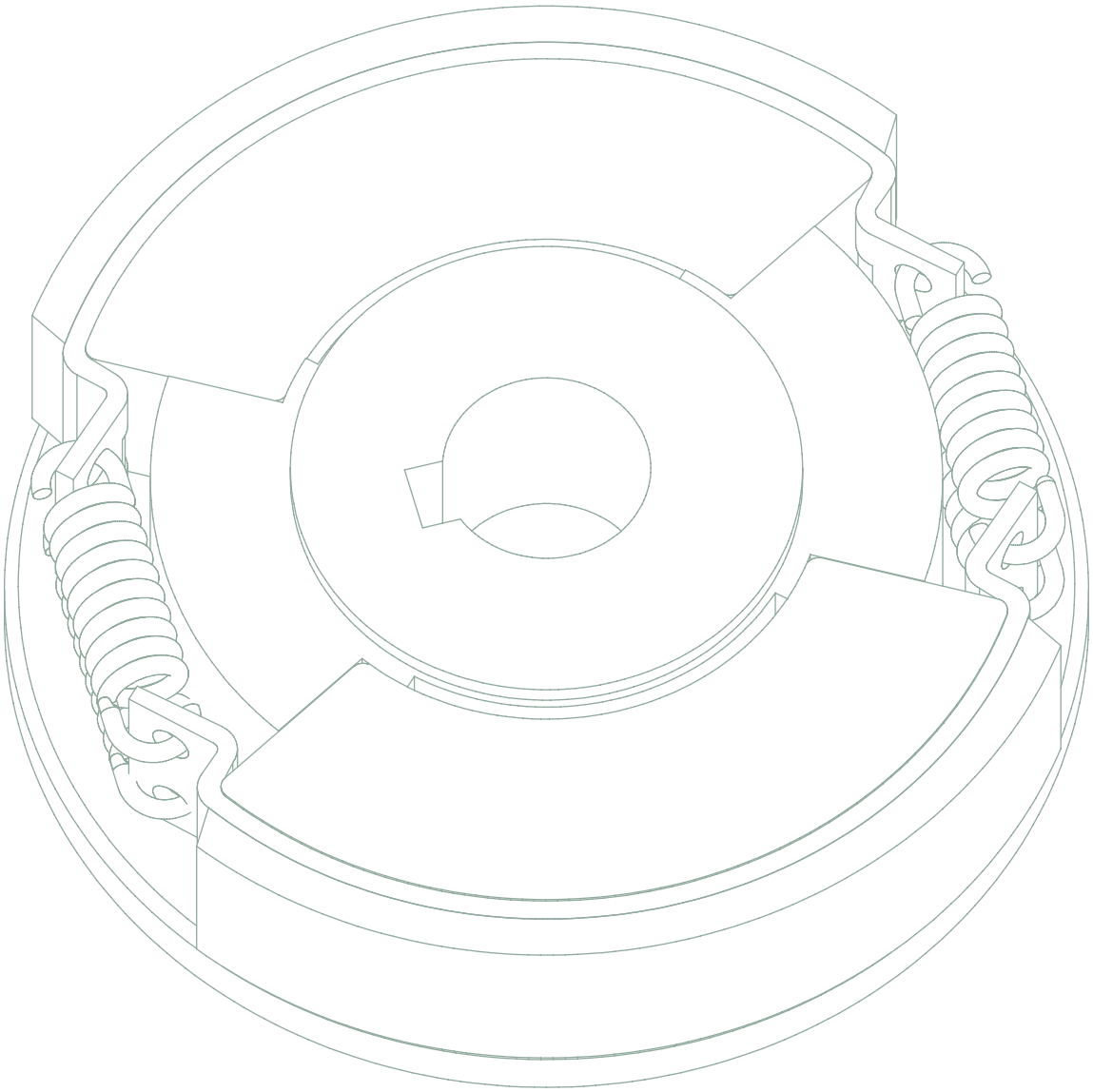
AMSBECK

Maschinentechnik



Controlled dynamics

Centrifugal brakes

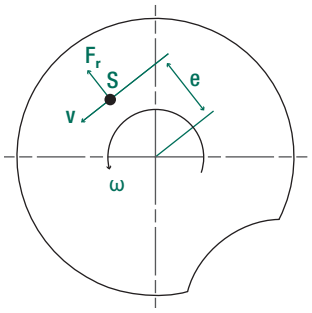
Experts in our field since 1982.

