

Working with Drilling Machines – Course: Mechanical woodworking techniques. Instruction examples for practical vocational training

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Working with Drilling Machines – Course: Mechanical woodworking techniques. Instruction examples for practical vocational training

**Institut für berufliche Entwicklung e.V.
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Author: Frank Wenghöfer

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Institut für berufliche Entwicklung e.V.
Parkstraße 23
13187 Berlin

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Preliminary Remarks

The present material includes 3 instruction examples where the drilling of bottom bores and through hole bores of smaller and larger diameters can be practised. Thereby a brush stand for workshop use and decorative boards for a wall shelf are being manufactured. The wall shelf should be mounted by dowel and screw joints.

In order to ease the preparation and the execution of the jobs for each instruction example the necessary materials, machines and tools, measuring and testing means and auxiliaries are mentioned to carry out the exercises. The added working steps include the sequences of operations to carry out the exercises.

To each instruction example a working sketch is added where the measures and forms of the work pieces can be taken from.

The bore distances shall be determined on the pieces themselves.

Pay attention to the fact that Instruction Example 03.2. is to be manufactured as component part for Instruction Example 03.3.

Be accurate with the external measures in this case.

Instruction Example 03.1.: Brush Stand

Manufacturing of simple bottom bores to produce a stand to store brushes.

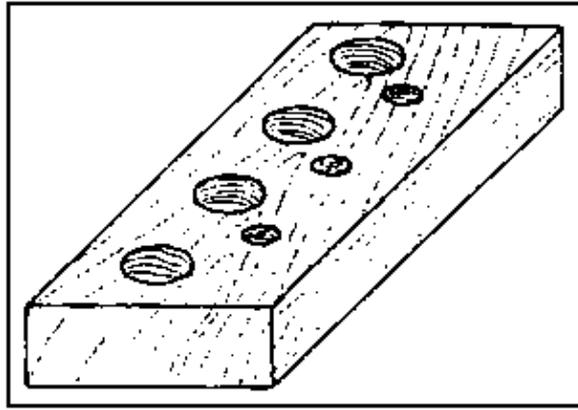
Material

Piece of squared timber with all faces being planed

length: 120 mm

width: 70 mm

thickness: 70 mm



Machines and tools

Bench drilling machine, twist drill with centering drill point \varnothing 10 mm and \varnothing 15 mm, pencil, marking gauge, countersink, awl

