Operations on Smooth Miller and Thicknessing Miller – Course: Mechanical woodworking techniques. Instruction examples for practical vocational training

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Preliminary Remarks

This material contains six selected instruction examples which are useful for applying and improving knowledge in the field of the working techniques of milling broad and narrow faces as well as of milling to thickness and width.

In order to facilitate preparations and operations, the necessary materials, machines, measuring and testing means as well as auxiliaries are specified for each instruction example.

Furthermore, the previous knowledge is mentioned that is additionally necessary for milling broad and narrow faces as well as for milling to thickness and width. It is recommended to repeat this knowledge before starting the work.

The sequence of operations specified for each instruction example includes working steps leading to the manufacture of the relevant workpiece. This order is to be absolutely observed for reaching a good quality.

A working drawing is attached to each instruction example showing the required shapes and dimensions of the workpiece. It is also possible to choose other practising pieces with smaller or bigger dimensions.

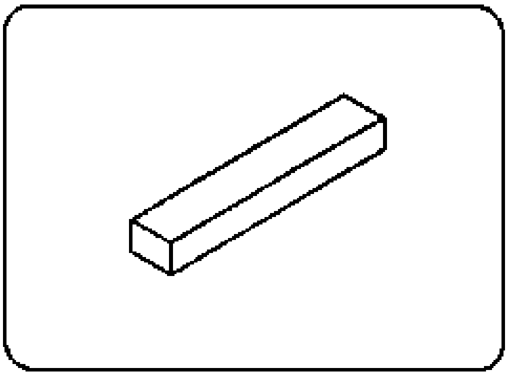
Instruction Example 2.1.: Frame Piece

The broad face of a ledge is milled to a plane surface.

Material
Sawn timber

Dimensions:

