



Homberg + Brusius e.K., Germany
Auf der Lay 31, D- 55743 Kirschweiler, Tel. +49 6781 35036,
mail@homberg-und-brusius.de

01/26

Manual Spirator-3,5 (Spi-3,5)

For grinding, polishing, washing, deburring, derusting, matting, mixing, colouring and plating of objects/materials of various types and from small to around 9cm large, e.g. items of jewellery, byouterie pieces, stamped items, stones (precious or non-precious as well as those from collectors such as rolled river rocks, amber etc.). Furthermore, pieces of glass, ceramic, wood (colouring), rubber (coating with talcum), plastic (deburring) etc.

The correct operation of the machine is very important in order to achieve the best possible results in a reasonable period. Please take enough time to read these operating instructions carefully from start to finish. (Possibly note the points that are important to you with a red pen). The following document particularly goes over the preparation of stones = from precious stones to already naturally rolled "pebbles".

The container of the H+B 3.5 litre tumbler is made of a special rubber, and is suitable for many different grinding and polishing powders. This container has a work capacity of 3,5 Litre for max. 4,5 kg stones. When filled it has a volume of 73 db, if you stay near the machine. One metre in between it has 65 db ...

This machine functions through vibration. Quiet and fast. Each filled part to be processed is constantly moving. This machine can be connected to 220/230Volt 50Hz alternating current (= usually the normal household grid).

PLACING THE MACHINE CORRECTLY:

Look for a dry, clean, well ventilated, stable and flat space for this machine. A somewhat rough, non-slip surface would be ideal to avoid any possible "wandering" of the machine. If it is to stand elevated (e.g. on a table) then, for reasons of safety, you should put four blocks on the planned surface around the feet of the machine, in order to avoid any possible wandering of the machine.

Very important to read:

PUT ON AND MOUNT THE CONTAINER CORRECTLY (important periodically):

First of all, note the information about the container at the end of this manual. Last paragraph.

If you need to remove the container first unscrew the plastic lock button (rubber nut) at the top of the container lid by turning it counter-clockwise. Now remove the lid. Use e.g. a screwdriver or a blunt knife for assistance. Unscrew the M8 nut which sits on the threaded rod. To get started you can use a wrench (size SW13mm) to help you, and then continue turning by hand (in a counter-clockwise direction). Now remove the U disk (washer). Then you can lift the container off.

Look carefully at the exterior of the container floor: You can see four depressions. Then lift the now visible black rubber mat up (important: This mat must always lie between the screw head and the container): Here you will discover 4 screw heads. Here one thing is very important: The depressions in the floor of the container are intended for these screw heads. When you put the container back on make sure that these depressions (notches) fit or are placed exactly on the screw heads when the container is fitted again. After the replacement of the container, again place the U disk over the threaded rod on the container and screw on the M8 nut. First tighten it by hand and afterwards with a wrench (size SW13mm) for 1.5 more rotations. (Don't tighten it so much that the nut won't be able to come off again, but also not so loose that the container wanders around. If the container does wander then tighten the nut a little more.) After filling you can put the lid on. For this please ensure that it sits in the correct depression (see last paragraph of the instructions).

OPERATION: WASHING, GRINDING AND POLISHING OF THE STONES.

We work the stones with silicon carbide (abbreviated to SiC) grinding powder with the grit sizes 80, 220, 400 or 800 and with our well-known polishing powder **X-3** (which is suitable for *almost* all stones). Talk to us. We are happy to let you know the right polishing powder for your stones.

Option: Addition of grinding media and a special granulate or plastic polishing media.

1) The stones: It is recommended to fill with stones of differing sizes. The more small stones are included (even those which are only the size of a small fingernail), the more friction surfaces you have, and in addition to this they can easily reach into any concave surfaces on the other stones. It is also possible, instead of these small stones to fill with our so-called abrasives (pellets from around 1-2 cm size), which reach any uneven parts of the objects to be ground particularly well due to their shape! If you ever want to fill with large stones then it is better to only add 3 pieces (of a maximum length of 7 or 8 cm) into a mixture of many small stones. During running always pay attention to the completely free and vigorous movement and circulation in the container! The larger stones should not (mutually) block themselves.

(If you insert already rolled/rounded stones then by all means a length of 8 to 9 cm and up to around 5cm thickness is possible). However you should observe the effect in the running machine over a longer period of time, and precisely at the start you should check a lot/more often, react/make changes if necessary, make notes and find out/establish what the best working method is for you.

2) Before you fill in your stone pieces they must be washed. The new container on the new machine can this time remain mounted on the machine because it is clean. (To be safe however, check with a wrench / spanner of size SW13 (= for M8) that the six edged nut on the inner container cone (= under the container lid) is really screwed on tightly. When you do this, you will simultaneously get a feeling for "how tight" this nut should be, because it must not be too tight either, to prevent the central container cone from being pressed down deeper.