Strong brakes ensure reliability – our centrifugal force, your safety!

Amsbeck Maschinentechnik GmbH is a leading manufacturer of clutches and brakes based on the simple and effective functional principle of centrifugal force.

We revert to the principle, first deduced in 1669 by Christian Huygens, that a radial force acts on rotating masses. This force rises with the square of the angular velocity and is calculated according to the formula:

$Fr = m * \omega^2 * r\ [Nm]$



Combined with a suitable frictional partner, we use this force to build up a torque according to the formula:

$T = Fr * \mu * r\ [Nm]$

This together with the speed causes an activation of the clutch without additional measurement readings, control and external energy. Additional expenditure and costs for electrical, hydraulic or pneumatic control units can frequently be avoided.

Since 1982 we have been developing and customising a large variety of different executions for brake applications with axial or radial transmission.

Our team of highly qualified and experienced employees produces and sells brakes all over the world from the Everswinkel location in the heart of the Münsterland region.

The usual sizes work on an effective diameter between 60 and 250 mm and reach high braking torques.

We offer advanced, tried-and-tested and long-lasting drive solutions at extremely good value for money and for various different markets. Our products stand for dynamics and safety.

Tell us what you require – and we will provide the solution swiftly and competently.

Susanne Weritz, manageress

Zastoupení pro Českou republiku: BMC-TECH www.bmc-tech.cz info@bmc-tech.cz | +420 545 226 047 odstředivé spojky

Centrifugal brakes

Functional principle

Guided weight elements set in rotation are exposed to a radial force component, which accelerates them outwards. This force is compensated by spring forces up to the defined engagement speed.

At engagement speed, the friction linings are in contact within the housing and the torque build-up at the housing begins. Increasing the speed leads to quadratically increasing forces and thus to increasing torques. The brake is located in the beginning of the working area. The working area is between engagement and the torque balance between load torque and brake torque. This torque balance must be in the sliding area of the brake.

As long as the spring force outweighs the centrifugal force, the system will work without contact and without losses. So as not to impair the function, any grease, oil and moisture are to be kept away from the friction surfaces.

Through varying the spring design, the friction material, the overall size, the number of parallel elements and the operating speed, the engagement speed and brake torque are determined and adapted to the respective case of application.

Engagement

The engagement speed generally depends on the balance of load torque and brake torque. Since the power of a centrifugal brake increases quadratically as the speed rises, a minimum operating speed of the brake system is necessary.

The engagement speed of a centrifugal brake describes the speed at which the mass of the centrifugal weights, through the centrifugal forces acting on these, overcomes the retention force of the springs. By choosing springs of different strengths, which retain the centrifugal weights for different amounts of time, the engagement speed can be varied. These factors mean that a centrifugal brake cannot brake a system to a standstill; often they serve as speed limiters.

Based on our many years of experience, the engagement speed is set so as to reach a balance between load torque and brake torque in operation.

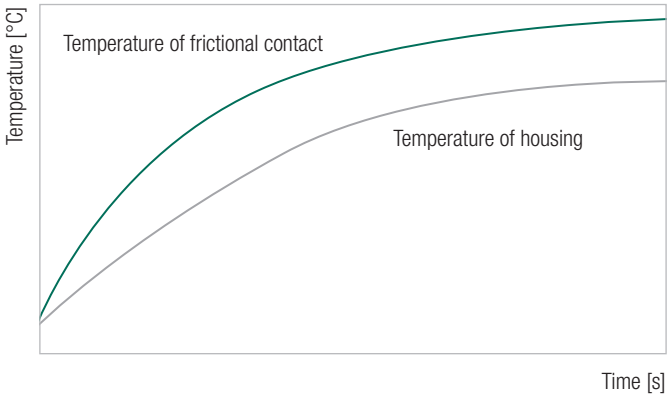
Dimensioning

Centrifugal brakes are usually safety-relevant components, and as such a careful design and consideration of the operating conditions are absolutely essential.

