IKA®

Dry Mills

German technology
made in the USA

Dry Mills | From bench-top to pilot-scale!

IKA® laboratory mills are ideal for coarse and fine particle size reduction, either in batch or continuous operation.

Grinding results of up to 1 µm particle size or 0.25 mm defined ultimate fineness can be easily achieved. Due to a broad spectrum of easily interchangeable beaters/cutters, IKA® mills are highly effective for a variety of applications.

COMING SOON:
IKA® introduces the world's first disposable grinding tube system which eliminates the possibility of cross-contamination and saves on associated cleaning costs.

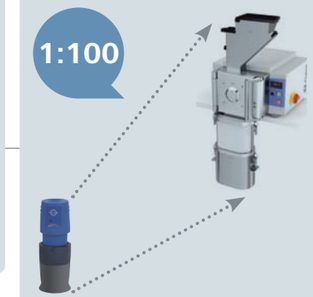
IKA® is also going to introduce a brand new A 10 basic mill with enhanced safety features. It is conceptually similar to the existing A 10 basic mill, but includes advanced features such as a digital timer, interval operation, error code display and many more improvements.

Anticipate our newly created pilot mill with modular design that allows for easy conversion from a cutting mill to an impact mill.

IKA®+

Scale-up principle

IKA® mills have a high degree of flexibility and scalability. Therefore, ensuring reliable scale-up by offering the possibility to work with the same method from formulation development to small-scale production.



A 11 basic	3.0 kg	**process mills**	approx. 70 kg

World´s first

3 Year warranty*

* 2+1 years after registering at www.ika.com/register, glassware and wearing parts excluded

Protection class according to DIN EN 60529: Min. IP 21

CE | c UL US LISTED

Tube Mill control | **Fast, safe & clean**

World´s first

Dust-proof sealed housing
High level of user safety

Interval operation available
Easy operation with touch keypad

Quiet operation

Adjustable safety speed and time

Clearly arranged, multi-lingual OLED display, Error code display

USB interface to control and document all the parameters and for updating your firmware

IKA +

World's first

> Disposable grinding chamber
> Stops cross-contamination
> No cleaning required
> Perfect milling results
> Large application range

World's first disposable grinding tube system for safe, instant and precise milling results. Its' unique and compact design makes the unit space saving and ultra-portable. The disposable grinding chamber eliminates the possibility of cross-contamination and saves on cleaning costs and time. The ability to cool the sample with dry ice expands the application range enormously.

Disposable grinding chamber

After grinding, a part of the sample will be analyzed. The remaining sample can either be discarded or it can be stored as a reference sample directly in the grinding chamber. In the latter case, grinding chambers can be labeled and either stored in a refrigerator or in a drying room. Reference samples can be re-analyzed and traced at any time.

IKA +

No cleaning costs

The grinding chamber can either be disposed of after the test or it can be used for storage of the processed sample. This new procedure will save on both time and money. As no cleaning of the tube system is required, the user is safe from aerosol formation that frequently occurs during cleaning procedures.

A 10 basic | Analytical batch mill

Protection — Electronic overload protection

Built-in cooling chamber

A 14 Spare cutter

Suitable for crushing materials up to Mohs hardness 5. Included with A 10.

Ident. No.	Price
1059300	on request

A 15 Hard metal cutter

Made of tungsten carbide for hard materials up to Mohs hardness 9. Not included with A 10.

Ident. No.	Price
1059100	on request

A 17 Star-shaped cutter

Used to crush fibrous substances such as paper and vegetation, but also for plastics and material with a low specific weight. Not included with A 10.

Ident. No.	Price
1462700	on request

A 18 Grinding chamber reduction

Included with A 10.

Ident. No.	Price
2318200	on request

A 10 basic is used for low-loss grinding of soft, hard and brittle substances of up to 50 ml with a Mohs hardness of up to 9

A 10 basic | Advanced technology

Newly designed batch mill for dry grinding of hard, brittle, soft and fibrous materials for volumes up to 50 ml. Due to the embrittlement of samples directly in the grinding chamber, tough, oily and aqueous samples can also be ground.

During development of the mill, particular emphasis was placed on safety. The mill will only start when the lid is closed and it can only be opened at a standstill. A quick stop feature further increases the safety of the user.

