

## **Drill press**

### **Background**

You can use a drill press with many different types of workpiece. The machine allows you to drill holes in wood and metal with high precision and great versatility in terms of tools and stock. There are drill presses in most woodworking workshops, and they come in many different shapes and sizes. The most common types are floor standing, but smaller benchtop models are also available.

For woodworking, there is also the radial drill press. In a radial drill press you can adjust the angle and position of the drill head, so the distance between the tool centre and the column is greater than in a standard drill press.

### **Stop and think!**

You cannot use the drill press for milling, sanding or polishing. The tool can be moved while the drill press is running, which means the machine can cause severe injuries.

### **Machine structure**

The components of the drill press are described below.

#### **Frame**

A frame with a vertical column and a base.

#### **Table**

A table to which the workpiece is clamped.

#### **Drill head**

You can attach different tools to the drill head. The drill head consists of an electric motor, a gearbox and a spindle with chuck. The gearbox allows you to change the speed according to the workpiece and the size and type of the tool. The speed setting is changed with levers, by changing belt pulleys, or by changing gear wheels.

The speed setting must be clearly marked on the machine.

The drill head and the table can both be moved up and down the column along a rack. The table and the drill head must both be locked while the machine is in use.

#### **Spindle**

The spindle is raised and lowered with a downfeed lever which drilling. You can adjust the drilling depth with an adjustable stop on the spindle.

#### **Drill chuck**

A conical arbour fixes the chuck to a socket in the spindle. The conical arbour has a flat end to prevent the chuck rotating and working loose while the drill is running. The chuck in turn fixes the tool to the spindle, usually with three jaws which grip the tool shaft. Chucks are available with more or fewer jaws.

Depending on the type of chuck in the spindle, you can either fix the tool by hand (known as quick chucks, for which no chuck key is necessary) or using a spring-loaded chuck key. The tool can be tightened more securely in chucks of the key type.

To remove the chuck from the spindle, release a latch and then push out the chuck using the downfeed lever. You can also tap a special wedge into a hole in the spindle then push out the conical shaft.

### **Stop and think!**

Large twist drill bits often have a conical shaft and are fixed directly to the spindle without a chuck.

Because the chuck is installed with a conical shaft, there is nothing stopping the chuck and the tool working loose unless sufficient downforce is applied while the tool is turning. For example the chuck can loosen in the presence of vibrations or lateral forces. This is why the drill press must not be used with drum sander attachments, milling tools, rotary rasps or files, unless the machine is specially designed to do so.

### **Tools**

You can use many different tool types in the drill press. Here are a few examples.

- **Twist drill bits** are available with or without a centre point. Drill bits without a centre point can be used in woodworking, but only in sizes below 6 mm – they are actually mainly intended for metals and plastics. Twist drill bits with a centre point are good for drilling into wood and are available in sizes 3–20 mm.
- **Spade drill bits** are flat drill bits with two cutters and a centre point to guide the bit. The spade drill bit can be used at high speed to create a clean hole. Once the centre point is no longer guiding the bit, the bit can start vibrating. That is why you should keep up the speed while drilling and stop the machine the moment you raise the drill bit.
- **Countersink bits** are used to countersink screw heads. They are available with a range of cutters for various materials.
- **Knot removers** can correct defects in the timber and are available in sizes 8–60 mm. This drill bit creates clean holes and should be used at slow speed. Knot removers can also be used for normal drilling and are often the best solution for large hole diameters.
- **Plug cutters** are used to create plugs across the grain of the wood. These drill bits are available in sizes 10–60 mm.

Normally you should choose a low speed when using tools with a large radius or when drilling into a hard material. Drill press speeds typically range from 100–3000 rpm.

### **Stop and think!**

You must only ever use drilling tools in the drill press.