Exercise 2

Learning objectives:

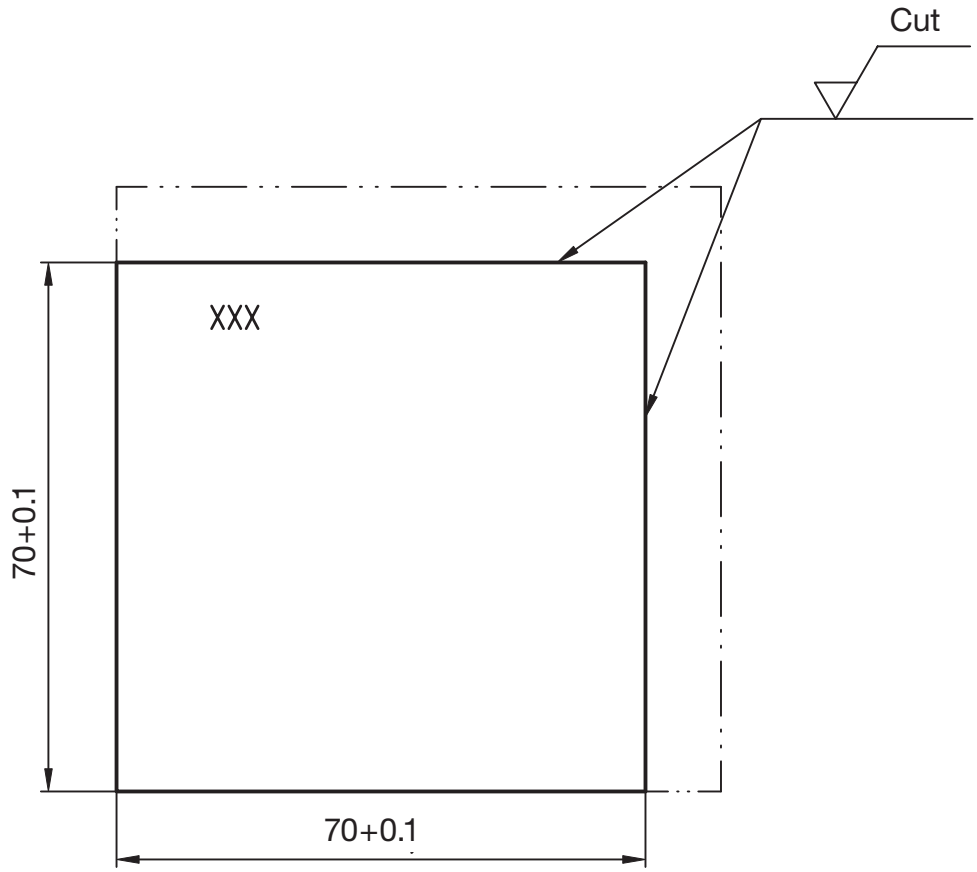
a) Skills-based:

- Mark reference planes with letter punches
- How to use a scriber, steel ruler, ruler, try square, punch and dividers
- Transfer dimensions to the workpiece by drawing scribing lines
- Punch points of intersection for the scribing lines

b) Knowledge-based:

- Describe the "scribing" processing method
- Define the term reference plane
- Explain the "measuring" processing method
- Describe the components of the measuring and scribing tools and how to use them
- Explain the work techniques for scribing workpieces with one and two reference planes
- Explain the "punching" processing method
- Describe the components of the punch and the differences between a scribing punch and centre punch
- Describe the punching procedure
- Describe the options for correcting punching errors
- Describe the components of the dividers and how to use them
- List measures to avoid injuries when scribing and punching

Exercise 4



XXX = ID number

	1	Piece	Flat steel	DIN EN 10278	S235JRC+C	80 x 15 x 80	
Item	**Quantity**	**Unit**	**Description**	**Standard sheet**	**Material**	**Semi-finished product**	**Remarks**
							Metal working
			Manual material processing				**Exercise 4**
			Fitting (sawing)				Scale 1:1

Exercise 6

Sawing workflow

1. Measure workpiece to check it
2. Scribe a dimension of 70 mm
3. Saw along the scribing line

Filing workflow

1. File the web surface evenly (smoothing)
2. File the narrow surfaces of the flange evenly and parallel to the web surface to a dimension of 33 mm
3. File one flange surface evenly and at an angle to the web surface
4. File the second flange surface evenly, at an angle to the web surface and parallel to the opposite flange surface to a dimension of 62 mm
5. File one face evenly and at an angle to the web surface and one flange surface
6. File the second face evenly, at an angle to the web surface and flange surface and parallel to the opposite face to a dimension of 68 mm
7. Deburr the workpiece on all sides and measure it to check it

Equipment

- Vernier gauge
- Flat square
- Files
- File brush
- Insert block
- Hand hacksaw
- Scriber

Notes

- Use jaw protectors
- Clamp the workpiece with an insert to smooth the flange surfaces
- Clean the file at short intervals with the file brush
- Remove traces of chips left behind with a file cleaner (brass or copper sheet)

Occupational safety

- The file handle must be checked for a tight fit
- Do not bang the file handle against the workpiece
- Remove filings with the hand brush

Environmental protection

- After sawing, dispose of the waste piece in the designated container. The same also applies to used saw blades.

1. List the fundamental ground rules for filing irregular cross sections.

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2. List the insert used to clamp round steels.

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3. What test equipment and which method are used to check the angularity of faces?

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4. Short material designation:
Rd 25 x 80-11SMn30+C EN 10278

What does the letter +C mean?

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5. Name at least two measures to avoid injuries when filing the face of round steel.

Exercise 11 c

Learning objectives:

a) Skills-based:

- Determine the centre point of a circular area using the centring l-bar
- Drill blind holes
- Cut internal threads in blind holes

b) Knowledge-based:

- Explain the skill of centring
- Explain the work technique for marking with the centring l-bar
- Explain the term blind hole
- Explain the work technique for cutting internal threads in blind holes
- Explain the short material designation
- Calculate the bore depth of blind holes
- List measures to avoid injuries when drilling and cutting internal threads