Protection — Overload protection

Integrated cooling connections

Quiet operation

LED Display — Digital timer

Interval — Interval operation available Easy handling with keypads

Brushless — Brushless motor for longer life span

Easily exchangeable beater/ cutter

IKA®+

Special safety features

> The mill can only be operated if the lid is closed
> The lid can only be opened at a standstill
> A quick stop feature further increases the safety of the user

A 11 basic | **Analytical batch mill**

A 11 basic is the best choice for impact and cutting grinding of hard, brittle and non-elastic substances by means of interchangeable cutting and grinding tools. Various grinding chamber sizes enable the crushing of small volumes all the way up to 250 ml with a Mohs hardness of up to 9.

A 11.1 Spare beater

For pulverizing substances with a Mohs hardness up to 6. Included with the analytical mill A 11 basic.

Ident. No.	Price
2904600	$ 54

A 11.2 Cutting blade

For pulverizing soft, fibrous grinding materials.

Ident. No.	Price
2905200	$ 131

A 11.3 Beater

For pulverizing substances with a Mohs hardness up to 9, coated with chromium carbide.

Ident. No.	Price
2983000	$ 193

A 11.4 Grinding chamber

Made of polycarbonate with stainless steel inlet. Not suitable for cooling with N_2, only applicable with double beater A 11.6.

Ident. No.	Price
2904100	$ 187

A 11.5 Spare grinding chamber

Made of Tefcel (ETFE, glass fibre-reinforced) with stainless steel inlet.

Ident. No.	Price
2983100	$ 252

A 11.6 Double beater

For use up to Mohs hardness 3. Only applicable with grinding chamber A 11.4.

Ident. No.	Price
3302900	$ 381

A 11.7 Funnel

Prevents splashing of liquid nitrogen when pouring into the grinding chamber A 11.5.

Ident. No.	Price
3048700	$ 311

IKA®+

A 11 basic can be used for embrittlement of grinding materials with liquid nitrogen in the grinding chamber.

M 20 | **Universal batch mill**

M 21 Spare cutter

Suitable for crushing materials up to Mohs hardness 5. Included with M 20.

Ident. No.	Price
0328200	$ 95

M 22 Hard metal cutter

Made of tungsten carbide for hard materials up to Mohs hardness 9.

Ident. No.	Price
0521800	$ 466

M 23 Star-shaped cutter

Used to crush fibrous substances such as paper and vegetation, but also for plastics and material with a low specific weight.

Ident. No.	Price
1443400	$ 372

M 20.1 Grinding chamber

A second grinding chamber ensures effective processing. The grinding chambers can be placed on the drive alternately.

Ident. No.	Price
8006200	$ 3,071

Removable, easy-to-clean, high-grade steel chamber

Double-walled grinding chamber

M 20 is suitable for low-loss, dry grinding of hard and brittle substances of up to 250 ml with a Mohs hardness of up to 9

MF 10 basic | **Microfine grinder**

Powerful drive

Easily interchangeable heads

Easy to clean working surface made of stainless steel

2+1 years after registering at www.ika.com/register

Continuously operating universal microfine grinder for impact and cutting grinding. Two different grinding heads can be attached to the drive and are easily interchangeable.

MF 10 basic | **Accessories**

1 MF 10.1 Cutting-grinding head

For crushing fibrous substances such as paper and vegetation, but also for plastics and material with a low volume weight. Before being discharged, the ground material passes through a sieve. This sieve is interchangeable and available in different hole sizes (not incl. with delivery). The ground material can then be collected using an NS 29 standard ground vessel.

Ident. No.	Price
2870900	$ 2,082

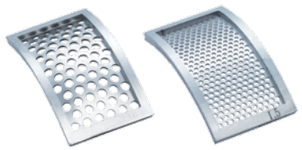
2 MF 10.2 Impact grinding head

For crushing brittle, hard materials such as minerals, building materials up to Mohs hardness 6. Before being discharged, the ground material passes through a sieve. This sieve is interchangeable and available in different hole sizes (not incl. with delivery). The ground material can then be collected using an NS 29 standard ground vessel.

Ident. No.	Price
2871000	$ 1,774

MF Sieve

Interchangeable sieves for insertion into the grinding heads ensure maximum particle size filtering.