Length	1000 mm
Width	60 mm
Thickness	45 mm



Machine

Smooth miller

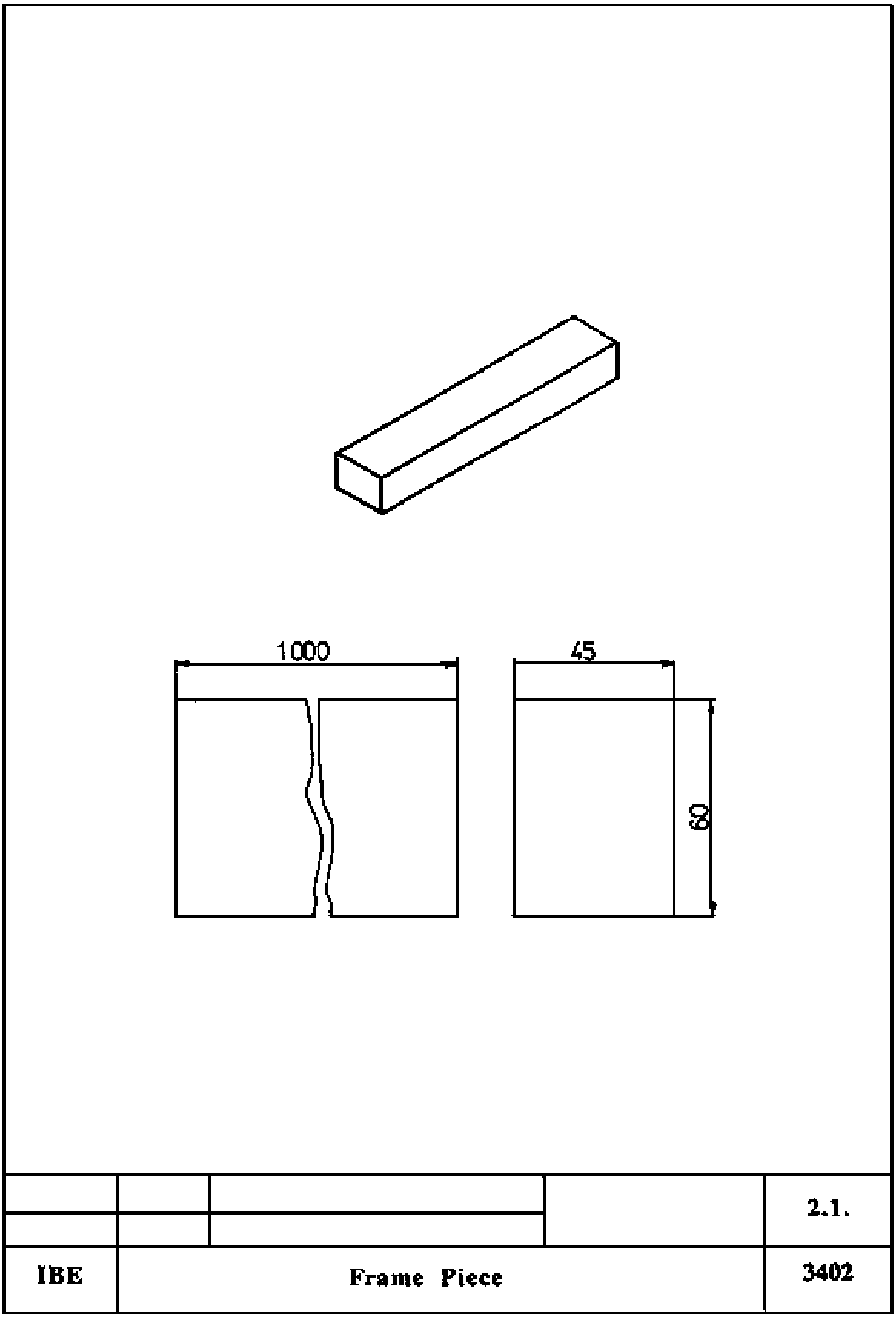
Measuring and testing means

Folding rule

Required previous knowledge

Reading of drawings, measuring and testing, “Manual Woodworking Techniques − Planing a Narrow Face by Hand”.

Sequence of operations	Comments
1. Set working width, set depth of cut and place frame pieces at disposal.	Check safety devices.
2. Switch on the machine.	Take notice of star−delta connection or direct connection. Make use of ear protectors.
3. Mill the frame piece on its broad face by hand.	Take notice of existing roughness of the broad face when guiding the workpiece. Shift the pressure step by step to the unloading table.
4. Check the milled broad face.	Check two machined workpieces by laying one on the top of the other. The broad faces must sit closely on top of one another.
5. Switch off the machine.	Possible addition: Mill wooden parts of different dimensions on their broad faces.



Frame Piece

Instruction Example 2.2.: Frame Piece

The narrow face of a ledge (see Instruction Example 2.1) is milled at an angle of 90° to the broad face.

Material

Machined ledge from Instruction Example 2.1.

Machine

Smooth miller

Measuring and testing means

Solid steel squares, folding rule

Necessary previous knowledge

Reading of drawings, measuring and testing, “Manual Woodworking Techniques – Planing a Narrow Face by Hand”.

Sequence of operations	Comments
1. Set working width, set depth of cut, place material at disposal.	Check the safety devices, check the angle of the stop rule.
2. Switch on the machine.	Take notice of star–delta connection or direct connection, wear ear protectors.
3. Mill the frame piece on its narrow face guiding at the stop rule by hand.	The frame piece must closely sit with its broad face at the stop rule.
4. Check the milled narrow face.	The narrow face must be in the required angle to the broad face, lay one narrow face on top of the other, both must sit closely.
5. Switch off the machine.	Possible addition: Mill wooden parts of different dimensions on their narrow faces.

Instruction Example 2.3.: Frame Piece

The surface of the ledge from the preceding Instruction Examples are milled to thickness.

Material

Machined ledge from Instruction Example 2.2.

Machine

Thicknessing miller

Measuring and testing means

Folding rule, vernier caliper

Necessary previous knowledge

Milling of surfaces on the smooth miller, reading of the drawing, measuring and testing, “Manual Woodworking Techniques – Planing the Broad and Narrow Faces by Hand”.

Sequence of operations	Comments
1. Place the material at disposal, set the sizes on the scale of the machine.	Check rebound protection for functionality.
2. Switch on the machine.	Take notice of star–delta connection or direct connection, wear ear protectors.

3. Insert the frame piece up to the draw−in roller by hand.	Put the workpiece with that face on the table, which has been machined on the smooth miller.
4. Check the machined workpieces for dimensional accuracy.	Undertake dimensional inspection, using the folding rule or vernier caliper.
5. Switch off the machine.	Possible addition: Mill workpieces of different dimensions to thickness.

Instruction Example 2.4.: Grating

For producing ledges for a grating, milling of broad and narrow faces on the smooth and thicknessing miller is to be practises.

