



BENZ for Beginners

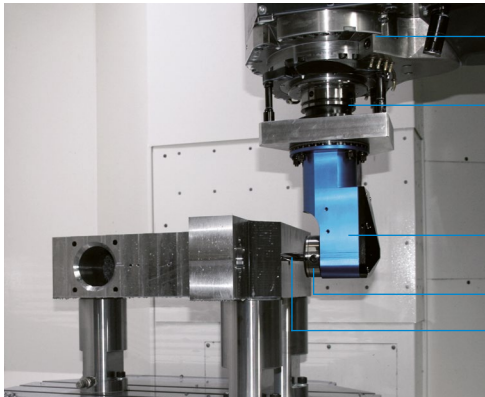
The company and its products – an easy explanation

TURN YOUR FUTURE
INTO SUCCESS

1 BASICS

BENZ tooling systems enable their users to manufacture products at an industrial level on their existing machines. They use the machines they have, in combination with BENZ tool holders, to manufacture more efficiently and diverse.

View inside the machine



- Machine spindle
- BENZ tool holder**
- Machine connection
- Front unit
- Tool output
- Tool e.g. drill

GET CONNECTED

Tooling system – What’s that?

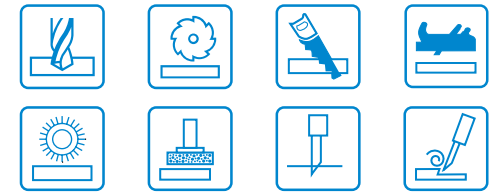
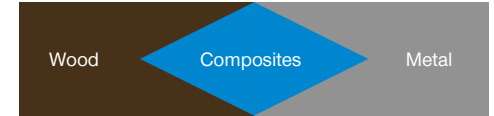
A tool holder **connects the machine with the actual tool**, e.g. a drill. This connecting part gives the customer the possibility to use one machine for different production processes such as drilling, milling, turning or grinding.

What can be machined with BENZ products?

BENZ products can be divided into “wood” for woodworking machines and “metal” for metalworking machines.

Each material requires individual machining, based on its properties. Metal is harder than wood. Different power (or torque) is needed to machine each material.

Furthermore, BENZ tools are also used to machine composite material e.g. chipboards coated with plastic.

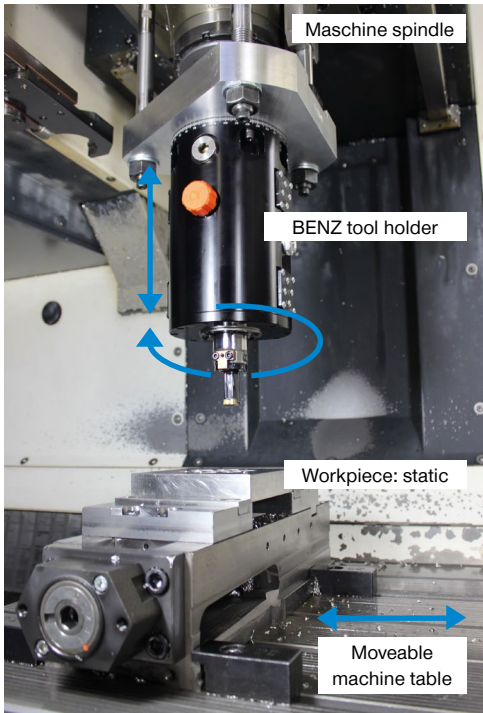


Make sure you understood the function of BENZ tools holders in reference to the connection between the machine and the tool. If you did, it will make the rest of these pages a walk in the park.



2 DIFFERENCES

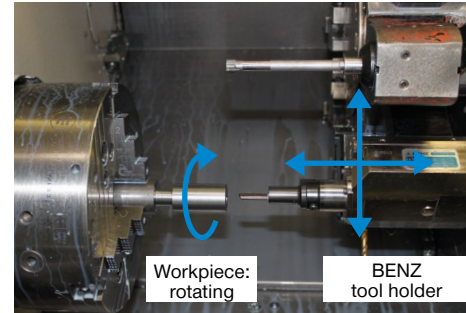
TYPES OF MACHINES



Machining center

Our customers' machines can be separated into machining centers and lathes.

The main characteristic of a machining center is the **fixed position of the workpiece** whereas **the spindle performs the production process**. This type of machine is supplied with a CNC -Controller, which allows automated production. This means the controller works as an operator and controls the production steps. Workpieces produced with machining centers are shaped cubical.



Lathe

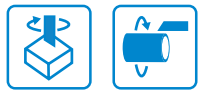
Unlike workpieces produced by machining centers, those produced on lathes are round or axially symmetric. On a lathe, the **workpiece rotates** and therefore **performs the cutting motion**. The tool holder and the tool are mounted directly on the turret, which is also called a revolver. With the forward motion of the cutting tool of the turret the abrasion of material starts.