Ident. No.		Price
2938900	MF 0.25	$ 342
2939000	MF 0.5	$ 342
2939200	MF 1.0	$ 342
2939400	MF 2.0	$ 342
2939500	MF 3.0	$ 342
2939600	MF 4.0	$ 579

IKA®+

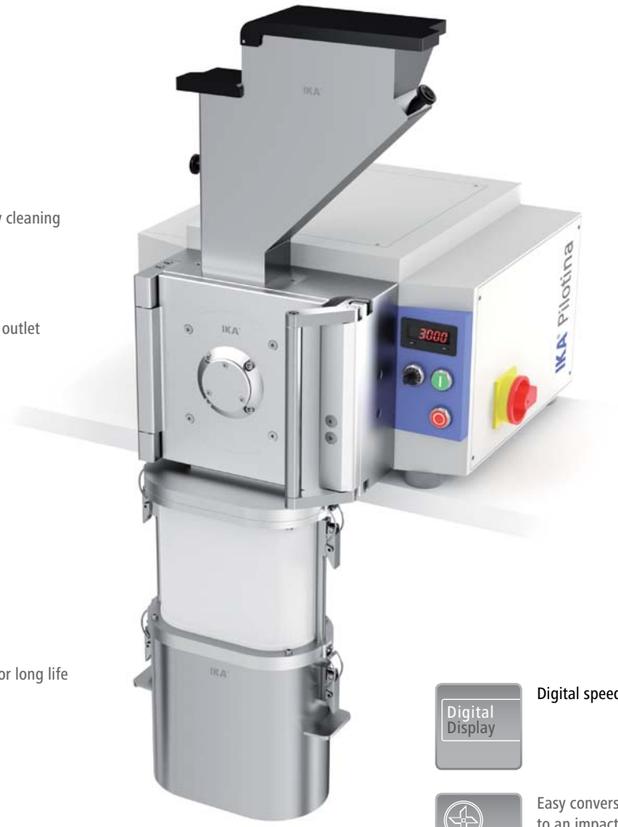
To get customized and additional accessories, please visit
www.ika.com/service

Pilotina | **Powerful and safe milling!**

Adjustable milling gap

Hygienic design for easy cleaning

Safe design of inlet and outlet



Powerful drive

Three-phase AC motor for long life and high power

Digital speed display

Easy conversion from a cutting mill to an impact mill

Easily interchangeable milling tools

IKA®+

Special safety features

> The mill will only start with the door closed
> It cannot be opened until the rotor reaches a standstill
> Safe design of inlet and outlet ensure that milling tools will not come into contact with the operator

Pilotina is a newly created pilot mill for grinding soft, elastic as well as hard and brittle materials. The modular design enables easy conversion from a cutting mill to an impact mill. The powerful drive provides ample power, even for ambitious applications. Due to easily interchangeable milling tools, the Pilotina is highly effective for a variety of applications.

Pilotina | **Accessories**

Pilotina MC – Cutting Mill

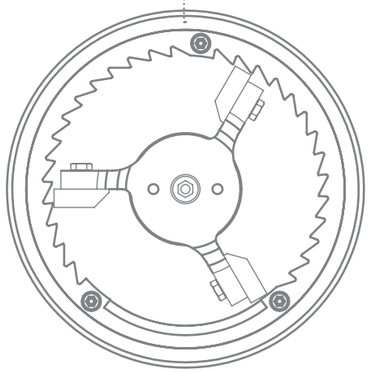
For crushing fibrous substances such as paper and vegetation, but also for plastics and material with a low volume weight. Before being discharged, the ground material passes through a sieve.

Ident. No.	Price
U106466	on request

Pilotina MI – Impact Mill

For crushing brittle, hard materials such as minerals, building materials up to Mohs hardness 6. Before being discharged, the ground material passes through a sieve.

Ident. No.	Price
U106465	on request

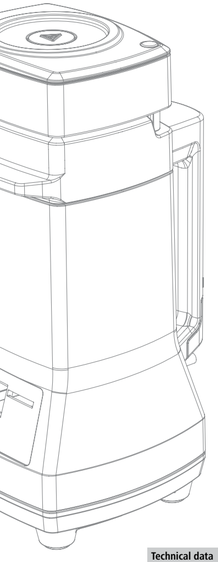


Sieves

Interchangeable sieves for insertion into the grinding heads ensure maximum particle size filtering. All sieves are made of stainless steel 1.4301.