Measuring and testing means

Folding rule, steel square

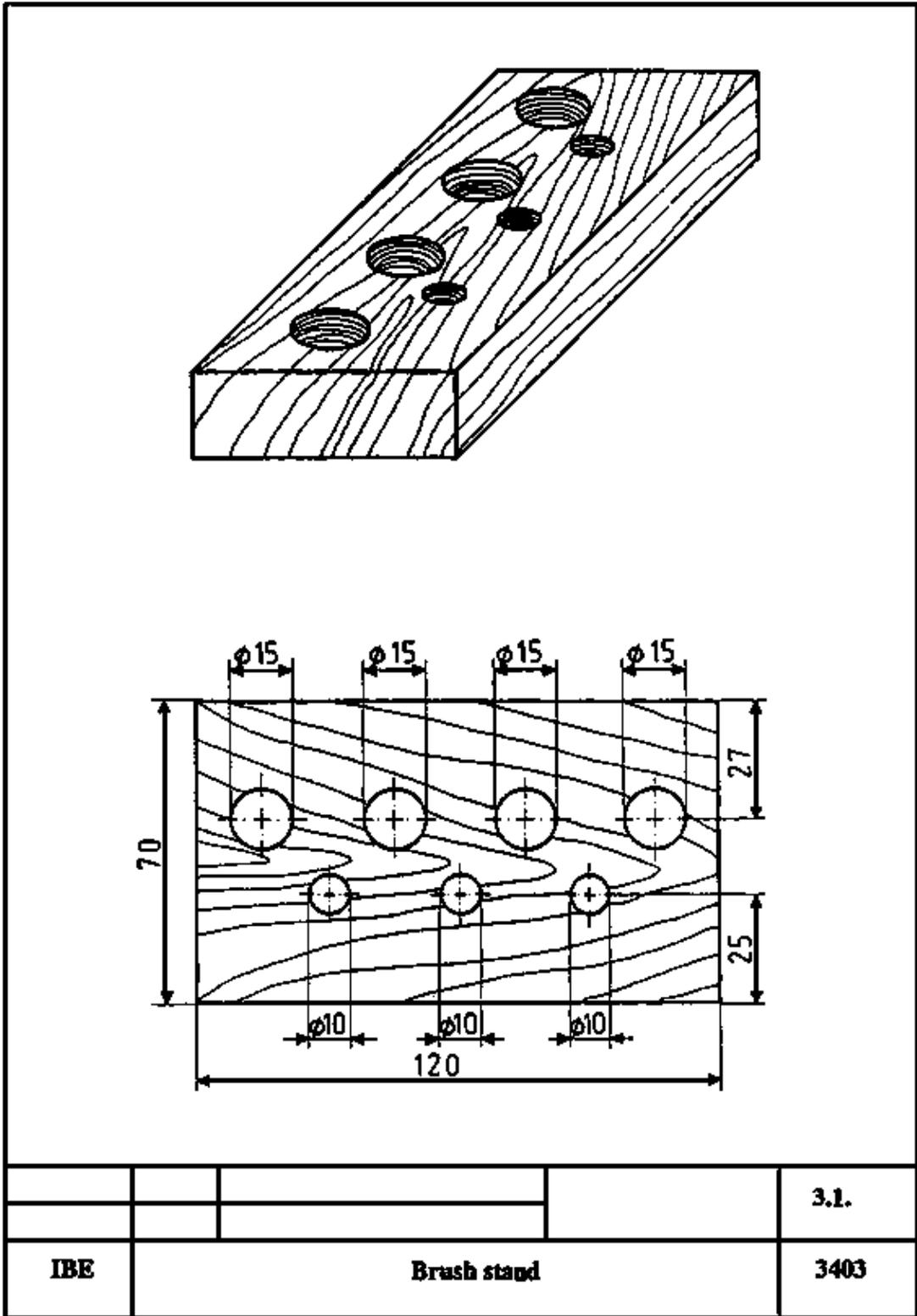
Auxiliaries

Clamping means

Necessary basic knowledge

Measuring and marking

Sequence of operations	Comments
1. Preparing the working material Checking the machine for functioning	Check for completeness
2. Marking the piece of squared timber, determining the bore centres	Pay attention to the bore distances to be regular!
3. Clamping the drill \varnothing 10 mm and fastening the piece of squared timber	Adjust the bore centre exactly beneath the drill point then fasten!
4. Manufacturing the bores to a depth of 50 mm.	Adjust the piece of work after every bore again and fasten!
5. Manufacturing the bores of \varnothing 15 mm in the same way	
6. Slightly countersinking the bores with the countersink	
7. Cleaning the workpiece+	
8. Checking all bores	<ul style="list-style-type: none"> – regularity of the bore distances – dimensional accuracy of the depth – clean bore edges



Brush stand

Instruction Example 03.2.: Decorative Board

Manufacturing of large through holes to produce a decorative board.

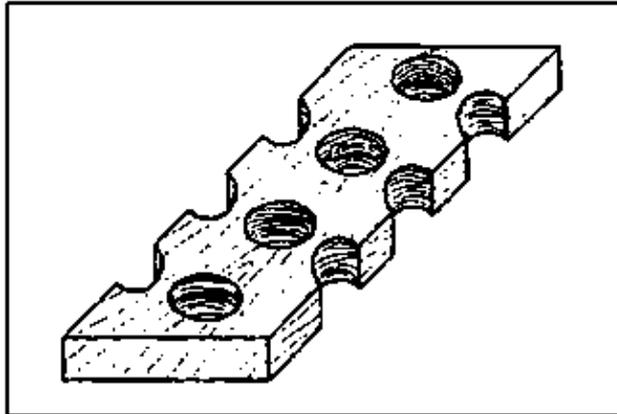
Material

A planed board

length: 500 mm

width: 70 mm

thickness: 20 mm



Machines and tools

Bench or pillar drilling machine, pencil, marking gauge, awl, round shank Forstner bit \varnothing 30 mm