Summary: Milling means the tool rotates yet the workpiece is static, fixed on a table which can be moved in a longitudinal and transverse motion. Turning on the other hand, requires a rotating workpiece and the tool performs the longitudinal and transverse movement.



3 PRODUCTS

MULTI-SPINDLE HEADS



Imagine you are baking cookies. Now think of how much time you could save if you were able to not only cut one but multiple cookies at a time. This is where the BENZ multi-spindle heads come into play.

The goal: safe time

Of course, we don't have any customers cutting cookies – but they DO want to save time. Our multi-spindle heads allow the customers to drill several holes or cut several threads simultaneously.



Now you know the benefits of a multi-spindle head and the time saving benefits it offers when producing workpieces with similar patterns. Multi spindle heads are used for both machining centers and lathes.

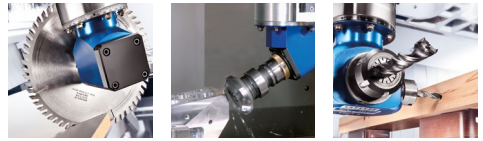
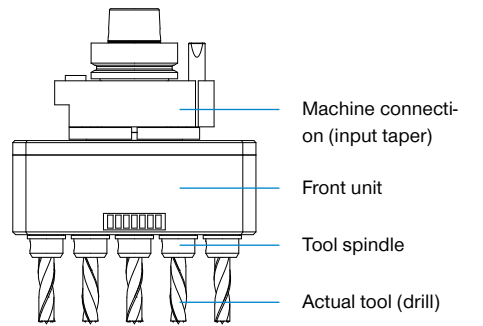


Learn about their design:

A multi-spindle head consists of three parts: a **front unit** with a matching **tool output** and a **machine connection**. For the technical specifications it is important to know what application the customer wants to perform in which material.

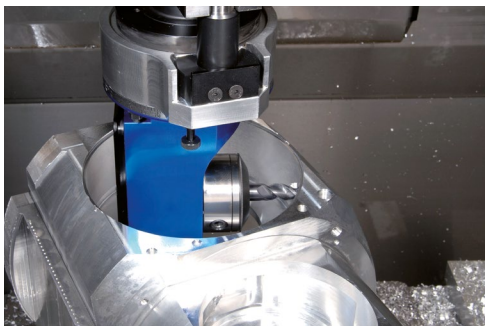
The machine connection, or input, ensures a proper fit into the machine and the necessary stability, which is why it is manufactured individually for each machine. The tool output spindle is what holds the tool and drive them in a rotating motion.

Different tool outputs make it possible to hold a wide range of **tools**, from drills to end mill cutters or saw blades.



3 PRODUCTS

ANGLE HEADS



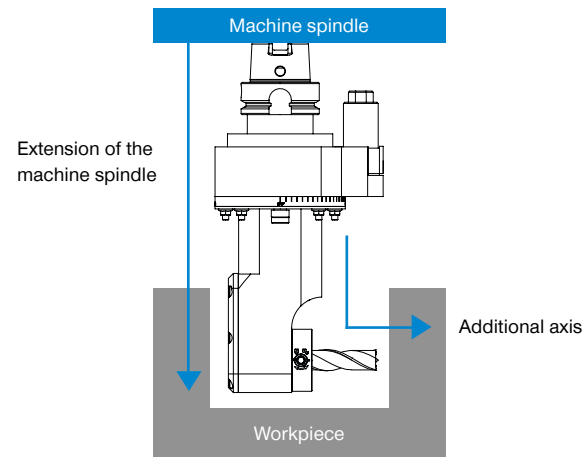
A typical application of the BENZ angle head: diving into a narrow workpiece, which couldn't be done with the machine spindle itself.

Another line of products are our Angle Heads, which are used on machining centers. By using angle heads difficult machining processes like machining in tight spots, can be performed.

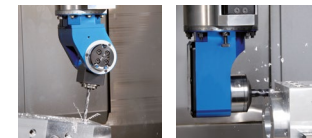
Tight spots are created when the size of the machine spindle is too large to fit into a small space on a workpiece, the tool cannot reach the spot on the material to be machined.

Extending the reach of the machine spindle and increased flexibility

The angle head does both, **extending the spindle to dive into a narrow workpiece and creating an additional axis**. Thereby the angle head can be built in a variety of executions, depending on the customers' needs.



Further applications



Vertical

Horizontal



Any angle (adjustable head)

Fixed angle (head with a fixed angle)

Remember, an angle head is used if an additional axis is needed, a defined angle is supposed to be machined or the machine spindle does not have the necessary reach.



3 PRODUCTS

LIVE TOOLS



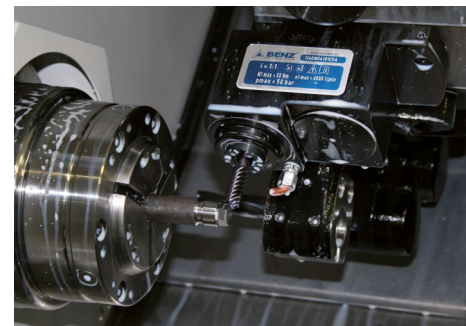
Tool holder

Turret

Live tools are only used on lathes.