Ident. No.		Price
U106468	0.12 mm	on request
U106469	0.25 mm	on request
U106470	0.5 mm	on request
U106471	0.75 mm	on request
U106590	1 mm	on request
U106472	2 mm	on request
U106473	3 mm	on request
U106474	4 mm	on request
U106475	8 mm	on request
U106476	10 mm	on request
U106477	20 mm	on request

Dry Mills | **Technical data**



Technical data	Tube Mill control	A 10 basic	A 10 basic	A 11 basic Analytical mill	M 20 Universal mill	MF 10 basic Microfine grinder drive MF 10.1 Cutting-grinding head | MF 10.2 Impact-grinding head	Pilotina Pilotina MC | Pilotina MI
Motor rating input/output	175 / 123 W	500 / 400 W	180 / 80 W	160 / 100 W	620 / 260 W	1000 / 500 W	3000 W
Speed range	5000 – 25,000 rpm	22,000 rpm (fixed)	20,000 rpm (fixed)	28,000 rpm (fixed)	20,000 rpm (fixed)	3000 – 6500 rpm	1500 – 4500 rpm
Speed display	digtal	no	no	no	no	no	digital
Useful volume	40 ml	50 ml	50 ml	80 ml (optional 250 ml)	250 ml	max. 5 kg/h	approx. 80 kg/h
Duty cycle (ON / OFF)	5 s – 3 min (timer)	10 min	5 / 10 min	1 / 10 min	7 / 10 min	120 / 30 min	non-stop operation
Overload protection	yes	yes	yes	yes	yes	yes	yes
Circumferential speed	65 m/s	63 m/s	57 m/s	53 m/s	72 m/s	22.5 m/s | 31.4 m/s	9 m/s | 34 m/s
Max. feed hardness	5 Mohs	9 Mohs	9 Mohs	9 Mohs	9 Mohs	3 Mohs | 6 Mohs	3 Mohs | 6 Mohs
Max. feed grain size	10 mm	6 mm	6 mm	10 mm	7 mm	15 mm | 10 mm	65 x 60 mm | 20 mm
Grinding chamber material	Transparent plastic (PP)	stainless steel (AISI 14301)	stainless steel (AISI 14301)	stainless steel (AISI 316L)	stainless steel (AISI 316L)	stainless steel (AISI 304)	Aluminum (AlSi10Mg)
Dimensions (W x D x H)	180 x 300 x 170 mm	130 x 145 x 250 mm	120 x 105 x 225 mm	85 x 85 x 240 mm	170 x 170 x 350 mm	320 x 300 x 560 mm | 320 x 300 x 450 mm	approx. 480 x 570 x 800 mm
Weight	2.7 kg	3.0 kg	2.2 kg	1.5 kg	6.6 kg	11.9 kg (incl. MF 10 basic)	approx. 70 kg
Permissible ambient temperature	5 – 40 °C	5 – 40 °C	5 – 40 °C	5 – 40 °C	5 – 40 °C	5 – 40 °C	5 – 35 °C
Permissible relative moisture	80%	80%	80%	80%	80%	80%	80%
Protection class acc. to DIN EN 60529	IP 30	IP 21	IP 21	IP 43	IP 21	IP 22	IP 55
Price	$ 1,639	on request	on request	$ 1,445	$ 4,176	$ 2,909 | MF 10.1: $ 2,082 | MF 10.2: $ 1,774	on request
	Ident. No. 4180001	Ident. No. 4020701	Ident. No. 1603501	Ident. No. 2900001	Ident. No. 1603603	Ident. No. 2836001 | MF 10.1: 2870900 | MF 10.2: 2871000	Ident. No. U106466 | U106465

MT 40 Disposable grinding chamber

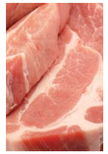
Price: $ 74 (10 pieces/pack)