As well as the respective application, the following parameters are therefore also important for the correct design of the centrifugal brake:

– Operating speed
– Engagement speed
– Frequency of braking procedures
– Duration of brake application

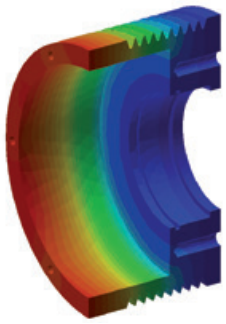
Temperature development of a centrifugal brake



Heat

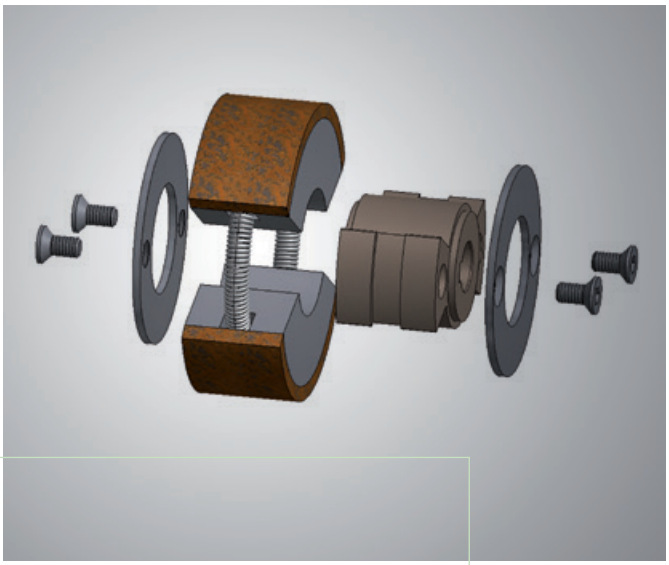
Friction generates heat, and a centrifugal brake converts the performed friction work completely into heat. The heat develops directly in the frictional contact and mainly heats the material directly involved in the frictional contact (see fig.). The generation of heat is dependent on the operating conditions in each case as well as on the following factors:

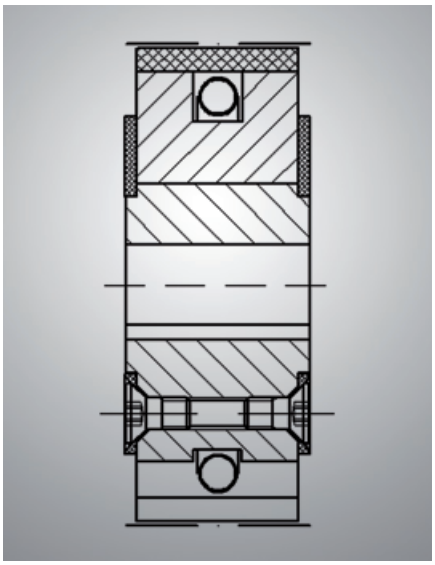
– Brake torque
– Size of friction surface
– Mass of the brake housing



Thermal conduction leads to heat distribution within the entire brake.

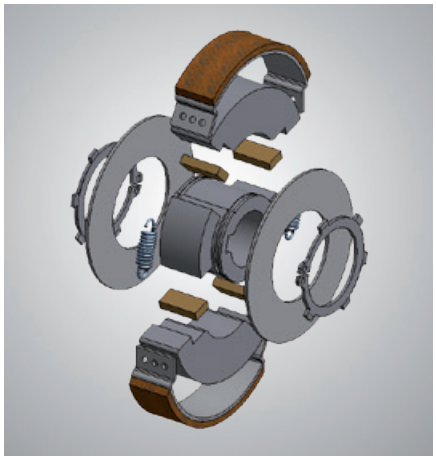
The temperature curve rises strongly at the beginning of braking and flattens as time progresses, until a maximum is reached. When designing a brake it is to be ensured that the maximum permissible temperatures in the frictional contact are not exceeded, since there will otherwise be substantially increased wear at the friction lining. Such thermal overloading causes the friction coefficients to change significantly and can have a negative impact on the function of the brake. Due to the surface temperatures that arise, protective devices may be necessary in the brake area.

