

Cylindrical Grinding

AIM

To perform cylindrical grinding on a given workpiece to achieve the required dimensions and surface finish.

TOOLS REQUIRED

1. Cylindrical grinding machine
2. Grinding wheel
3. Workpiece
4. Measuring instruments (micrometer, dial gauge, vernier calipers)
5. Coolant
6. Dresser (for the grinding wheel)

SEQUENCE OF OPERATIONS

1. Setup and preparation
2. Mounting the workpiece
3. Aligning the workpiece
4. Setting the grinding parameters
5. Dressing the grinding wheel
6. Grinding the workpiece
7. Measuring and inspecting the workpiece

PROCEDURE

1. Setup and Preparation

- Ensure that the cylindrical grinding machine is properly set up and calibrated.
- Select and install the appropriate grinding wheel for the material and the type of grinding operation.
- Check the coolant level and ensure that the coolant system is functioning properly.

2. Mounting the Workpiece

- Secure the workpiece between the headstock and tailstock centers or mount it in a chuck.
- Ensure that the workpiece is securely fastened and aligned with the machine axis.

3. Aligning the Workpiece

- Use measuring instruments to check the alignment of the workpiece.
- Adjust the tailstock or the workpiece mounting to ensure proper alignment.

4. Setting the Grinding Parameters

- Set the rotational speed of the workpiece and the grinding wheel.
- Adjust the feed rate and depth of cut according to the material and desired finish.

5. Dressing the Grinding Wheel

- Use the dresser to dress the grinding wheel, ensuring it is sharp and free of debris.
- Dress the wheel to the required profile if necessary.

6. Grinding the Workpiece

- Start the machine and allow it to reach the desired speed.
- Engage the grinding wheel with the workpiece.
- Gradually advance the grinding wheel to make contact with the workpiece.
- Perform the grinding operation, taking light cuts and using multiple passes to achieve the desired dimension and surface finish.
- Use coolant to prevent overheating and to wash away debris.

7. Measuring and Inspecting the Workpiece

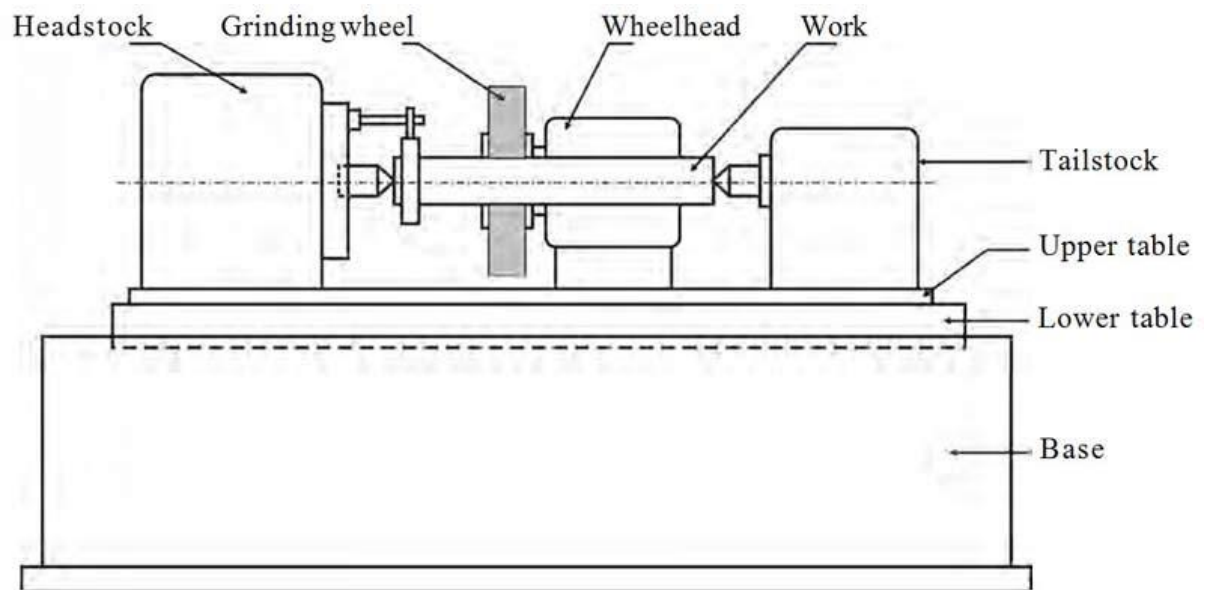
- Stop the machine and carefully remove the workpiece.
- Measure the workpiece using appropriate measuring instruments to ensure it meets the required specifications.
- Inspect the surface finish for any defects.

RESULT

- The workpiece should have the desired dimensions and surface finish as specified.
- The final product should be free of any defects such as burns, cracks, or chatter marks.

PRECAUTIONS

1. Always wear appropriate personal protective equipment (PPE) such as safety glasses, gloves, and ear protection.
2. Ensure the machine is properly set up and calibrated before starting the operation.
3. Use the appropriate grinding wheel for the material being machined.
4. Regularly check and maintain the coolant level to prevent overheating.
5. Dress the grinding wheel regularly to ensure it remains sharp and effective.
6. Do not exceed the recommended feed rate and depth of cut to prevent damage to the workpiece and the grinding wheel.
7. Keep the work area clean and free of any obstructions.
8. Follow all safety guidelines and operating procedures for the cylindrical grinding machine.



Cylindrical Grinding Machine