STANDARD OPERATING PROCEDURE

Mill, Burr

Model: DK-15LS
Manufacturer: Mahlkonig GmbH & Company KG/Mahlkonig USA
Location: Dry Processing Pilot Plant, 1851 Food Sciences Building
Publication Date: 04/30/2015
Description and Uses

The Mahlkonig grinder is designed to provide fine and efficient grinding of coffee, grains and other materials. It has a hopper capacity of 66 lb and a grinding capacity of 265-285 lb/hr for fine and medium grinding of feed materials. The mill is also equipped with a sliding lock plate to interrupt feeding of the product being ground, as well as integrated hopper magnets to protect against ferrous-metal fragments ending up in the product. The grinder’s outlet has a tight discharge chute for dust-reduced grinding. Other features of the grinder are:

• Service-free, continually greased bearings
• Motor protection against electrical overload
• Wear resistant, precision grinding discs for careful cutting of the material
• Precise, accurately repeatable control of the degree of grinding fineness

Power Specifications

Motor: TYP DK-15LS
Power/Wattage: 2200 W
Voltage/Amperage: 208-220V/10A
Capacity/Frequency: 265-285 lb/hr @ 60 Hz

Potential Hazards and Safety Precautions

High Voltage (208-220 V)/Electric Shock

• Make sure that the wall outlet receptacle is properly wired and grounded, and matches the instrument’s power cord and plug.

• Make sure the area around the outlet, floor and your hands are completely dry when handling electrical cables and plugging or unplugging the electrical cord to/from the outlet.

Sharp, Rotating Grinding Surfaces/Abrasions, Cuts, or Severed Body Parts

• Keep hands and other body parts away from the mill’s grinding services.

• Do not insert hands or other body parts into the narrow neck of the mill’s feed funnel (hopper), or into the opening of the discharge chute located below the grinding discs.
Mechanical Pinch Points/Possible Entanglement of Extremities, Hair, Jewelry or Clothing

• When operating the mill, secure long hair against possible entanglement by wearing a hair net.
• Do not wear loose-fitting clothing or “dangling” jewelry (bracelets, necklaces, etc.) that may get caught in moving parts and cause injury, or rings and watches that may fall into the hopper during operation, as they will be broken or ground beyond use, and could cause damage to the mill.
• Do not use any tools to assist product flow through the hopper, as this can result in serious operator injury and damage to the mill.
• Nothing, except the material for which the mill is intended to grind, should ever be placed into the hopper while the mill is running.

Flying Debris/Potential Eye Damage

• Do not operate the mill without wearing all required personal protective equipment, including safety goggles.

Fire Safety/Possible Fire or Explosion Hazard

• Do not use the grinder with materials capable of developing flammable or explosive vapors.
• Do not use the mill near open flames or devices that can generate sparks.
• Depending on the material being ground, operation may involve occasional generation of fine dust particles which can pose a fire or explosion hazard.

Biological Safety/ Dust Inhalation and Possible Lung or Respiratory Damage

• Depending on the material being ground, operation may involve occasional generation of fine dust particles which may pose an inhalation hazard.
• Always wear an approved dust mask when operating the mill.

Required Personal Protective Equipment

Lab Coat
Hair Net (Tie Back Long Hair)
Safety Glasses or Goggles
Long Pants and Sleeves (Tightly Secured)
Rubber Gloves
No Loose Fitting Clothing
Dust Mask
No Open-toed or Open-heeled Shoes
Training

Required Training

*Denotes courses offered online

Fire Safety & Extinguisher Training*
Laboratory Safety: Core Concepts*
Machine & Site-Specific Training

Recommended Training for Frequent Users

Electrical Safety & Lockout/Tagout
Laboratory Safety: Spill Procedures

Operation

Operation: Set-up

1. The Operating Instructions manual (located in the pilot plant office, 1955 Food Sciences Building) provides a complete description of the grinding mill, including directions for set-up, operation, troubleshooting, maintenance, and cleaning. Please be sure to completely read the Operating Instructions manual before operating the mill.

2. Be sure to acquire all required training, including site-specific and machine training directly from the pilot plant manager, before operating the mill.

3. Be sure to wear all required personal protective equipment as listed in this Standard Operating Procedure.

4. Position the mill on a level surface that is free from vibration.

5. The mill has a rotary adjustment knob to set the desired fineness of grind (see Figure 1). Turn the knob clockwise or counter-clockwise to set the mill for coarse or fine grinding, respectively. Exact positioning of the knob may have to be determined by trial and error with examination of the ground product’s particle size.

6. To be sure the mill contains no remnants of sample from the last time it was used. It may be necessary to use some of the new sample to “purge” the mill. Note: For further information, see Step 4 under the “Operation: Milling” section that follows.