Material

4 x sawn timer

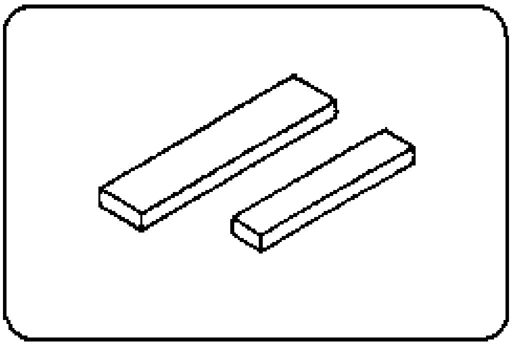
Dimensions:

Length	1000 mm
Width	80 mm
Thickness	25 mm

2 x sawn timber

Dimensions:

Length	450 mm
Width	60 mm
Thickness	25 mm



Machines

Smooth miller, thicknessing miller

Measuring and testing means

Solid steel squares, folding rule, vernier caliper

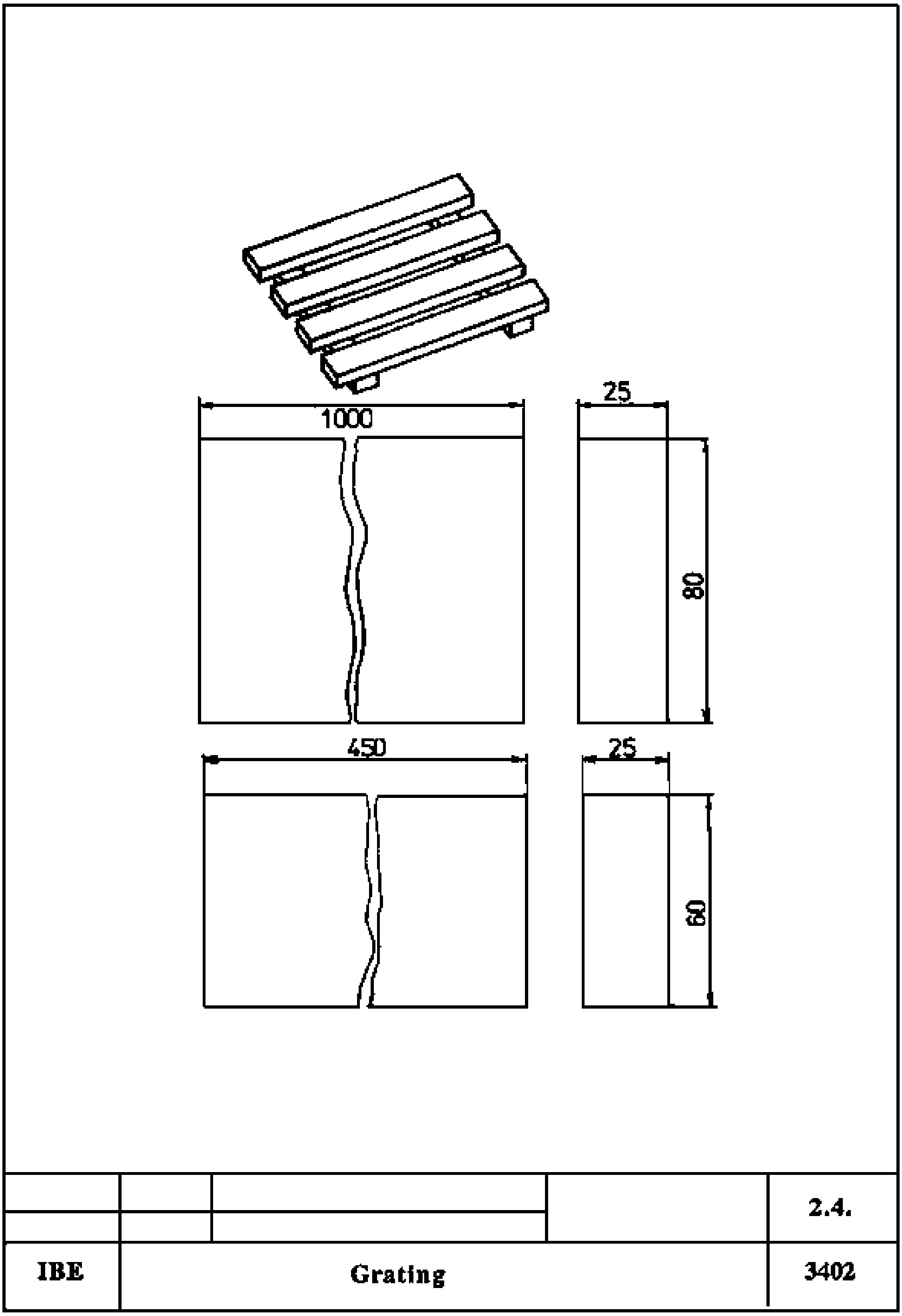
Auxiliary

Feeding device

Necessary previous knowledge

Reading of drawings, measuring and testing “Manual Woodworking Techniques – Planing the Broad and Narrow Faces by Hand”.