Measuring and testing means

Folding rule, steel square

Auxiliaries

Clamping means

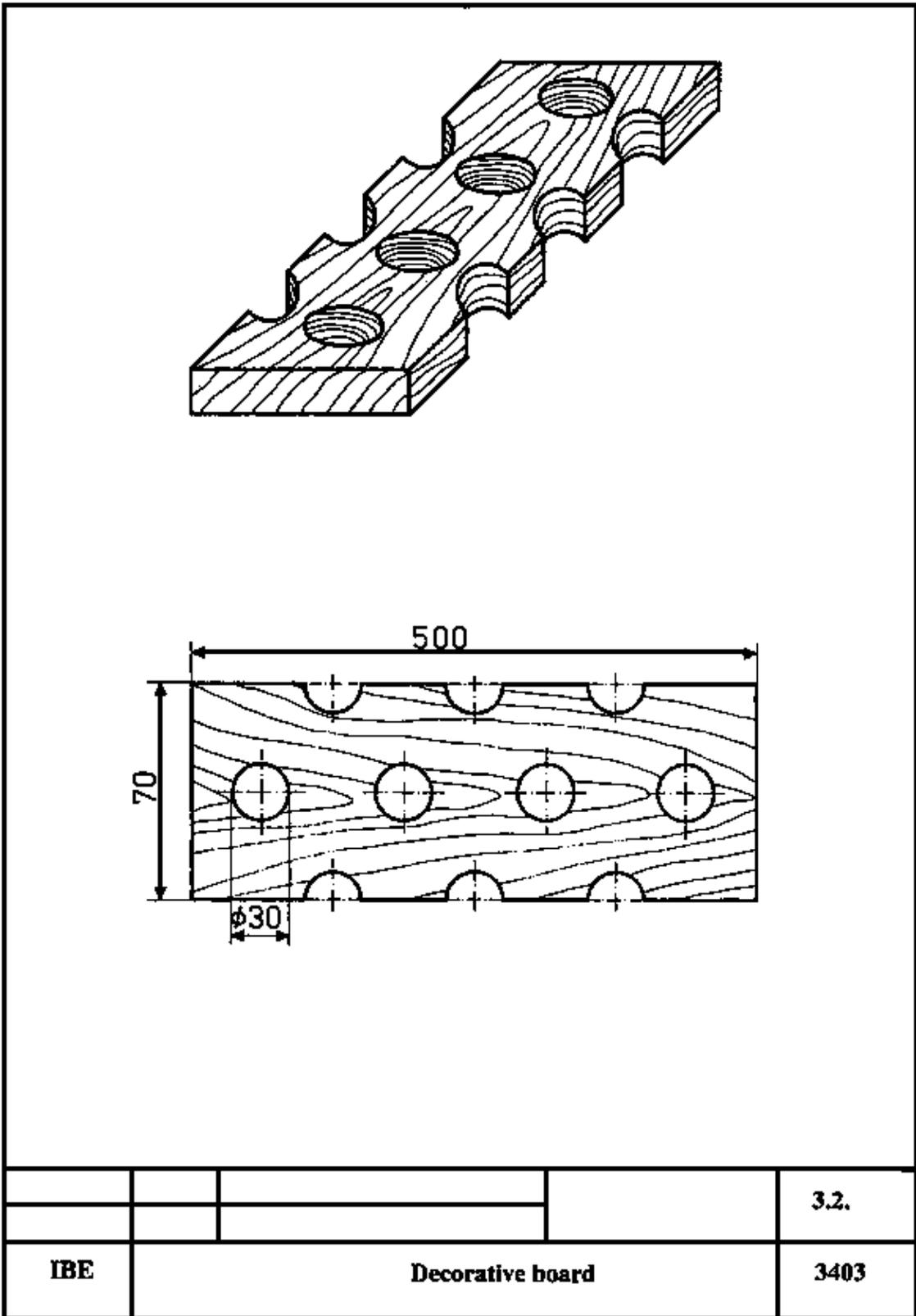
Necessary basic knowledge

Measuring and marking

Sequence of operations

Comments

- | | |
|--|--|
| 1. Preparing the working material
Checking the machine for functioning | Check for completeness |
| 2. Marking the board, determine the bore distances yourself,
marking out the bore centres | Pay attention to the bore distances to
be regular! |
| 3. Clamping the drill and placing the board | Adjusting the bore centres exactly! |
| 4. Carrying out the bores | |
| 5. Cleaning the board | |
| 6. Checking the bores | – regularity of the bore distances
– clean bore edges |
| 7. Manufacturing a second decorative board | |



Decorative board

Instruction Example 03.3.: Wall Shelf

Manufacturing of bores for dowel and screw joints to mount a wall shelf.

Material

- 2 prefabricated decorative boards (Instruction Example 03.2.)

length: 500 mm

width: 70 mm

thickness: 20 mm

– 1 planed board

length: 500 mm

width: 80 mm

thickness: 20 mm

– 2 planed and half-round cut boards

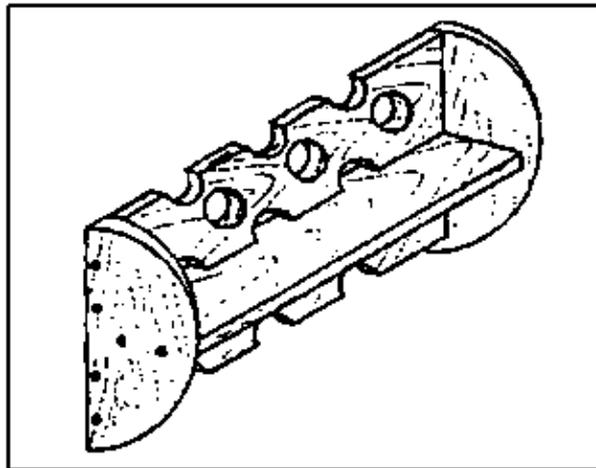
length: 160 mm

width: 80 mm

thickness: 20 mm

– 12 flat head wood screws

– 4 wooden dowels



Machines and tools

Bench or pillar drilling machine, pencil, awl, drill with centering drill point according to the dowel and screw size, countersink, screwdriver, wooden hammer