Ident. No. 4425000

Selection Guide

		Batch Mills				Inline Mills			
		Tube Mill control	A 10 basic	A 11 basic	M 20	MF 10 basic + MF 10.1	MF 10 basic + MF 10.2	Pilotina MC	Pilotina MI
	Max. granularity of task	10 mm	6 mm	10 mm	7 mm	15 mm	10 mm	65 x 60 mm	20 mm
	Ultimate fineness*	1 – 100 µm	1 – 100 µm	1 – 100 µm	1 – 80 µm	< 0.25 mm	< 0.25 mm	> 0.2 mm	> 0.1 mm
Field	**Sample**								
Agriculture	Grains, seeds	✓	✓	✓	✓	✓	–	✓	–
Biology	Leaves, roots, stems	✓	·	·	·	–	–	–	–
Botany	Blossoms, flowers	✓	·	·	·	–	–	–	–
Brewery	Hop, malt pellets	✓	✓	✓	✓	✓	–	✓	–
Building Material Industry	Building materials	–	✓	✓	✓	–	✓	–	✓
Ceramic Industry	Ceramic	–	✓	✓	✓	–	✓	–	✓
Chemical Industry	Salt, molecular sieves	✓	✓	✓	✓	✓	✓	✓	✓
Cosmetics	Bees wax, collagen	·	–	–	–	✓	–	✓	–
Detergent Industry	Detergents, Mega pearls	✓	✓	✓	✓	✓	✓	✓	✓
Energy Industry	Coal, coke	✓	✓	✓	✓	✓	✓	✓	✓
Feed Industry	Animal feed	✓	✓	✓	✓	✓	✓	✓	✓
Food Industry	Rice, spices, bread, meet	✓	·	✓	·	–	–	–	–
Medical industry	Tablets, pills	✓	·	✓	·	–	✓	–	✓
Metallurgy	Ore, drill core	–	–	–	·	–	✓	–	✓
Paint and Varnish Industry	Color pigments, resin	✓	✓	✓	✓	✓	✓	✓	✓
Paper Industry	Paper, filter, cellulose	–	·	✓	·	✓	–	✓	–
Pharmacy	Vitamin tablets, tea leaves	✓	✓	✓	✓	✓	–	✓	–
Plastic Industry	Plastic, rubber	·	·	·	–	✓	–	✓	–
Tobacco Industry	Tobacco, cigarettes	✓	✓	✓	✓	✓	–	✓	–

✓ suitable – unsuitable · limited (Embrittlement of the sample) * depends on the sample



> Food

Rice
Meat
Maize
Spices
Wheat
Coffee beans

> Paper Industry

Paper
Filter
Fibres
Cellulose
Packing material

Applications & Industries


> Biology

Roots
Stems
Leaves
Tobacco
Fresh ginger
Seeds

> Pharmacy

Pastilles
Tea leaves
Glauber salt
Hawkbit roots
Calamus roots
Vitamin tablets


> Building Material Industry

Pebble stone
Granite
Ceramic
Concrete
Limestone
Silicon carbide
Medium density fiberboard (MDF)

> Plastic Industry

Acrylate
Elastomer
Plastic PA
Plastic PS
Plastic mixture
Rubber

> Chemical Industry

Salt
Calcium carbonate
Active carbon
Raney nickel alloy
Silver chloride

> Paint and varnish Industry

Titanium dioxide
Printing ink
Powder lacquer
Ferric oxide pigment
Watercolors
Color pigments

> Medical Industry

Enzyme powder
Piroxicam capsules
Tablets
Placebo granules
Uzera dragees
Ibuprofen


> Energy Industry

Coal
Coke
Oil shale
Anthracite
Hack-shipping
Wood pellets

> Cosmetics

Collagen
Bees wax
Color pigments
Paraffin wax
Wax sequins

Knowledge | Grinding material properties

IKA® mills can be used for the grinding of soft, hard, brittle, fibrous and elastic materials. The grinding of solid samples is essential to ensure precise analysis. It is important that the grinding leads to the homogeneity and desired fineness of the sample. The type of mill to be used depends on the properties of the substance and the quantity of the sample. For example, brittle materials are ground with a beater, fibrous materials with a blade, and hard/brittle materials are ground with a special hard metal cutter.

Below are the examples

Soft: Meat, pastilles, cheese, tissue…
Hard: Coal, coke, maize, salt…
Brittle: Stones, glass, ceramic, concrete…
Fibrous: Leaves, paper, wheat, grass
Elastic: Rubber, plastic, elastomer, gummy bears…

Small sample quantities are generally ground with a batch mill. Here, a particle size spectrum of the ground material can be expected. Larger quantities can be ground with an inline mill. Here, the sample passes through a sieve, which leads to the ground material achieving a defined particle size.

Problems can arise when soft and tough materials such as rubber or plastics have to be ground. The problem can be solved through the embrittlement of the sample with dry ice or liquid nitrogen. The sample can then be ground without difficulty.