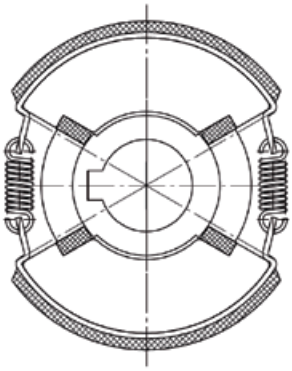


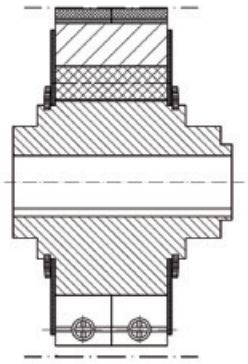


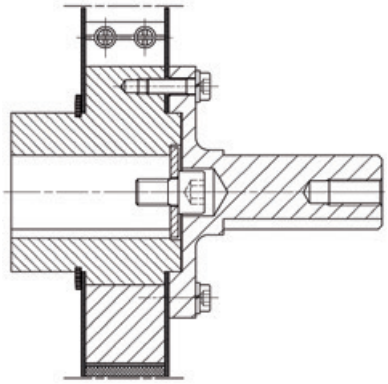
Execution without housing

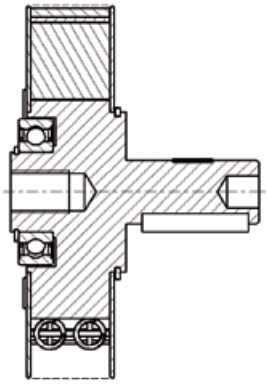
Amsbeck has various executions in the range for various different drive engineering requirements. Our brakes offer optimal safety for your application.

