

Experiment - 6

Objective: To prepare mould and casting in boundary shop.

Material and tools required: Sieves, trowel, shovel, water, clay, molding box, riddle rammers gate cutter, crucible, lead, riser, parting sand, lifter, runner, etc.

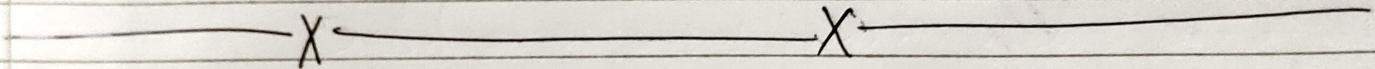
Procedure: • First of all a suitable flask is selected large enough to accommodate the pattern and also allow some space around it.

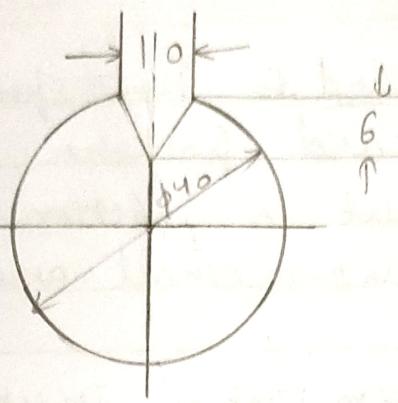
- The drag part is placed on the moulding board.
- The pattern is placed on the board inside the flask in such a position that space is left for gate cutting.
- It is in two parts the lower part of pattern is placed in drag.
- The drag is then filled with ordinary moulding sand & rammed.
- The excess sand cut off to bring it in level with the edges of flask.
- A small amount of dry loose sand is sprinkled over the top surface and the drag turned upside down along with a bottom both placed over it.
- The cope is then placed over the drag & the top part the pattern assembled.
- Dry, loose parting sand is then sprinkled over the entire surface of drag & pattern.
- Runner & riser are put in position and supported vertically by tucking a small amount of moulding sand around them.
- The axis sand is then cut off the runner & riser is removed vertically perform pouring basin format & dry sand sprinkled on top surface.
- A bottom board is placed over the cope & the latter rolled over.
- The pattern parts are then removed from the drag & cope.

- Repairs, if any are made and gates are cut, dressing is then applied.
- If it is dry sand mould it is baked the dry sand core if any are located in position in mould closed for pouring.
- The molten metal is poured to achieve the desire mould.

Result: Mould is prepared.

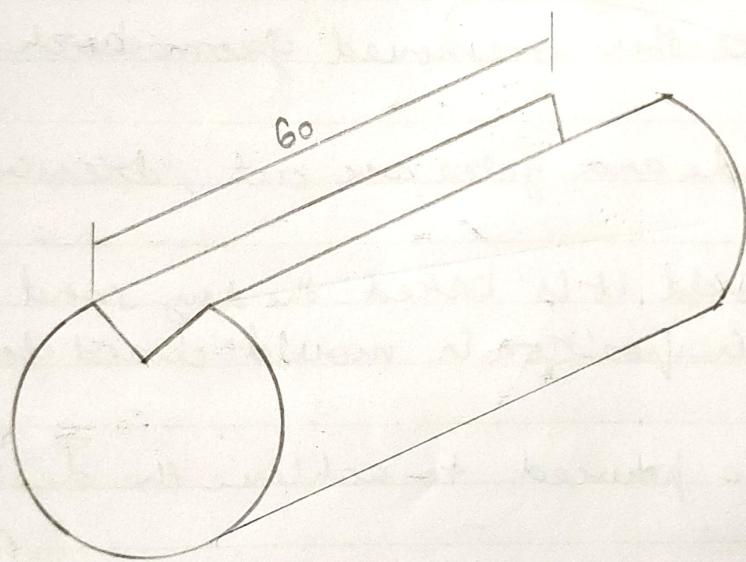
Precaution: a) Ramming of sand should be done properly.
b) Water content should be in proper proportion in moulding Sand





V-Groove

(All dimensions
are in mm)



Experiment - 07

Objective: V-Groove Preparation on the Shaper

Material Required: Mild steel round bar (60mm x 40mm)

Tools Required: ① Shaper Machine

② V shape cutting tool

③ Spanner set

④ Surface plate & scriber

⑤ Hammer and centre punch

Procedure: ① Clamp the work piece in the vice & tight it properly.

② Then adjust the stroke of the ram, adjustment of the stroke is made such that the tool cuts the job completely & after that 10-16 mm of clearance should be provided.

③ Then given the feed to tool & feed should be given nominal.

Result: The required V-Grooves has been prepared on the shaper.

Precautions: 1) The job should be clamped tightly in vice.

2) Stroke should be adjusted properly.

3) Don't stand in front of the ram while running.

4) Tool should be tightly fixed.

5) Depth of cut should be minimum.

