and product liability - in this in this case LAARMANN will not take any responsibility for damages or injuries caused by accidents.

## 2 Transportation, handling, storage

### 2.1 Transportation

The machine is usually placed on a palette for shipping. The machine's dimensions ensure that no damage can occur under normal shipping conditions. The mill is wrapped in plastic sheeting for transportation.

Depending on the available handling device (crane, forklift), choose a suitable suspension arrangement to prevent damage to the mill. Steel sling ropes to DIN 3088 or manilla ropes to DIN 83321 must be chosen in appropriate sizes in accordance with the specified weight of the mill. We recommend you use two-rope suspension gear.

### 2.2 Inspection upon receipt

Check the delivery for completeness and signs of shipping damage. Any shipping damages must be confirmed to the customer in writing by the carrier. Immediately submit any claims in writing to the following address:

LAARMANN GROUP B.V.

Op het Schoor 6

6041 AV Roermond, Netherlands

Tel: +31 (0) 6 23 40 00 33

### 2.3 Storage conditions

When intermediate storage is required upon delivery, be sure to:

- choose a dry room with a moderate temperature (approx. 18° C)
- leave the mill in the plastic sheeting
- avoid storing the mill outside. If this is inevitable, be sure to:
  - leave the mill in its original packaging
  - provide an additional rain cover for the mill
  - repair any defective paint work immediately
  - position the mill on squared timber or a palette.

As a rule, damages caused by inadequate storage will void any claims under the warranty.

## 3 Transportation, handling, storage

Electrical details	3x400V
Rotor Speed	350 rpm
Motor Power	5.5 KW
Cutting chamber	250mm * 250mm
Number of rotor knives	12
Dimensions	900 x 1025 x 1930 mm
Weight	380 kg

## 4 Initial start-up

### 4.1 Setting up the mill

There must be sufficient space at the location of the mill for feeding, vacuuming and bagging the material.

The mill must be positioned and fixed properly on a plane and rigid surface, such as a paved or concrete floor in order to ensure stability and easy operation.

### 4.2 Inspection prior to initial start-up

- Examine the milling chamber for foreign objects.
- Remove the anti-corrosive agent from the blank parts of the mill.
- Turn the rotor manually to make sure that it runs smoothly.
- Power on the mill for just a moment to check the rotational direction. (for units without a phase controller)

Caution! Always wear protective gloves when working inside the milling chamber. The cutting knives may cause injuries!

### 4.3 Electrical connection

The mill is supplied with an IP66 main switch and connection box IP65 for the safety switch, connections to this switch must be done by a qualified electrician.

## 5 Operational characteristics

### 5.1 Technical description of the machine

The material is cut by very sharp knives inside the mill. This cutting takes place between the revolving rotor knives and the static stator knives.

The cutting geometry of the rotor and stator knives, as well as the size of the cutting gap, depend on the material that is to be processed; in most cases a cutting gap distance of 0.15mm is ideal.

In order to keep the throughput rate constant and preserve the quality of the material, the condition of the knives and screen must be checked regularly.

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### 5.3.1 Working procedures - Rotor

The design of the rotor plays a decisive role in the performance and throughput of the mill. The experience and expertise of LAARMANN is your guarantee for an ideal cutting geometry and non-vibrating performance of the rotor. Alterations to the rotor leading to out-of-balance behaviour are inadmissible and may cause breakage of the bearings and knives. The rotor can be accessed by opening the hinged upper part of the cutting chamber.

### 5.3.2 Working procedures - Opening and closing the mill

#### To open the mill:

1. Switch off mill - main switch (position O)
2. Loosen both star grips on the vacuum / bagging container and turn them open at equal rates. Finally, pull out the suction box / sack filling box towards the front.

**Caution!** Never attempt to shorten the threads of the star grips on the vacuum container! The time that is needed to unscrew the grips and the actuation of the interlock caused by unscrewing the grips ensure that the rotor comes to a standstill before the cutting chamber can be opened.

