General instructions

Grinding room B1.008

Safety

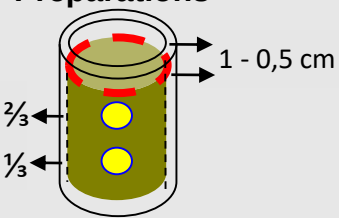
- It`s required to have a **operation and safety instruction** to use the grinding room B1.008 and its devices!
- Wear **ear protection** when drying the grinding cups with compressed air! (noise protection)
- Take care compressed air could cause damage to your eyes (danger of blindness). Don`t let the compressed air device point into your eyes!

Note

- please use to the calendar (at the door) to **book the grinding room** (devices and ball mills)
- Use the **fume hood** for all dusty work and keep the hood closed as far as possible.
- Clean the workspace & equipment and tidy up before you leave. If necessary use the vacuum.
- Please **label all your sample boxes!**
- Something is unclear, you have questions or things are broken, ask/inform your supervisor or Iris Kuhlmann (Tel . 6162; B2.006).

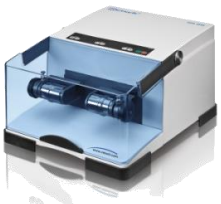
How to grind your samples:

Preparations



- fill 1/3 of the cup with sample material → place the first ball → fill up with sample material to 2/3 → place the second ball on top
- do not fill the cups completely (leave 1-0,5 cm space till the lip)
- if you have a small amount of sample : use only one ball
- final grain size: down to 1 µm can be achieved, depending on the grinding time

Grinding



*! beech and oak wood dust is **carcinogenic**, therefore put on a breathing mask [type P3] during grinding beech/oak wood !*

→ Both milling positions must be loaded with approximately the same mass

- <u>place the grinding cups in a vise:</u> *place the grinding cups into the center of the clamping device and secure*
- <u>start the grinding process:</u> *Shut the hood → Set the frequency → Set the time → press **START** button (time is recorded and the remaining time is shown in display)*
- <u>stop the grinding process:</u> *Press the **STOP** button (pressing once interrupts the grinding process - by repressing the start button the mill continues the run, pressing the stop button twice stops the grinding process)*

Cleaning

- clean the cups and grinding balls with deionized water, a bottle brush and sea sand. *(case of heavy residue: use sea sand and grind 5 min at 30 Hz)*
- use a bowl to prevent the balls from disappearing down the drain or breakage
- Use ear protection (noise protection) while working with compressed air

Iris Kuhlmann & Jessica Heublein, 02.2016

Instruction manual

Mixer Mill „MM 400“ Retsch

Inserting / replacing the milling cups:

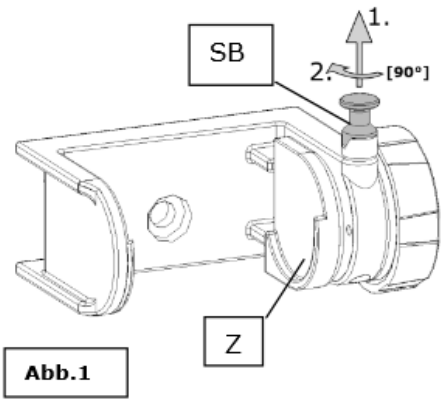


Abb.1

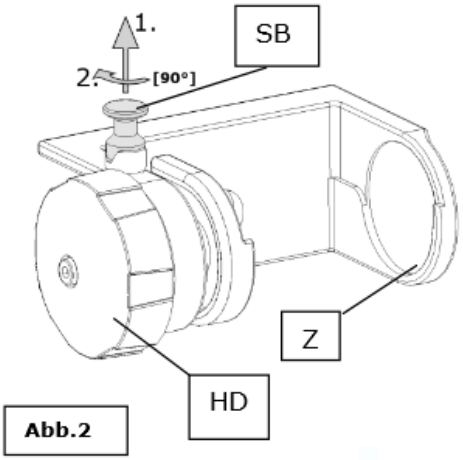


Abb.2

Place the milling cups, filled with the material to be milled and the milling balls, into the centering points **Z** of the clamping device and clamp firmly. **Fig.1/2**

- Remove the locking pin **SB** upwards from the groove and turn through 90°. **Fig.1/2**

This unlocks the locking device.

- Turn the handwheel **HD** counterclockwise until the max. clamping range is reached. **Fig.1/2**
- Turn the locking pin **SB** back through 90° until it engages in the groove again.
- Insert milling cup and press lightly into the centering point **Z**
- Turn the handwheel **HD** clockwise with two fingers until the milling cup just fits, free of play, in the holder. Then continue to turn the handwheel clockwise through 6 – 8 easily audible “clicks”, while at the same time the locking pin **SB** is raised and lowered with clearly audible “clicks”.