The stones are wetted with water, for example using a spray bottle. No water must accumulate at the bottom of the container!

3) The filling of the container occurs as follows:

Fill the wet washed stones into the container. (If possible stones of around the same hardness - if this is not known then note this later "yourself" through regular observation! If certain stones decrease in circumference too quickly, they are soft. Remove them in good time and save them for later processing in the next finer grit size, or collect these stones for a separate, full container load. Fill the container at least up to half the height of the inner container cone (= the raised part in the middle of the container), or even better higher (this provides weight and pressure) up to just below the surface of the central cone. Do not fill so few stones that they only rotate on the bottom instead of tumbling from the bottom to the top (falling from the outer wall inwards). Also, no stones should constantly hit the lid. For good movement, a good mix of stone sizes (large, medium, small) is also important. Because good movement ensures good grinding.

Positioning and fixing the lid:

Once the lid is properly seated in the container, place the rubber washer on top, followed by the metal washer, and finally secure everything with the star nut. Do not overtighten, but ensure it is not so loose that it comes undone and allows the lid to rotate! Please also note the information regarding the container at the very bottom of these instructions.

The following information is intended for a maximum filling of the 3.5 litre tumbler container with raw stones.

4 a) FIRST GRINDING = 1st day (first 8-10 hours course in grit 80)

a) Sprinkle 30 ml of SiC grit 80 with the measuring cup, or a lightly heaped tablespoon, over the wet stones. Put the container lid on.

Put the machine plug in the power point with dry hands and turn ON the machine at the switch. This course should be for the first 12 hours.

Before you move away, observe for a short time whether everything is running properly: Lively movement of all stones and a circulation from outside to inside. The container itself must sit snugly on the machine and must never independently turn on the machine.

Check again **after 2 to 3 hours**. Now all stones should be covered with a thin layer of grinding sludge. If the grinding slurry is a bit too thick, turn off the machine, open the lid, and spray a little moisture with the spray bottle. Or you can take the enclosed measuring cup and add approx. 20–30 ml. If necessary, repeat this process but add even less water this time. Put the lid back on and tighten the plastic nut.

After about 20 minutes, check whether the grinding slurry is a bit more liquid again and if the stones are now moving vividly. If you notice that the stones come up without grinding slurry, i.e., "bare", you have too much water in the container. The water sits at the bottom of the container and washes the (too thin) grinding slurry off the stones, so that no grinding effect can occur. It can happen that stones knock against the inside of the underside of the lid. If it only happens now and then and it doesn't bother you, that's not a problem and you don't need to do anything. However, if it knocks constantly, it means that too many stones have been filled in. The tumbling movement cannot unfold freely, and a few stones must be removed.

4 b) After the first 8–10 hours

Still grinding with grit 80, but with fresh grinding grit

Before the fresh grit can be sprinkled in, everything needs to be cleaned a little. Add about two measuring cups full of water to the container and let the machine run briefly (approx. 4-5 minutes). This softens the grinding slurry slightly, making everything easier to clean. Then turn the machine OFF with dry hands and pull the Schuko plug out of the socket. Remove the container: unscrew the rubber nut, remove the lid, loosen and unscrew the M8 nut on the container cone using a wrench (size 13 mm), and take off the container.

Carefully pour the entire contents of the container into a sieve that is placed in a collection tray. Rinse the inside of the container and pour it over the stones in the sieve. This does not need to be done "thoroughly" because we are using the same grit size again. Feel free to look closely at the surfaces of some stones to learn what the progress looks like (as you will notice that at some point, no further progress can be detected with the same powder grit, and you will therefore have to switch to a finer powder). Fill the wet stones into the container and carry out all the necessary steps as described further above so that a new working cycle can begin.

The grinding process with grit 80 is very important and should be repeated several times so that a beautiful polish can be seen at all. Grit 80 ensures that the stone gets a surface that is as closed as possible, with hardly any pores remaining (however, there are also pores and holes that are too deep to be closed at this stage). If the surface is not sufficiently closed, the polish shine will be disrupted by the open pores later on. As a result, the final outcome will look as if the stone was not polished properly. However, the reason for this lies in the initial grind with grit 80.

5) BETWEEN EVERY GRIT CHANGE (so from e.g. 80 to 220 etc.) it is recommended to, after the washing (as described in 4c - but this time thoroughly!) to carry out an additional washing cycle of around 20 minutes in the tumbler. This process operates like grinding: Container wet inside, stones wet and already sprinkle about 30 ml of the planned finer grit and let this

run for one hour in the machine. Then pour out, carefully wash everything again and brush out the inside of the container again. (This intensive cleaning work can be avoided by purchasing an extra container per grinding and polishing grit.)

