General advice on work safety

To prevent injury to the lathe operator and other persons the relevant safety regulations laid down by the Professional Trade Association (UVV) must be observed at all times. The aim of these regulations is to draw attention to hazards and risks and to prevent accidents.

Main aspects of the UVV Regulations and other safety criteria for lathe operators:

▶ Operators must receive appropriate instruction on machine tools before commencing work for the first time

▶ No jewelry is to be worn

▶ Wear close-fitting clothing and do not wear gloves; wear safety glasses and a hair-net (if necessary)

▶ Choose suitable clamping tools and ensure that tools and workpieces are held securely; ensure that chuck keys are removed and kept in a safe place

▶ Test the machine before commencing work

▶ Check for concentricity at low speed and correct any out-of-true

▶ Use a carriage stop to restrict lathe travel; set machine feed and speed correctly

▶ Ensure that chips are properly removed from the working area

▶ Never attempt to measure or check moving workpieces

▶ Do not decelerate the jaw chuck by hand

▶ Cleaning and chip removal must only be carried out when the machine is at rest

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	General information	

Exercise 2

$\sqrt{\text{R}_z\,63}$ ($\sqrt{\text{\o}}$)

DIN 332- A 2.5 x 5.3

∅ 16

XXX

146 ± 0.3
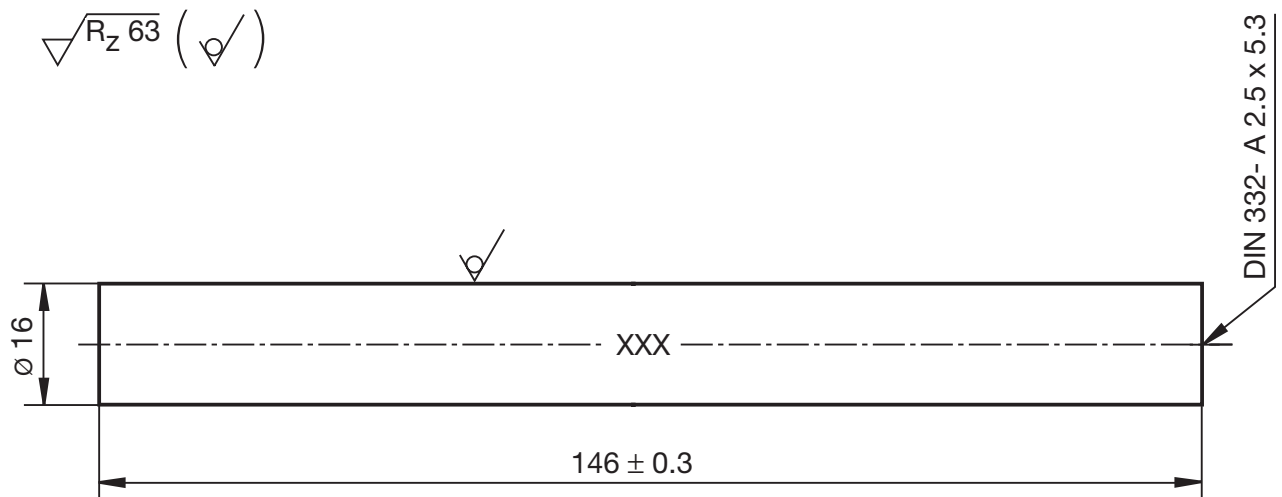
General tolerances to ISO 2768 m

XXX = Identification Number

Working sequence

1. Secure workpiece in chuck
2. Fit and align cutting tool
3. Face one side of the workpiece
4. Deburr workpiece
5. Re-chuck workpiece
6. Face the workpiece to 146 mm size and centre
7. Deburr workpiece
8. Unclamp workpiece

Useful tips

▶ Cutting-tool insertion depth should be as short as possible to prevent chatter marks

▶ When facing the workpiece the cross slide should be advanced by hand

▶ Maximum depth of cut per cycle is 1 mm

ad 1.

15
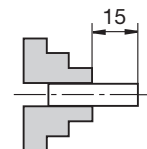
For tools and materials, work-safety and environmental guidelines see follow-up sheet

Item	Qty.	Unit	Designation	Specification	Material	Semi	Comment
1	1	pc.	Round steel	----	----	----	From exercise 1
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			Round steel				Scale 1:1

Exercise 8

Tools

▶ Draw-in collet

Work safety

▶ Remove the chuck key after use

▶ Wear close-fitting clothing

▶ Wear safety goggles

▶ Always deburr gripping the file with your left hand

▶ Remove chips using chip removal tool or brush

Environmental protection

▶ Apply cooling lubricant in metered doses

▶ Dispose of chips and swarf in an appropriate container

▶ Dispose of oily rags separately

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Mathematics test

1. A bolt of Ø 50 mm is to be machined down to Ø 48 mm. Calculate the rotational speed that has to be set if the cutting speed v_c = 25 m/min.

2. A bearing pin is to be machined at a rotational speed of 400 min^{-1}. Calculate the cutting speed for a workpiece diameter of 120 mm.

3. How wide can the diameter of a workpiece be if the rotational speed is 280 min^{-1} and the cutting speed 40 m/min? Give the diameter in mm.

4. You have been given a workshop order to manufacture a cone. The diameters are D = 20 mm and d = 10 mm. The cone has a length of 30 mm. Calculate the cutting angle $\frac{\alpha}{2}$.

5. In the case of a cone with D = 60 mm, cone length L = 40 mm and tan $\frac{\alpha}{2}$ = 0.5, how big is d?

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	Mathematics test		

1. Which of the following is a metal machining process according to DIN 8580?

1. Filing
2. Bending
3. Straightening
4. Turning
5. Curving

2. Which of the following machines is also referred to as a universal lathe?

1. Facing lathe
2. Leadscrew/feedshaft machine lathe
3. Turret lathe
4. Duplicating lathe
5. Vertical turning mill

3. Which of the following cannot be carried out on a universal lathe?

1. Facing
2. Plain turning
3. Parting off
4. NC form turning
5. Non-circular turning

4. The size of a universal lathe is determined by ..?

1. The "swing" and width between centres
2. The size of the machine tool table
3. The length of the lathe bed
4. The size and length of the head stock
5. The power output of the drive motor

5. What determines the "swing" of the lathe

1. The distance between the centres
2. The distance between the top of the bed and the "live" centre
3. The distance between the cross slide and the top slide
4. The distance between the tool table and the tailstock
5. The distance between the tailstock sleeve and the centre punch

6. Which of the following formulae is used to calculate cutting speed?

1. $v_c = \dfrac{d \cdot \pi \cdot 1000}{n}$

2. $v_c = d \cdot \pi \cdot n$

3. $v_c = \dfrac{1000 \cdot \pi}{d \cdot n}$

4. $v_c = \dfrac{d \cdot n}{\pi}$

5. $v_c = \dfrac{d \cdot 1000}{\pi \cdot n}$

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