Sequence of operations	Comments
1. Place material at disposal, set working width and depth of cut on the smooth miller.	Check the safety devices.
2. Switch on the machine, mill a broad and a narrow surface.	Take notice of surface roughness when guiding the workpiece. When milling the short ledge, make use of the feeding device.
3. Check the milled surfaces.	Check flatness of the broad face and angularity of the narrow face.
4. Set the thicknessing miller to the required size.	Take into account maximum chip removal.
5. Switch on the machine and mill the ledges to the required thickness and width.	Do not put in workpieces of quite different thickness side by side.
6. Control dimensional accuracy.	Dimensional inspection with folding rule or vernier caliper.
7. Completion: Saw the ledge to the given length. Smooth off comers with abrasive paper. Join the ledges by bolted or nail connection.	



Grating

Instruction Example 2.5.: Wall Shelf

Practise milling of broad and narrow faces on the smooth miller.

Practise milling to thickness and width on the thicknessing miller for producing piece parts for a wall shelf.

Material

– Sawn timer

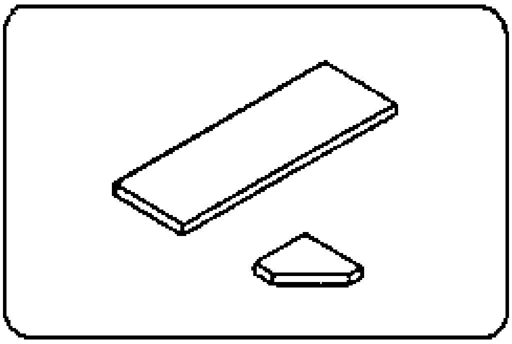
Dimensions:

Length	800 mm
Width	200 mm
Thickness	25 mm

– 2 x sawn timber

Dimensions:

Length	400 mm
Width	190 mm
Thickness	25 mm



Machines

Smooth miller, thicknessing miller

Measuring and testing means

Solid steel squares, folding rule, vernier caliper

Auxiliary

Feeding device

Necessary previous knowledge

Reading drawings, measuring and testing "Manual Woodworking Techniques – Planing the Broad and Narrow Faces by Hand".

Sequence of operations	Comments
1. Place the material at disposal, set the working width and the depth of the cut on the smooth miller.	Check the safety devices, make use of the ear protector.
2. Mill a broad and a narrow face.	Take notice of surface roughness when guiding the workpiece. Make use of the feeding device.
3. Control the broad and the narrow face.	Check flatness of the broad face and angularity of the narrow face.