5) Cleaning BETWEEN EACH GRIT CHANGE (e.g. from grit 80 to 220, etc.), it is very important to clean very thoroughly

6) THE FINAL PROCESS is POLISHING. For this, a separate container "for polishing only" is advisable! If not available, clean the container and stones EXTREMELY CAREFULLY.

The best polishing powder for polishing in the Spirator is our popular X-3:

- Sprinkle 30 ml of our X-3 (it is suitable for almost all stones. Other available polishing powders for special stone types are Titanium and Cerium Oxide).
- Let it run for 8–10 hours.
- Check and dilute any grinding slurry that is too thick with water.
- Refresh as described above and let it run for another 8–10 hours.
- Check the stones. Polish already achieved? If not, continue as before and keep checking, **as the polish can usually be achieved in just one day.**

Approximate guideline for angular rough stones (varies depending on stone hardness):

- 3 days SiC 80
- 2 days SiC 220
- 2 days SiC 400
- 2 days SiC 800
- 1–2 days polishing powder

Working WITH ALREADY ROUNDED, PEBBLED STONES e.g. pebbles (river pebbles, beach stones...)

Here, the entire process is kept significantly shorter. Fill the container ONLY with pebbles, no rough, angular stones.

Here we can recommend the following approximate working method:

- 3 days with SiC 80
- 2 days with SiC 800
- 1 day with **X-3** polishing powder

Just like with rough stones, there are also types of stones among these that do not polish well in the machine. These are usually particularly soft. You can sort out such stones and save them until enough of this type have accumulated to fill a container. These can be polished with an additional "special granulate" (available from us), in addition to the polishing powder. This prevents the stones from rubbing directly against each other, as this rubbing keeps them matte.

See the description for SOFT STONES further below. Individual stones can also be repolished by hand on a felt (our "Politex") with X-3 polishing powder.

Flat stones:

If (small) serrated sheets (e.g. for pendants) or other objects with a face are filled then there is a danger that these stone faces could "suck on/stick" to one another or small slices stick to the container wall. In order to avoid this enough small, already well ground or polished stones should be filled in with them (ratio of slices: Addition 1:1) so that a couple of these stones always "have to" sit between these stones. If you don't have any such small and flat stones then we recommend you our abrasive FINE.

Working WITH AMBER is completely different because this material is so light. We recommend adding small tumbled stones in addition to the amber load and the grinding or polishing powder, or, if these are not available, using our grinding/polishing MEDIA in a 1:1 ratio to generate weight, pressure, and movement.

SOFT STONES can be difficult.

We recommend adding our special granulate or our plastic polishing media during polishing so that the stones/objects do not rub each other matte. Use 1.5 kg of granulate and a maximum of 1 kg of stones, so that the stones do not constantly bump into each other and keep each other matte.

We will be happy to send you our separate instructions for this.

Note your experiences. Good ones and less good ones. These can be useful for you later on. Collect your experiences.

USE OF THE ABRASIVES and ADDITIVES

In the course of time you are welcome to vary the powder types / amounts and grinding duration etc. at your discretion, i.e. experimenting in order to achieve better or faster results can be very successful.

The water amounts added are always dependant on the amount and the size of the stones added and any additional abrasives. Many small parts create more surface to be dampened ... than ... less and larger stones. Therefore here also experience will guide you.

MAINTENANCE: Always keep your machine and its surroundings clean. Once a month check (with the machine turned OFF and the plug pulled out of the power point), with lifted container and removed rubber washer, that the M8 nut on the threaded rod (directly on top of the top of the machine) is firm. For this use a wrench of the size SW13. (Hold the upper part of the machine tightly and with the other hand turn the M8 nut clockwise tightly with the wrench, i.e. you are trying to tighten this as it is highly probable that it will never release itself.

(If at any stage later this nut has released a little and you can't tighten it, i.e. it can always be turned further clockwise then you should not use the machine anymore. This means that it is only able to be set if the lock nut under the steel plate, so in the housing, is "held". This should only be done by a specialist.) If your rubber washer is worn you can get a new rubber washer.

POWDER DISPOSAL: The small amounts of powder and stone dust that you sometimes have left over (every 24 hours) is hardly worth keeping for re-use. Therefore we recommend that you store this, e.g. in a (cut open) milk carton and at some stage when enough has been collected and the water has evaporated or been poured out you can dispose of it (in Germany: household waste). If the use differs from the above, the the appropriate code is selected by the user (Regulations of the respective countries).

Disposal: The machine is durable. If the engine is defective, it is detached from the machine and replaced. Otherwise, it belongs to the disposal of electrical appliances.