3. Unscrew the closing screw of the cutting chamber and fold open towards the front; then fold open the cutting chamber and the hopper.
4. Remove the catch on the screen clamp by pulling the closing screw towards the front and fold down the screen clamp. The cutting chamber is now accessible. You can pull out the screen manually or by using a pair of pliers.

#### To close the mill:

1. Clean the cutting chamber, the rotor and rotor knives, as well as the stator knives and the screen, ideally with the help of a vacuum cleaner.
2. Check the condition of the cutting knives and their attachments.
3. Close the upper part of the cutting chamber manually.
4. Pull the screen clamp with the closing screw upward until the screen clamp locks in place.
5. Insert the closing screw into the appropriate opening and tighten manually. The cutting chamber and screen clamp are now fastened against the knife support.
6. Push the suction box back in and fasten by tightening the star grips.
7. Connect with the power supply.
8. Activate the main switch (position I).

### 5.3.3 Working procedures - Opening and closing the mill

The cutting knives become blunt after a certain service time. Therefore you should check them regularly. Blunt knives may cause several effects, such as:

1. Reduced throughput
2. Increasing temperature of regrind material
3. Higher power consumption of the motor
4. Increasing amounts of dust in regrind material.

### *Resharpener the cutting knives:*

The following section describes the procedure for disassembling and reassembling the cutting knives. Cutting knives, especially the rotor knives, must always be sharpened or replaced as a complete set of knives with equal lengths. The cutting knives must be sharpened very carefully by a specialist using a surface grinding machine. We recommend using grinding wheels (grade 40 H or 46 K). Make sure that only a small grinding allowance and sufficient cooling agent is used in the sharpening process.

Cutting knives with grinding cracks must not be reused, as they may break during operation. If you are unable to sharpen the knives in the proper manner, we will gladly do this for you.

### *Important:*

The rotor knives must be sharpened on the flat side as shown on the picture. The stator knives are invertible and should be sharpened on the face sides.

Caution! Always wear protective gloves when working inside the cutting chamber. The cutting knives may cause injuries!

### *Disassembly:*

1. Open the mill (see 5.3.3).
2. Prevent the rotor from turning by e.g. using a piece of wood to block up the rotor.
3. Untighten the knife fastening screws.
4. Remove the knife (and its cover in the case of the stator knife, you may have to knock).

### *Assembly:*

1. Clean the knife seats and thread holes.
2. The rotor knives are mounted to stop in the knife seats. For the stator knives, apply the knife cover and hand-tighten the screws.
3. Adjust the cutting gap (0,2 – 0,3 mm) and ensure good clearance.
4. Tighten the knife fastening screws with a torque wrench (required torque: 80 Nm.)
5. Finally, slowly turn the rotor to make sure that there is enough clearance between the knives.

### *Readjusting the cutting gap*

The cutting gap is adjusted by repositioning the stator knives.

1. Untighten the fastening screws of the stator knives.
2. Insert a 0,2 – 0,3 mm feeler gauge between the stator knives and rotor, and reposition the stator knives.
3. Hand-tighten the screws, and slowly turn the rotor knives backwards.
4. Check for good clearance.
5. Tighten the fastening screws of the stator knife front - with a torque of 120 Nm. Tighten the fastening screws of the stator knife back - with a torque of 90 Nm.



**6 Usage**

**6.1 Area of use**

There must be sufficient space at the location of the mill for feeding, vacuuming and bagging the material.

The mill must be positioned and fixed properly on a plane and rigid surface, such as a paved or concrete floor in order to ensure stability and easy operation.