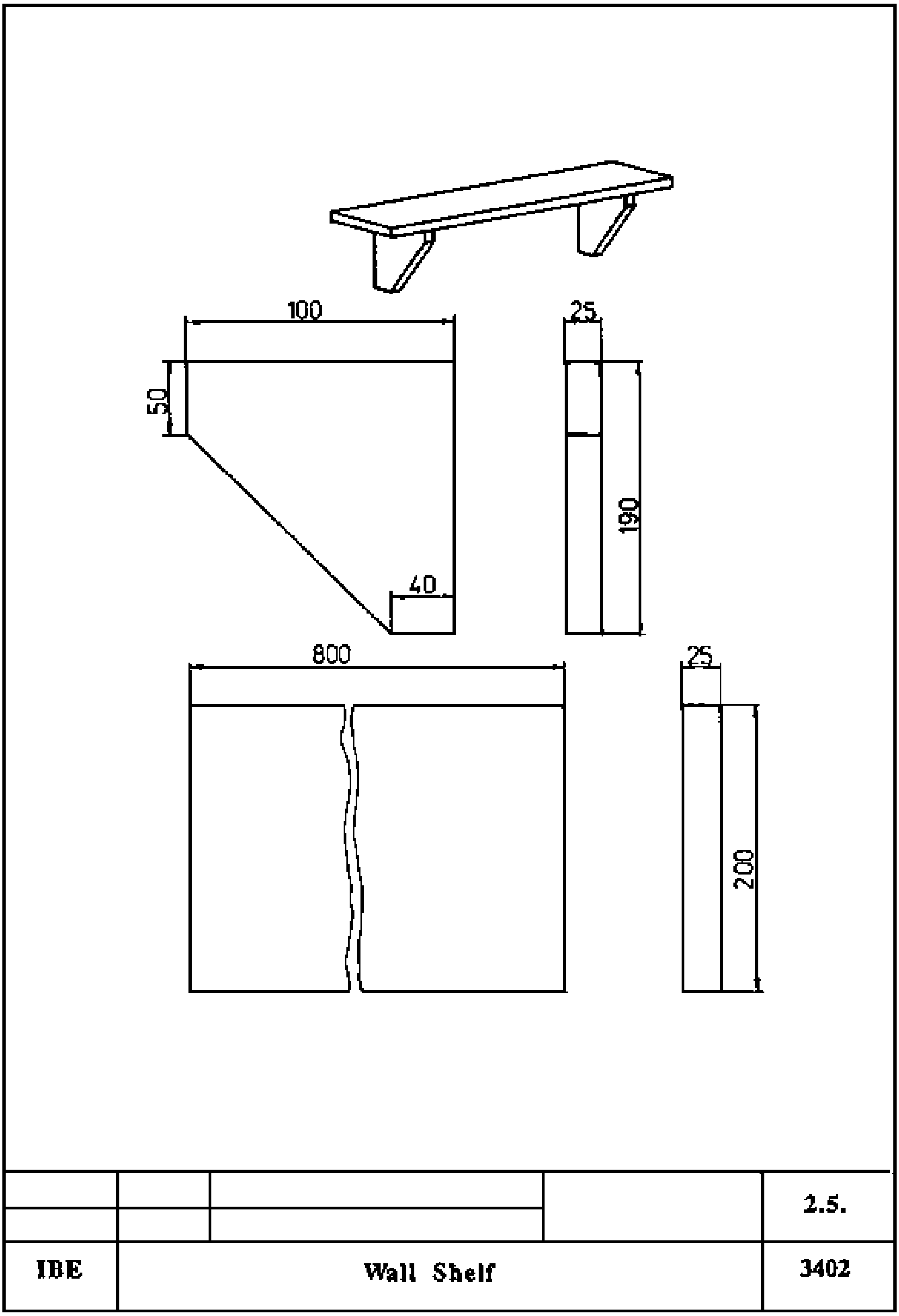
4. Set the thicknessing miller to the required dimension. Switch on the machine and mill the workpiece to thickness and width.

Take into account maximum chip removal. Do not put in workpieces which are of quite different thickness, side by side.

5. Control dimensional accuracy.

Dimensional inspection with folding rule or vernier caliper.

6. Completion:
Mark the piece parts according to the drawing and cut them to size. Smooth off edges and comers. Join supports and shelf by bolted connection and flat comer joint.



Wall Shelf

Instruction Example 2.6.: Frame

Practise milling of broad and narrow faces on the smooth miller.

Practise milling to thickness and width on the thicknessing miller for producing frame ledges.

Material

– 2 x sawn timber

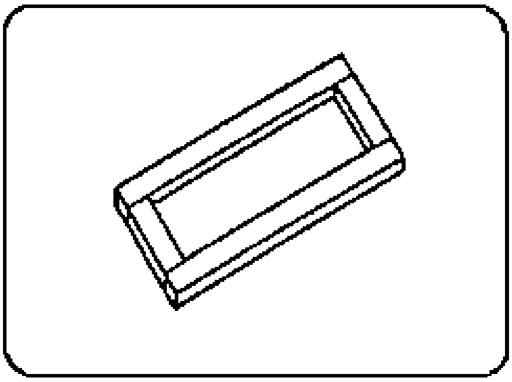
Dimensions:

Length	2000 mm
Width	120 mm
Thickness	35 mm

– 2 x sawn timber

Dimensions:

Length	900 mm
Width	120 mm
Thickness	35 mm



Machines

Smooth miller

Measuring and testing means

Solid steel squares, folding rule, vernier caliper.