Choose beaters/cutters from the selection guide below to suit your application needs

Beaters/Cutters selection guide

IKA® device	Beaters / Cutters	Soft	Hard	Brittle	Fibrous	Elastic
A 11 basic	A 11.1 Spare beater	·	·	✓	–	·
	A 11.2 Cutting blade	·	–	–	✓	·
	A 11.3 Beater	·	✓	✓	–	·
	A 11.6 Double beater	·	–	✓	–	·
A 10 basic	A 14 Spare cutter	·	·	✓	–	·
	A 15 Hard metal cutter	·	✓	✓	–	·
	A 17 Star-shaped cutter	·	–	–	✓	·
M 20 Universal mill	M 21 Spare cutter	·	·	✓	–	·
	M 22 Hard metal cutter	·	✓	✓	–	·
	M 23 Star-shaped cutter	·	–	–	✓	·
MF 10 basic	MF 10.1 Cutting-grinding head	✓	–	–	✓	✓
	MF 10.2 Impact grinding head	–	✓	✓	–	–
Pilotina	Pilotina MC – Cutting Mill	✓	–	–	✓	✓
	Pilotina MI – Impact Mill	–	✓	✓	–	–

✓ suitable – unsuitable · limited

IKA®+

Sample Preparation!

Send us your sample and we will process and analyze it for you within 48 hours!

Send your sample with a data sheet to:
IKA-Werke GmbH & Co. KG,
Janke & Kunkel-Str. 10,
79219 Staufen, Germany.

Data sheet download: **www.ika.com**

IKA® offers more

labworldsoft®

IKA® laboratory software labworldsoft® is an advanced software for all your laboratory needs. With the help of this software, you can network up to 64 laboratory devices via one PC. All test parameters can be documented ensuring complete automation of your laboratory experiments. Measurements and processes may be run independently. Long waits and processing times are reduced, which increases productivity.

Comprehensive Worldwide Service!

Our dedicated team of engineers provides comprehensive worldwide technical service. Please feel free to contact your dealers or IKA® directly in case of any service queries. Hotline: In the event of an equipment malfunction or technical questions regarding devices and spare parts:
call +1 800 733-3037

IKA® Application Support

Our Application Center spans 400 sqm and offers modern facilities for presenting and testing lab devices and processes. This brings us even closer to our customers and improves our service. Here, prospective buyers and customers can test out processes that involve stirring, shaking, dispersing, grinding, heating, analyzing and distilling. In addition, it also further extends the opportunity to test your own devices and to develop new models.

FAQ

What is the difference between a batch and an inline mill?
Batch: working with a default volume
Inline: continuous sample feeding.

Is it possible to grind liquid nitrogen frozen samples?
It is possible to pre-cool the samples in liquid nitrogen, but in the mill chamber there should not be any liquid nitrogen. With the A 11, the sample can be pre-cooled directly in the ETFE grinding chamber. In A 10 and M 20 mills, the grinding chamber can be rinsed with liquid nitrogen for pre-cooling.

How is it possible to get chromium contamination when working with the A 10, A 11 or M 20?
Knives and mill chamber are made of Cr-Ni stainless steel. There may always be fine or superfine abrasion in the milling process.

How long do I have to grind my sample in an IKA® mill to get the best results?
Depending on the sample, 20 seconds could be enough. In general, after 60 seconds there is no particle reduction taking place; only the application of energy and the sample getting increasingly warmer.

How to cool my sample most effectively for milling?
Pre-cooling with iced carbon (or liquid nitrogen) is reasonable for samples containing oil or for elastic samples. With iced carbon, it is even possible to pre-cool directly in the milling chamber. But all iced carbon should be evaporated completely before the milling process.

I would like to crush very hard materials. IKA® mills are suitable for up to what Mohs hardness?
In general, all of our mills can manage a Mohs hardness of about 5 – 6. But for the A 10, A 11 and M 20 there is a hard metal beater available that is suitable for samples up to a Mohs hardness of 9.

Is it possible to sterilize IKA® mills?
The grinding chamber of the A 11 and the knives of the A 10, A 11, M 20 as well as the grinding head of the MF 10 can be autoclaved. The drives of all mills can only be treated with an Isopropanol wet cloth while the shaft feed can only be cleaned and sterilized with a solvent wet cloth.

Can the M 20 or the A 10 be cooled via the hoses with ethanol or liquid nitrogen?
No, the cooling hoses are only suitable for cooling with water.

Please visit
www.ika.com

IKA®+

Application Support!

For questions regarding applications and processes, you can call our hotline number:
+1 800 733-3037*
E-Mail: sales@ika.net

* Monday – Friday from 8:00 am - 5:00 pm

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Subject to alteration of prices
Subject to technical changes

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designed
to work perfectly