**6.2 Inspection prior to initial start-up**

Problem	Possible causes	Solutions
Mill does not start after connecting to the power supply	<ul style="list-style-type: none"> <li>Not all 3 phases available in the socket</li> <li>Suction or bagging box not inserted properly</li> </ul>	<ul style="list-style-type: none"> <li>Check phases one by one</li> <li>Insert suction or bagging box firmly</li> </ul>
Mill blocks, jaws or shuts off	<ul style="list-style-type: none"> <li>Excess scrap material</li> <li>Foreign object in scrap.</li> </ul>	<ul style="list-style-type: none"> <li>Clean mill, revolve rotor to check for unhindered movement of knives. Reduce amount of material or portions fed to the mill.</li> <li>Open mill to remove foreign object from cutting chamber. Check knives, screen and screen clamp for damage and replace, if necessary.</li> </ul>
Mill produces product with too much dust content	<ul style="list-style-type: none"> <li>Knives are blunt or damaged.</li> <li>Cutting gap not appropriate.</li> <li>Screen clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Sharpen or replace knives altogether.</li> <li>Check cutting gap and eadjust.to 0.15mm, if necessary.</li> <li>Clean or replace screen.</li> </ul>
Product contains splinters and large parts.	<ul style="list-style-type: none"> <li>Holes in screen too big</li> <li>Screen clogged.</li> </ul>	<ul style="list-style-type: none"> <li>Insert screen with smaller holes.</li> <li>Replace screen</li> </ul>
Side walls in upper part of cutting chamber show signs of excessive wear(pitting).	<ul style="list-style-type: none"> <li>Abrasive materials have caused excessive wear of the cutting chamber walls.</li> </ul>	<ul style="list-style-type: none"> <li>Replace cutting chamber with inserted wear-resistant, hardened plates. Insert hardened plate in rear wall.</li> </ul>

## 7 Maintenance and servicing

Clean the mill prior to any maintenance or servicing procedures. When cleaning the mill, always wear protective gloves and use a vacuum cleaner. To clean the mill, first remove the suction box, fold open the upper part of the cutting chamber and remove the screen. Tough material should be removed with the help of a tool. Major servicing work should be done by LAARMANN. The electrical system must be serviced by a qualified electrical technician. If the mill is completely powered off for maintenance or service work, you must prevent it from restarting unexpectedly by shutting off the main control unit or pulling out the power plug. If necessary, clear the entire maintenance area.

maintenance plan.

Component	Maintenance procedure	Maintenance interval
Safety devices	Functional control	Twice a month
Knife fastening screws	Check for tightness with a torque wrench (80 Nm)	Once a month
Screen	Wear inspection	Once a month, but also with every change of material
Side and rear plates	Wear inspection	Twice a year
General inspection	Condition and mounting of castors, quick release latches, connecting cable, control box	Twice a year but also when other service works are done

## 8 Placing out of service and disposal

### 8.1 To stop and isolate mill

Use the master switch (which also serves as an EMERGENCY OFF switch) to place the mill out of service.

### 8.2 Useful information in case of an emergency

Please proceed as follows in the event of malfunctions that might be dangerous:

- Immediately stop the machine by activating the EMERGENCY OFF switch (master switch) and disconnect the power plug.
- Never attempt to extinguish a cable fire with water or foam. Instead, use a powder or carbon dioxide extinguisher (follow the instructions for the fire extinguisher!).

### 8.3 Disposal

At the end of the mill life cycle, all its individual components and materials must be properly disposed of or recycled.

Disposal of waste oil:

Waste oils, transmission oils and lubricants (machine greases) must be brought to an authorized waste disposal company.

Do not, under any circumstances, release these materials into the local sewage system or environment.

The following materials should be recycled:

- All ferrous, non-rusting sheet metals, screws, bolts and similar assembly parts
- Electric and electronic components
- All types of plastic
- Wooden pallets or crates (boards and squared timber).

## 9 Recommended replacement parts

To maximize the service life of your mill, use only original replacement parts from LAARMANN

## 10 Customer service

Please indicate the machine number. This allows us to send you the requested replacement parts faster. Please contact:

LAARMANN GROUP

Op het Schoor 6

6041 AV Roermond

The Netherlands

info@laarmann.eu

Please inform us immediately if you need the help of a service technician on site.



Cutting Mill  
Type CM4000

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Product	Cutting Mill
Model	CM4000
Power supply	400V/50Hz

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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	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