Measuring and testing means

Folding rule, marking gauge

Auxiliaries

Clamping means, cold glue

Necessary basic knowledge

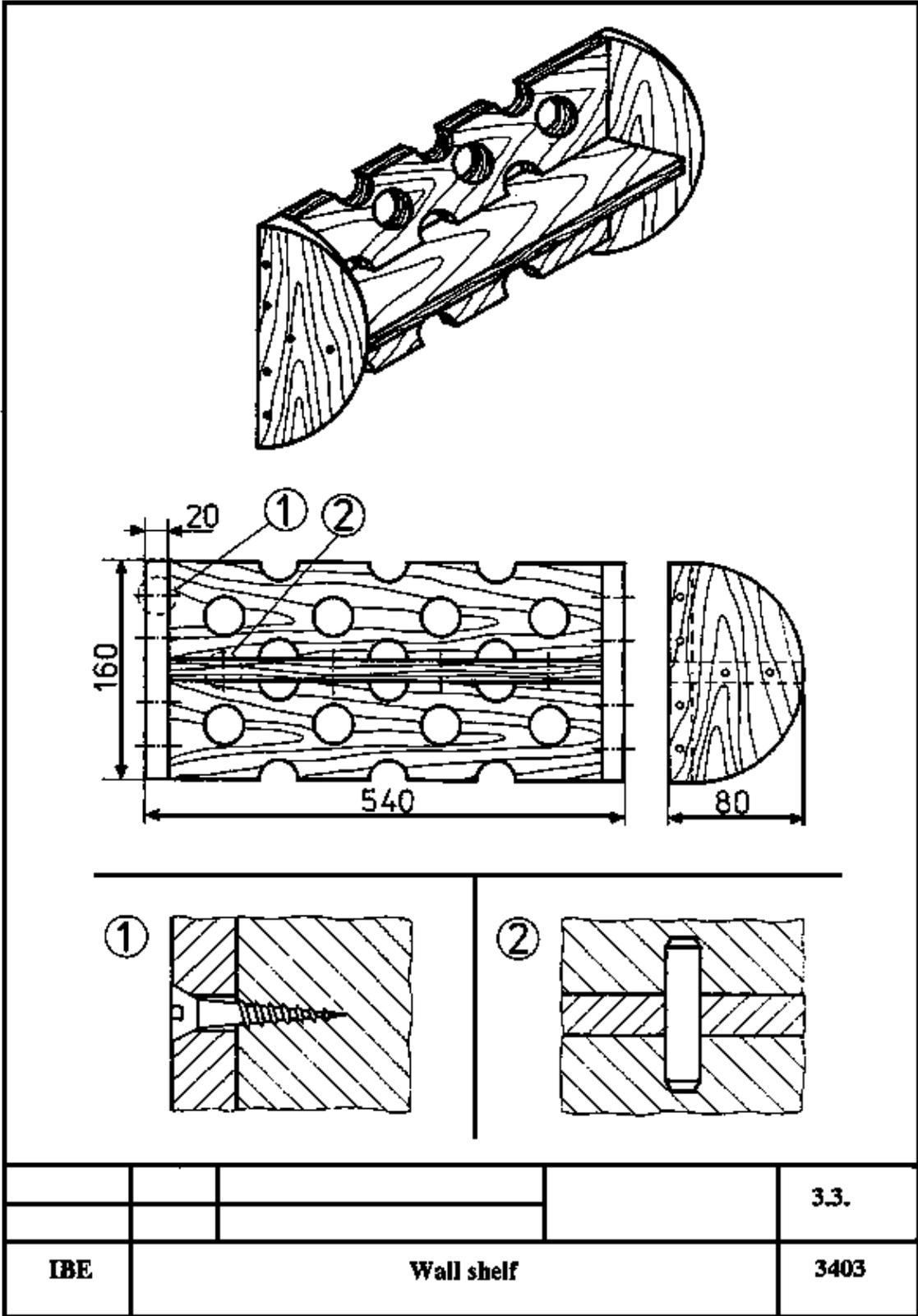
Measuring and marking

Sequence of operations

Comments

1. Preparing the working material Checking the machine for functioning Check for completeness

2. Marking and marking out the bores for the wood joints Determine the bore distance yourself!
3. Clamping the drill and drilling the through hole and bottom bores Selecting the drill according to the size of the screw and dowel diameters!
4. Clamping the countersink and countersinking the side boards for accommodating in the screw head
5. Manufacturing the dowel joints
6. Manufacturing the screw joints
7. Checking the joints for stability and cleanliness



Wall shelf