Necessary previous knowledge

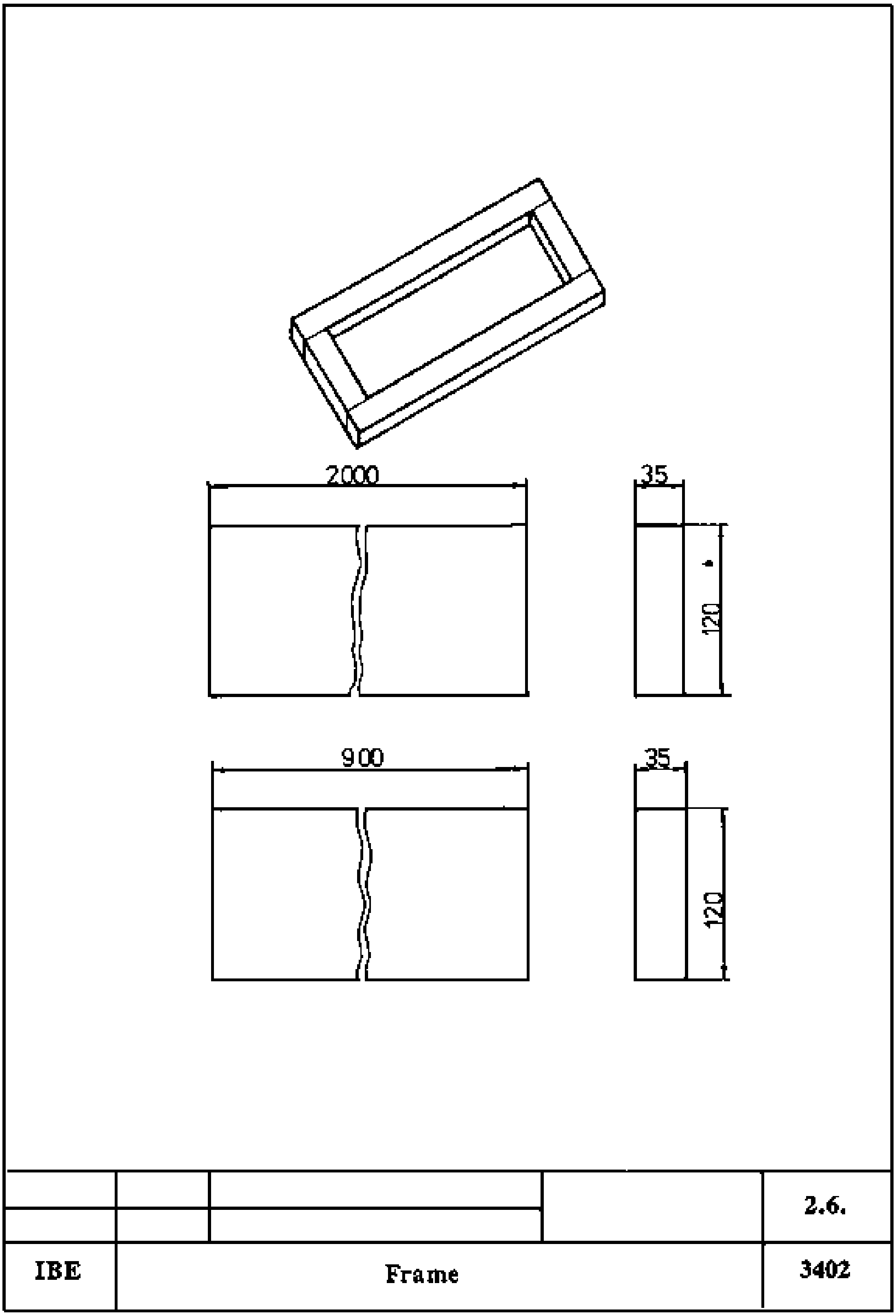
Reading drawings, marking, measuring and testing, making a slotted frame connection, pasting together connections.

Sequence of operations	Comments
1. Place the material at disposal, set the smooth miller.	Check the thickness of the strip scutter, visual checking or mill a test piece.
2. Mill a broad and a narrow face.	Long workpieces require special skill for milling, do not give too much pressure to avoid deflection.
3. Control the milled broad and narrow face.	Check flatness of the broad face and angularity of the narrow face.
4. Mill to width and thickness on the thicknessing miller.	Take notice of surface roughness when guiding the workpiece.

5. Control of dimensional accuracy.

Dimensional inspection with folding rule or vernier caliper.

6. Completion:
Piece parts are to be sawn to length according to the drawing. Mark the slotted frame connection and carry out. Paste together the connection. Smooth the surfaces of the frame. Smooth off edges.



Frame