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IKA[®]





IKA®-Werke, Germany Reg. No. 004343

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Safety instructions

The M20 device may not be used in areas subject to explosion hazards.

Protective glasses must be worn when performing experimental cuts. In addition, suitable protective gloves must be worn when adding coolants.

Experiments involving comminution must be performed behind a protective wall (Plexiglas[®]-wall, exhaust hood or the like) in order to prevent injury caused by the sudden occurrence of excess pressure (possible bursting of the cover).

Please comply with all of the relevant safety regulations.

Correct use

IKA universal grinder M20 is suitable for carrying out low-loss grinlding of hard and brittle substances as of grain size 6 - 7mm. The grinders operate without creating dust or lost. Beaters, blades and grinding are replaceable. The useful volume of the grinding chamber is 250ml for the M20 grinder.

Hard and brittle ground material is crushed by means of beaters or blades ratating at high speed.

Oil substances or those that are given to smearing and which are not capable of being ground at room temperature have to be cooled for grinding (e.g. embrittled with liquid nitrogen).

Unpacking

Please unpack the equipment carefully and check for any damages. It is important that any damages which may have arisen during transport are ascertained when unpacking. If applicable a fact report must be set immediately (post, rail or forwarder). The M20 delivery quantity includes: one M20 grinder, one M21 stainless steel beater, one set of tools and operating instructioins.

Commissioning

Check whether the voltage specified on the type plate matches the mains voltage available. The power socket used must be earthed (protective earth conductor contact). If these conditions are met, the device is ready to operate after plugging in the mains plug. If these procedures are not followed, safe operation cannot be guaranteed and/or the equipment may be damaged. Observe the ambient conditions (temperature, humidity, etc.)

listed under Technical Data.

NOTE:



The grinder is designed for short term operation. Maximum operating time - 7 minutes. After that, the grinder must cool off for approximately 10 minutes.This condition does not apply if the grinders is connected to a cooling unit.

Motor Circuit Breaker

The grinder is protected against overload by means of an overcurrent protective device. In the event of overload the overcurrent protective device interrupts the current supply. Restarting is carried out by pressing-in the black button at the rear of the grinder. The motor is switched on via push-button at the front.

Description

The devive consits of three basic units (drive unit, middle part and cover) which are connected to each other by means of quick-release locks. When assembling the three units make certain that the hose coupling for cooling the middle part is located at the rear of the device. When putting on the cover make certain that the safety pin in the middle part is pushed down by the pressure pin on the cover. Otherwise, a tight and reliable connection is not ensured and the grinder will not start.

The device is started by pressing the push-button at the front.

Grinding

Fineness is mainly dependent on how long the grinding operation is performed.

If materials are to be ground that are smaller than a certain grain size then it should be sieved and the residue in the sieve is put back into the grinder. For sharp-edged material wich is thus very abrasive, it is recommended that the entire quantity is left in the grinder in order to additionally exploit the properties of the material.

Grinding while cooling

Plastic, soft or smeary materials have to be cooled if they are to be ground.

There are two hose couplings located at the rear of the grinder in order to connect the cooling brine. Cooling with tap water is usually sufficient for substances which become hot as a result of the grinding operation and are thus given to smearing or those that produce oil.

The grinding chamber may only be filled halfway especially when drugs containing oils and similar materials are ground.

If more refrigeration is required then the ground matter should be cooled prior to being put into the grinding chamber.

The followiung procedure shall apply if liquid nitrogen is used in order to embrittle the material to be ground:

Safety information:



Suitable protective gloves must be worn when filling and transferring liquid nitrogen!

Protective glasses must be worn!

• The sample to be ground is put into a suitable vessel (e.g. evaporating dish) and covered with enough liquidnitrogen until it is completely covered.

When using liquid nitrogen make certain that the sample is not capable of reacting with oxygen.

- Cool grinding chamber using liquid nitrogen.
- Put the deep-cooled sample into the grinder and grind approximately 15 seconds.

• Then open the grinder and add liquid nitrogen for only as long as it takes for the sample to become deep-cooled again (embrittled).

Safety information:



Make certain that the liquid nitrogen has evaporated before beginning the grinding operation.

NOTE: Danger of overpressure!

- Repeat the grinding operation for approximately 15 seconds.
- Repeat the sequence of cooling and grinding until desired finen-

ess has been achieved.

• If the required fineness has not been achieved after 5 minutes, then a further reduction in grain size is unlikely.

The respective grinding chambers are sealed by means of labyrinth sealings. Though they are dust-proof, they are not leak-proof. This should be taken into account for substances where liquids may escape.

Replacing the grinding tools

The grinding tool is fixed by means of the retaining tube and the cap nut is unscrewed by using the SW10 spanner. The grinding tool, which rests on a double-edge track, may then be pulled out.

Maintenance and cleaning

The **IKA** M20 is maintenace-free. It is subject only to the natural wear and tear of components and their statistical failure rate.

When ordering spare parts, please give the manufacturing number shown on the type plate, the machine type and the name of the spare part.

Please send in equipment for repair only after it has been cleaned and is free from any materials which may constitute a health hazard. Use only cleansing agents which have been approved by IKA to clean IKA devices. To remove use:

Dyes	isopropyl alcohol
Construction materials	water containing tenside / isopropyl alcoho
Cosmetics	water containing tenside / isopropyl alcoho
Foodstuffs	water containing tenside
Fuels	water containing tenside
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For materials which are not listed, please request information from **IKA**. Wear the proper protective gloves during cleaning of the devices.

Electrical equipment may not be put into the cleansing agent for cleaning.

The operator shall consult the manufacturer before using a methode of cleaning or decontamination other than the one wich is recommended by the manufacturer in order to make certain that the method wich the operator intends to wmploy will not damage the equipment.

Accessories

- M 20.1 spar grinding chamber with cover
- M 21 spare beater, stainless steel

M 22 beater, stainless steel

M 23 star-type blade, stainless steel

Technical data

Design voltage:	VAC	230±10%
or	VAC	115±10%
Deign frequency:	Hz	50/60
Permissible ambient temperature:	°C	+5 bis +40
Permissible relative humidity:	%	80
Degree of protction		
as in DIN 60 529:		IP 21
Rated speed:	1/min	20 000
Motor:		universal motor
Maximum motor input:	W	550
Ginding chamber useful volume:	ml	250
Permissible operating time		
(without cooling)	:min	7
Interference suppression:		as in VDE 0871
Dimensions:	mm	170 x 170 x 350
Weight:	kg	6,6