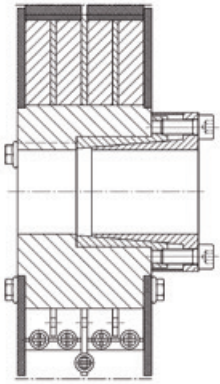








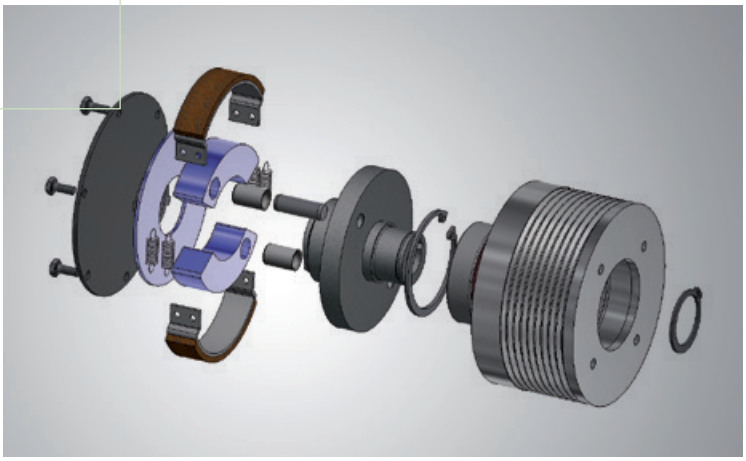


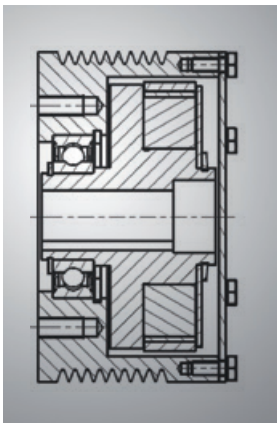


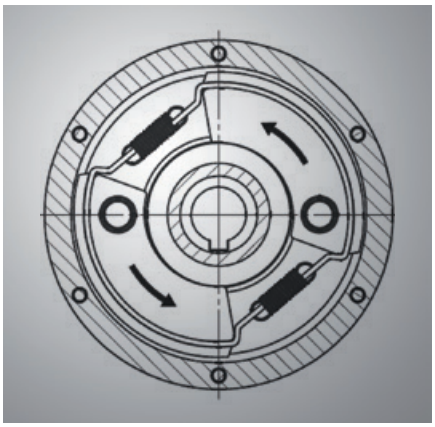
Amsbeck heißt Vielfalt

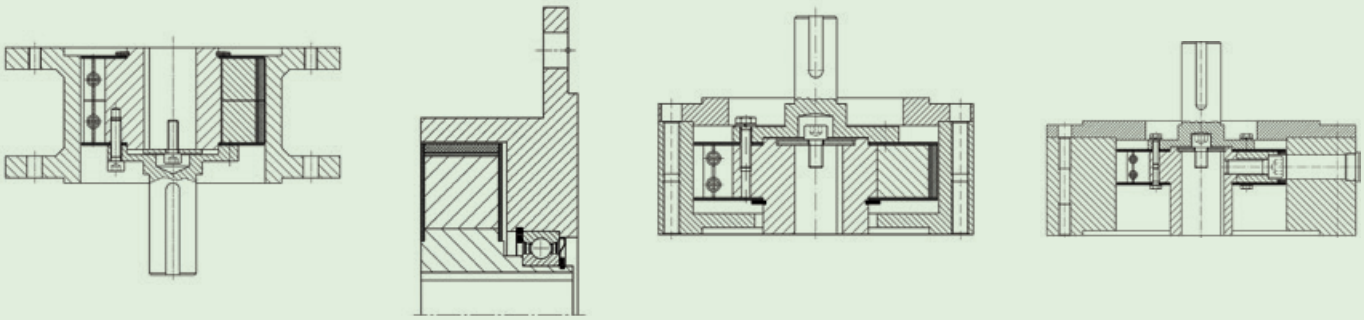
Execution with housing

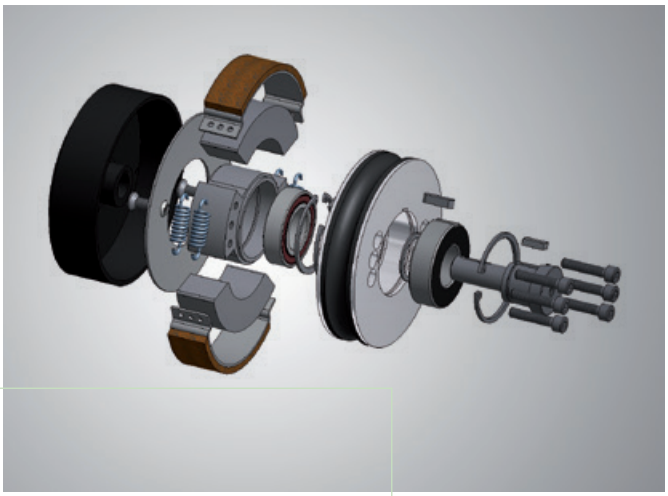
In line with the respective application, we will also provide you with the housing for the centrifugal brake. This means you get an optimally functioning brake system from a single source.