The rubber container for Spirator-3,5

If the container has blemishes /outside/inside or on the edge), it does not affect its function and durability. This is unavoidable when producing a rubber container. They are optical in nature and do not interfere with function.

It can happen that the container-3.5, during transport, by lateral pressure, is slightly deformed, so no longer looks really round. This is easy to fix as follows:

Place the container in a warm room for a few hours or a day (do not try to heat the container differently) so that it can be brought back to its original round shape a little softer and therefore easier. Then insert the lid and leave it in for a period of time.

It may be that new lids from us (on both sides) are protected against scratches by a film. Peel off this foil (possibly with the help of a tape piece, which you attach to the edge. Hold the protruding Tesa part and pull it off with a jerk upwards).

Place the Plexi lid in the container. This may seem "impossible" with slightly deformed containers, but please proceed as follows (do the same with a nicely round-looking container, but where you do not get the lid in so easily and think that it would be too big):

Place the container on a table and place the lid on top, with one side (obliquely) in the intended container edge.

With one hand, push the lid down where it was inserted. With the other hand, take the flat stem of an (old) teaspoon and place it exactly under the lid where it does not want to sag into its intended container edge.

Inexorably keep the pressure (on the lid) down with one hand. Meanwhile, guide/slide the dipperstick through the edge of the container. The lid will, due to its vigorously applied pressure, follow the spoon handle piece by piece downwards (into the edge of the container). Once you have driven around completely, the lid is in the edge.

If the lid is seated, i.e. completely locked into the edge of the container, leave it (in a warm environment) so that the container regains its round shape and the lid then fits in appropriately.

Warning: Do not use sharp objects (e.g. knives, screwdrivers, etc.) that could injure you.

Once the lid is properly seated in the container, place the rubber washer on top, followed by the metal washer, and finally secure everything with the star nut. Do not overtighten, but ensure it is not so loose that it comes undone and allows the lid to rotate.

Warnings:

- Read the operating instructions carefully and observe all safety instructions! Check that the information on the label matches your power supply. The machine / equipment must not be exposed to the weather or stand in a damp room and must not stand/run with flammable liquids or gases.
- Lift the machine only by the lower housing. Do not lift it by the container!
- Do not place the machine and cable on heat sources (e.g. stove, heater).
- Unplug the power outlet when the machine is not in use
- if the machine "moves", please check, with the machine switched off and the plug pulled out, whether the threaded rod is firmly seated on the upper part of the machine (see note under "Care!") and whether the container with its lower 4 recesses has been correctly placed over the 4 screw heads.
- Very important: The container must be firmly screwed for the operation and must never rotate on the machine!

- If it smells burnt, immediately turn OFF the machine and unplug it from the socket. Determine if the smell comes from this machine or if it is due to the socket. Have it checked by a specialist (electrician).
- Do not use multiple sockets.
- Do not use extension cables.
- Plug into grounded socket only.
- Only pull the plug out of the socket with dry hands or plug the plug into the socket!
- Do not pull the machine on the cable.
- Do not use the machine if the power cord or plug is damaged, the machine is not working properly, has fallen or is otherwise damaged.
- We recommend a DI personal protection adapter plug, which switches off the current in fractions of milliseconds in the event of a short circuit, for example.
- Keep the machine clean. Do not clean the machine in a water bath.
- When cleaning the container, remove the container.
- Do not work with aggressive soaps or agents that could attack the container material.
- Never try to open/remove the lid while the machine is running.
- In the presence of children, always keep children under supervision.
- Use the machine out of the reach of pets.
- Do not run the machine in a closed cabinet/box. Don't put anything over it.
- Do not place the machine in a tub/box.
- The engine needs cooling and the upper part of the machine must be able to vibrate freely.
- Do not move or carry back and forth while running.
- Place the machine only on a straight, solid floor or table.
- In case of unknown / disturbing noises that you cannot assign: Switch off the machine and use it again only after clarification.
- Use only suitable tools and do not make do with unsuitable or sharp aids. These could cause accidents or injuries.

We wish you a lot of pleasure. H+B Team

EU-Certificate of Conformity



Homberg + Brusius e.K.

Auf der Lay 31, D-55743 Kirschweiler,

mail@homberg-und-brusius.de

Tel. +49 6781 35036

Germany

Grinding-/Polishingmachine Spirator-3,5 Spi - 3,5

AC 230V, 50Hz, 55 Watts, Shaded-pole motor, 2600 rpm,

65 db when filled with 4,5kg (semi-) precious stones.

Max. payload 4,5kg

**The machine is herewith declared to conform with the following guidelines
Machine guidelines 2006/42/EU**

Measured value of the protective resistance - 0,1 Ohm (limit value 0,3 Ohm)

Kirschweiler, 2018

Kitty Homberg, Owner