The engaged locking pin reliably prevents automatic opening of the milling cup holder.
If the locking pin **SB** cannot be pulled upwards to release it, unlocking should not be forced with a hammer or similar tool. **Otherwise the hardened locking pin can break off.**
Briefly retension the handwheel **HD** in the clockwise direction – the locking pin can then move freely again.

To remove the milling cup lift the locking pin and turn the handwheel in the opposite direction to tighten.

How to adapt the setting / start or stop the machine:

Display and operating unit

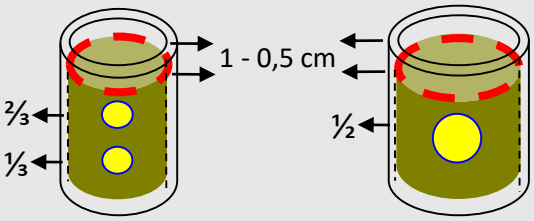
1 Memory, operating mode and stand-by
2 Frequency display
3 Time display
4 Start and Stop button
5

1 → **PROG** calls the stored programs; **SET** stores the set milling parameters
2 → Frequency 3 to 30 Hz possible (adapt by per pressing the minus or plus button). Continuous pressing switches on the digits fast running.
3 → Setting range 10 sec to 99 min (adapt by per pressing the minus or plus button). Continuous pressing switches on the digits fast running.
4 → Starts the milling operation
5 → Interrupts or ends the milling operation

Iris Kuhlmann & Jessica Heublein, 01.2019

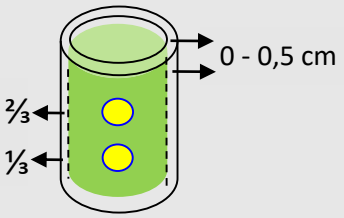
Grinding different material

soil samples



- depending on the sample amount use small or big grinding cups (with small grinding cups you will achieve satisfactory grinding results much faster)
- do not fill the cups completely (leave 1-0,5 cm space till the lip)
- if you have a small amount of sample: use only <u>one</u> ball

plant samples



- use small grinding cups
- if you have a small amount of sample: use only one ball
- final grain size: down to 1 µm can be achieved, depending on the grinding time
- in case of very resinous or fibrous material it could help to deep freeze your sample with liquid nitrogen or with dry ice before grinding.

→ Just grind as long as necessary!

(final grain size: down to 1 µm can be achieved, depending on the grinding time)

<u>Grinding:</u>

- grind till a powder-like material is achieved
- dry **3 min at 25 Hz** for “normal” soils
- silicate enriched soils have to be grind a bit longer but with less material (max. 2 x 4 min).

- grind till a powder-like material is achieved
- dry **3 – 4 min at 23 Hz**

*! beech and oak wood dust is **carcinogenic**, therefore put on a breathing mask [type P3] during grinding beech/oak wood !*

→ Both milling positions must be loaded with approximately the same mass!

(if you have only one cup left use an empty cup **<u>without a ball</u>** as counterbalance)

<u>Cleaning:</u>

- clean the cups and grinding balls with deionized water, a bottle brush and sea sand. *(case of heavy residue: use sea sand and grind 5 min at 30 Hz)*
- use a bowl to prevent the balls from disappearing down the drain or breakage
- dry cups and balls with compressed air (Use ear protection!)

Special procedure for 14C sample grinding

→ Use 500°C baked glassware to store your samples!

- to clean the grinding cups from any residues use sea sand and grind 3 min at 30 Hz
- cover the working place with aluminum foil and use isopropanol to clean the foil
- use weighing paper to transfer your samples in glasses, clean it with isopropanol before and use a new one for each sample
- clean all instruments (spattle, scissors etc.) with isopropanol for each sample
- wash the grinding cups with deionized water, a bottle brush and sea sand and rinse cups and balls with isopropanol afterwards

<u>Safety:</u> isopropanol has skin-irritating effects to mucous membranes; therefore avoid any contact with skin, eyes and clothes. When dealing openly with isopropanol wear **StarGuard® Protect+** lab gloves.

Iris Kuhlmann & Jessica Heublein, 02.2023

Instruction manual

Fume hood B1.008

General information:

motion detector

A motion detector on top of the fume hood, registers movement within a radius of 1.5 m. The fume hood closes automatically after 10 minutes, if no movement is detected.

light barrier in the sash

A light barrier in the sash registers objects sticking out of the hood, thus preventing the shutdown of the window.

Never seal or manipulate the motion detector or the light barrier in order to prevent the shutdown!

Control panel:

Malfunction

- **red light** turns on and alarm sound appears, press QUIT.
- in case of persistent malfunction, tell your supervisor, Iris Kuhlmann (Tel . 6162; B2.006) or the house technician for help.

Operational

- green light **[ON]** has to be active

Vmax

- In case of high dust development, the air flow exchange can be increased.
- Close fume hood and press the [**Vmax**] button for a few seconds.
- Press the [**Vmax**] button again in order to reduce the air flow exchange to normal level before you leave.

Iris Kuhlmann & Jessica Heublein, 01.2019