It's rotating

With live tools it is possible to machine multiple sides of one workpiece, thereby saving time. Treads, grooves, drilled holes etc. can be machined. The rotation of the tool (such as a cutter) is driven by the live tool, which is driven by the turret motor.



Complete machining of products

If several live tools are clamped into the turret of the lathe it is possible to machine several production steps without having to change the tool over manually. Depending on the production step, the correct tool gets chosen. First comes rough machining (called roughing), after that the fine machining (finishing) is done.

Remember, a turret is also called a revolver, because similar to the real revolvers in old Westerns it rotates a magazine. Except in this case the magazine does not hold bullets but tool holders with tools.



INDIVIDUAL STANDARD



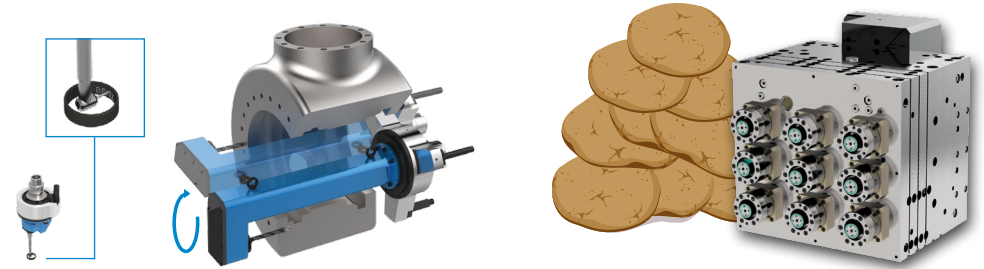
A product which fulfills all the customer's special needs: when custom tools are needed the R&D department is in demand.

Multi spindle heads, angle heads and live tools are offered in a number of **standard designs** as catalog products. But they also are **designed specifically to the requirements of the customers.**

A lot of our customers use BENZ products for serial production e.g. the automotive sector. In addition to the time savings, a precise and reliable machining process is essential, despite extremely demanding processes.

Hence, our R&D-team constantly optimizes our products to be able to guarantee high standards.

FROM EXTRA SMALL TO EXTRA-LARGE



To give you an idea of the variety of sizes BENZ products can have, we chose two examples. One of our customers' requirement was to engrave the inside of a finger ring. This means the tool and the tool system need to be **very small**.

The - **so far largest** - tools BENZ has built are used for manufacturing of wind turbi-

nes. Each component of a wind turbine is big and therefore, the tools to machine these components are big as well and weigh a significant amount. One of the BENZ tools weighs about 2.6 tons. That's about the same weight as 130.000 of your homemade cookies (20g per cookie).

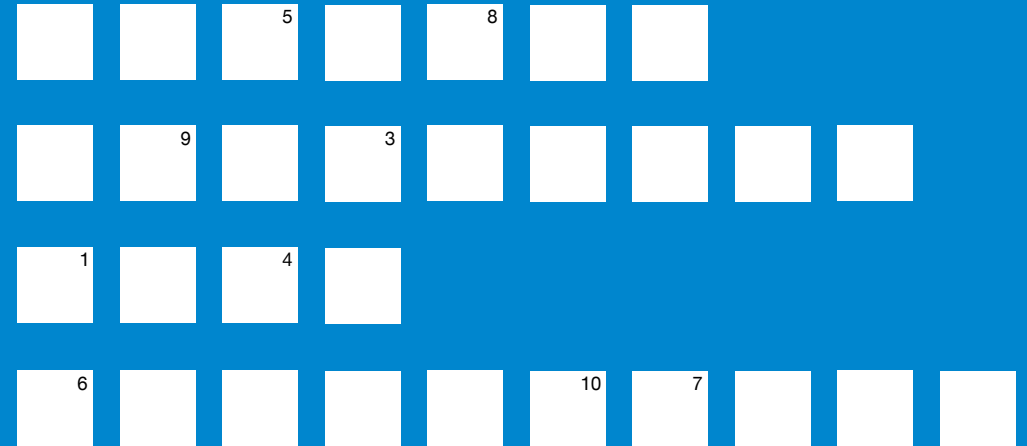
Now you know, size and weight of BENZ products vary depending on their usage.



THE BENZ QUIZ

1. Benz products connect the tool and ...?
2. This product is used on a machining center.
3. Angle Heads extend the reach of the machine spindle and create an additional ...
4. BENZ has customers of various industries such as aviation, machine tool manufacturing or ...

Want to learn more? This brochure gave you an overview into our most important product lines. You are still thirsty for knowledge? Please visit our website!



Solution



KONTAKT

BENZ GmbH Werkzeugsysteme
Im Mühlegrün 12
D-77716 Haslach

T +49 7832 704-0
F +49 7832 704-8001
ausbildung@benz-tools.de
www.benz-tools.de