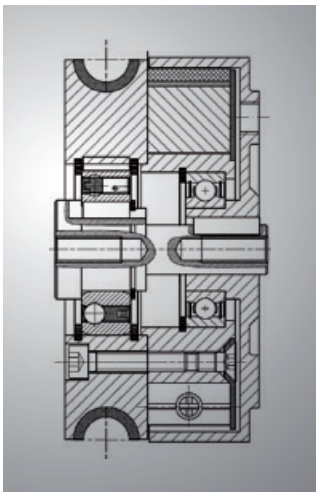






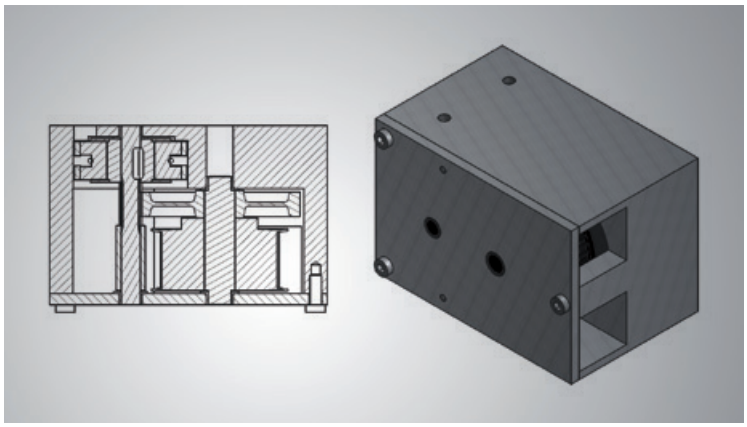


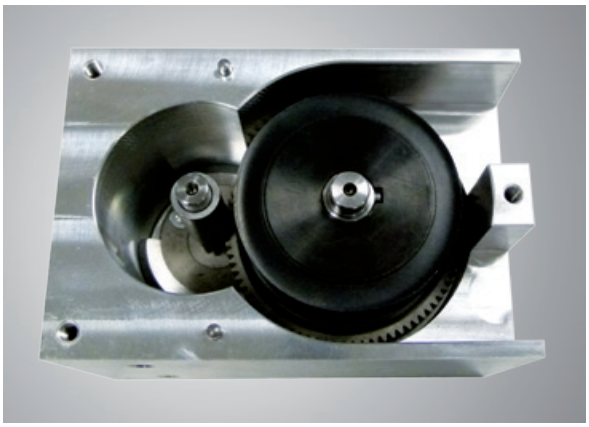


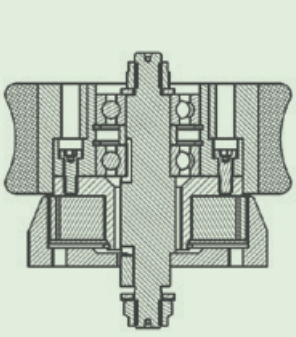


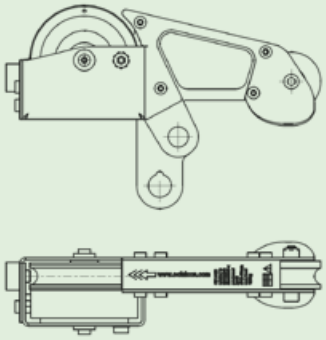
Complete execution

You will find that we are also the right partner when it comes to complex safety devices. We will gladly provide you with complete and ready-to-install subassemblies or subsystems for your respective applications on request.









Fields of application

Safety engineering

Selected applications

Our various fields of application

– Fun sporting
– Rescue equipment
– Renewable energy generation
– Safety engineering
– Recreational sport
– Gate systems

Rescue equipment

Fun/Recreational sport

Gate systems

Quote request for centrifugal brakes

AMSBECK

Quote request from company: _____

Contact: _____

Telephone: _____ Fax: _____

Email: _____ Website: _____

☐ **Type no. known** Type no.: _____ Quantity: _____ Price/item: _____

☐ **Type no. unknown** Brief description of application: _____

Manufacturer, motor type: _____

Idling speed [rpm]: _____ Drive power: ☐ kW ☐ HP _____

Max. moment [Nm at rpm]: _____ Operating speed [rpm]: _____

Engagement speed [rpm]: _____ Working machine: _____

Connection to motor

☐ **Cylindrical shaft** Diameter: _____

Groove width: _____

Length: _____

☐ **Conical shaft** Diameter: _____

Taper ratio: _____

Taper angle: _____

Taper length: _____

☐ **Flange** Pitch circle-∅: _____

Number of boreholes: _____

Borehole-∅: _____

Centering: _____

Output through

☐ **cylindrical borehole** Diameter: _____

Groove width: _____

Length: _____

☐ **Belt** ☐ SPA ☐ SPB ☐ SPC ☐ SPZ ☐ Other: _____

Diameter: _____

Quantity: _____

Counter pulley-∅: _____

Axial distance: _____

☐ **Hole pattern** Pitch circle-∅: _____

Thread: _____

Centering: _____

Please note other connections or outputs here: _____

Quantity: _____ Price/item: _____

Amsbeck Maschinentechnik GmbH
Boschweg 15 | 48351 Everswinkel

Phone +49 (0)2582 66812-0
Fax +49 (0)2582 66812-101

info@amsbeck-mt.de
www.amsbeck-mt.de

Zastoupení pro Českou republiku: BMC-TECH www.bmc-tech.cz info@bmc-tech.cz | +420 545 226 047 odstředivé spojky

Do you need special solutions?

We like a new challenge – please contact us.

Centrifugal brakes Edition 2015 © Amsbeck Maschinentechnik GmbH

Further product information available

Find out also about our:

Centrifugal clutches | **Gearboxes** | **Hydraulic multiple disc clutches** | **Electromagnetic multiple disc clutches**

Amsbeck Maschinentechnik GmbH
Boschweg 15 | 48351 Everswinkel

Phone +49 (0)2582 66812-0
Fax +49 (0)2582 66812-101

info@amsbeck-mt.de
www.amsbeck-mt.de

We are certified in accordance with:
Testing standard ISO 9001:2008
Certificate reg. no.: 09 100 50 59

Zastoupení pro Českou republiku: BMC-TECH www.bmc-tech.cz info@bmc-tech.cz | +420 545 226 047 odstředivé spojky