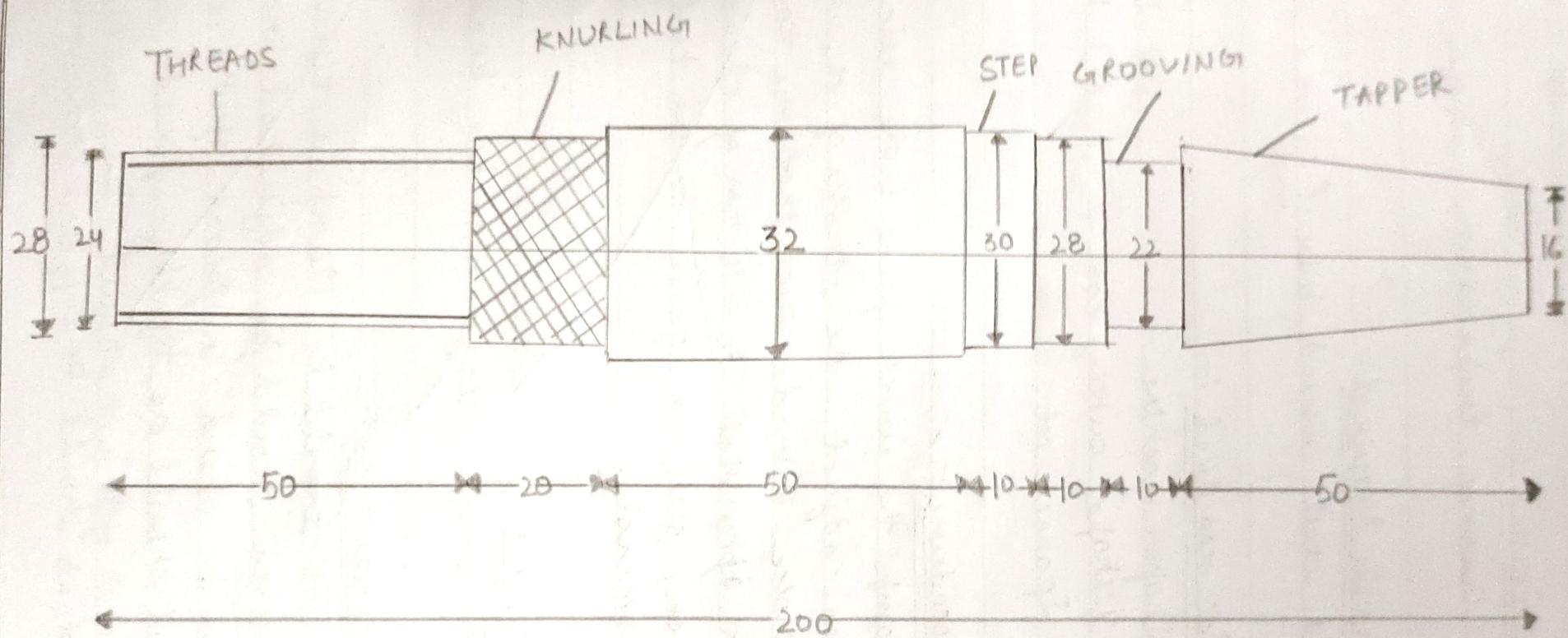
6) Coolant should be supplied continuously during cutting.

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Teacher's Signature

X



Experiment - 08.

Objective: To perform Job involving Turning, Knurling and Grooving practices on Lathe Machine.

Material Required: Mild Steel round bar (200mm)

Tools Required:

- 1) Centre Lathe machine
- 2) Right hand side cutting tool
- 3) V shape cutting tool
- 4) Knurling and Grooving tool
- 5) Tool post Spanner
- 6) Steel rule
- 7) Outside Calliper
- 8) Surface gauge and Vernier calliper, etc

Procedure :

- Hold the mild steel job properly in chuck on lathe machine.
- Check the position of job, it should be in the centre of job.
- Check all the levers, etc. They should be unengaged before starting machine.
- After switching on machine, see visually the approximate centre of job. It should not revolve in elliptical position.
- Switch off the machine & mount the tool bit in the tool post in proper position. It should be well tightened & tip should coincide with centre.
- Tilt position of tool post in such a manner that the tip of the tool bit come about $30-40^\circ$ with the job.
- Then feed the tool post towards the job with help of cross slide till the tip of the tool tip reach at centre of the job.
- After facing, till back the tool post to its previous position so that tip of tool bit come at right angle position with job. Now feed will

be given with the help of carriage. This metal removing process from the surface of job is known as plain turning & when a workpiece having different diameters is turned, the surface forming the steps from one diameter to other is called step turning.

- Fix carriage into the position. Now tilt the compound rest to desired angle. And feed the tool into the job with the help of cross slide and compound rest feed handle.

Angle of taper can be calculated as:-

$$\tan \alpha = D-d/2L], \text{ where } D = \text{Large diameter}, d = \text{small diameter}, L = \text{length}$$

- for grooving operation, fix the grooving tool on the toolpost. Feed tool into revolving job with the help of carriage & cross slide to get grooving.
- After grooving engage back gear & reduce the speed of spindle & replace the grooving tool bit with knurling tool bit & press it over surface.
- for threading, engage the feed rod lever and suitable gears in proper way, etc.. Now threading tool will be moved with help of half nut lever.

Result: The various machining operations had performed on Lathe Machine

Precautions: 1) Known the basics of operational mechanism very well.

- 2) Don't wear loose clothes.
- 3) Adopt always right tool and right mechanism.
- 4) Always check that all gears & levers should be engaged or in ideal position.
- 5) make sure that the job & tool bit are mounted well in proper position.
- 6) Use proper feed to the tool bit along with appropriate speed.
- 7) Never use outside calliper / steel rule / Vernier calliper, etc.
- 8) Threading and knurling should be done on minimum speed along, etc.
- 9) If you are feeling any abnormality in sound, etc. off machine, switch off the machine and inform the shop-in-charge immediately.

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Teacher's Signature

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