Figure 1: Mahlkonig Burr Mill: Lock Plate and Grind-Fineness Adjustment Knob.
7. Position a receiving/transport container under the discharge chute. **Note: If the sample to be ground is small, the receiving vessel can be a plastic bag attached to the end of the discharge chute and secured with a twist-tie.**

8. Finally, the mill’s hopper is fitted with magnets to prevent ferrous metal fragments from getting into the grinder, contaminating the sample and possibly damaging the mill. The magnets should be checked for metal fragments prior to using the mill and cleaned before and after each use (see Figure 2).

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**Operation: Milling**

1. Prior to use, be sure to properly ground the mill using the ground-ing cable (refer to Figure 3 below). To achieve this, attach the grounding cable to the fastening pin on the side of the transport container or to some other piece of grounded metal (e.g., a water pipe, heating duct, etc.).

2. Safely plug the power cord into a properly grounded electrical outlet. **Note: Make sure the area around the outlet, floor and your hands are completely dry when plugging or unplugging the electrical cord to/from the outlet.**

3. Move the main slide or “lock plate” completely to the left to prevent feed material from entering the grinding chamber (refer to Figure 1).

4. If a small amount of feed material remains in the mill from the previous run, you may have to purge the mill to prevent this from contaminating your sample. If purging is necessary, add a small amount of the new sample to the hopper and process it thru the mill as described in the steps below. Rather than collecting the ground material, allow it to fall into a waste container and discard. The new feed material will sweep out/cleanse the grinder of any of the remaining previous sample. After this purging step, the new feed material can be milled and collected once a new receiving/transport container is positioned beneath the discharge chute.

5. Once purging (if necessary) is complete, add the sample to be ground into the hopper (see Figure 3).

6. Turn ON the mill by pressing the GREEN button of the On/Off Switch (see Figure 4).

7. After starting, move the lock plate completely to the right to allow feed material to enter the grinding chamber (refer to Figure 1).
8. Once the entire sample has been ground, turn OFF the mill by pressing the RED button of the On/Off Switch (see Figure 4).

9. Retrieve your ground sample by removing the receiving/transport container from under the discharge chute.

10. Safely unplug the power cord from the electrical outlet and initiate clean-up procedures. **Note:** Make sure the area around the outlet, floor and your hands are completely dry when plugging or unplugging the electrical cord to/from the outlet.

11. Report any operational difficulties to the pilot plant manager.

12. Initiate clean-up procedures.

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**Clean-up Procedures**

**Please note that these clean-up procedures are for non-transgenic grains only. Transgenic material has a separate, more thorough clean-up procedure, as all transgenic material must be accounted for. For more information, see special standard operating procedures for the handling of transgenic material.**

1. Before cleaning and/or servicing the mill, be absolutely certain that the mill is carefully turned OFF, unplugged, and locked out! **Note:** Make sure the area around the outlet, floor and your hands are completely dry when plugging or unplugging the electrical cord to/from the outlet.

2. Place the electrical plug in an elevated location away from the mill and work area that is to be cleaned.

3. Carefully remove the magnets from the hopper and remove any adhering iron fragments from the magnets (refer to Figure 2).

4. Position a waste container below the mill’s discharge chute.

5. Initiate check-out procedures by having the cleaned mill and surrounding work area inspected by the pilot plant manager.
Machine Care and Maintenance

For detailed maintenance instructions, refer to the Charlotte Colloid Mill Instruction Manual located in the pilot plant office, 1955 Food Sciences Building.

• The mill must be properly cleaned and inspected after each use. Inspect the machine for any leakage or broken parts, and report these to the pilot plant manager. **Note: All final inspections are performed by the pilot plant manager.**

• Oil level on the gauge at the side of mill should only be read while the mill is stationary and on a flat surface. The oil level should not be less than 1/3 or more than 1/2 full. The oil should be drained and replaced occasionally, especially after the first run. **Note: Be sure to use an equipment grade of non-detergent SAE 20 or SAE 30 oil.**

• Sanitary type 316 stainless-steel lip seals (Part #262) are very long lasting and are found on most Charlotte Colloid Mills. In most cases, a rotary mechanical-shaft seal is not required. The lip seal is a press fit and can be easily installed or removed. The following interchangeable seals can be provided for this mill:
  – Sanitary type 316 stainless-steel lip seals (Part #262).
  – Rotary mechanical-shaft seal with replacement wearing rings (Part #252). **Note: Both rotary mechanical shaft seal (Part #252) and lip seal (Part #262) can be used together.**

• For removing the rotor and installing the rotary mechanical shaft-seal assembly, please refer to the Instruction Manual located in the pilot plant office, 1955 Food Sciences Building.

Accessories

None