

# ALMÜ® INSIDER

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Issue  
July 2008

## Solid carbide drills: proven technology brought up to date

For the last twenty years, manufacturers have mainly used straight-fluted solid carbide drills with internal coolant supply when working with short-chipping materials. ALMÜ was one of the first companies to develop and produce such tools. Today, we want to show you that it is possible to increase the performance of straight-fluted solid carbide drills.

One of the technological advantages of straight-fluted solid carbide drills is their great rigidity that makes bore holes very straight. A disadvantage of this kind of tool, however, turned out to be the high axial and radial cutting forces.

To compensate these forces, the appliance as well as the machine tool, including the fixture, have to be very rigid. Compared to a spiral drill, the drilling moment doubles, as well as the necessary spindle power. Thus, the drive mechanism, and in some cases the gears of the drill head, have to become larger.

The aim of our new development was primarily to reduce the cutting forces by optimizing the geometry of the cutting edges. However, the challenge was not to use chip breakers, as this can limit the possibility of resharping.

Our solution are concave shaped flutes in combination with four circular guiding pads. This development brings considerable advantages in geometry, makes the hole rounder, and enhances the quality of the surfaces.



Photo:  
Straight-fluted solid carbide drill with modern concave flute geometry.

### The result can be characterized by the following details:

Polished chip spaces reduce the coefficient of friction, and enhance the chip flow.

An additional concave shaped flute improves the chip forming process. The effective cutting angle becomes smaller, which is why the tool can cut more softly. The torque is reduced by twenty percent.

Cutting edges rounded by some 10 µm reduce microscopic disruptions.

Regrinding is only carried out at tool flanks 1 and 2, and can thus be carried out by every resharping company.

## ALMÜ® IN-HOUSE



In this issue, we talk to Philipp Schindler, who finished his apprenticeship as a machinist specialized in milling technology two years ago. Philipp Schindler was trained with ALMÜ for three and a half years, and now attends advanced evening classes to become a master professional of metal technology.

You find the interview on page 2.

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forward to meeting you!

**Photo:**  
The end-to-end concave flute improves the chip forming, while the tool can be easily resharpened.



This issue's practical example shows how truck manufacturer MAN uses our advanced solid carbide drills. The component we will show you is a cylinder head platform for the motor series D20 and D26.

This modern generation of motors with common-rail injection, four-valve technology, and cooled external exhaust-gas turbocharging is mostly used for heavy trucks such as the MAN TGA and MAN TGX.

The workpieces are processed at machining centers with multi-spindle drill heads with three spindles. The main criterion is that the power received remains unchanged over the entire process, as overload peaks would lead to an automatic switch-off of the machine. This should prevent tool fracture.

We can fulfill these requirements with one of our straight-fluted solid carbide drills.

**MAN confirms the following key data:**

Running life could be improved from 300 minutes to 500 minutes.

The machine did not switch off due to overloads.

The tool can be easily resharpened.

The running life of the resharpened and recoated tool is near 100 percent.

Thus, thanks to the enhanced version of the tool we just presented, we can keep looking forward to further years of successful partnership with the automotive industry.



**ALMÜ®**  
**FACTS**

**The new common-rail motor technology: power to move big vehicles.**

The latest chapter on future-oriented diesel engines is entitled D20/D26. This is the most modern engine range in Europe with common-rail injection, four-valve technology, exhaust-gas turbocharging, air/air intercooling, and

cooled external exhaust gas recirculation, as well as the EVB engine brake. Outstanding in its power and quietness, environmental compatibility, efficiency and economy, these six-cylinder units have become a major your success. The D20/D26 engines get more power out of the fuel, consuming some five percent less diesel. They're low on weight, too, about 100 kg lighter than their predecessors D28. On the exhaust front, they are lastingly cleaner than Euro 4 requires, and in terms of noise, they are so quiet that you hardly notice them.

Source: MAN

**Insider interview with Philipp Schindler**

**Insider:** Good morning Herr Schindler. For a young man like you, just after having finished his apprenticeship, with a job and a family to take care of, what is so exciting about taking classes three times a week, mostly in the evening, plus some Saturdays?

**Philipp Schindler:** First and foremost, to enjoy a great job. Then, the "lack of skilled labor" has been a much-discussed subject among friends. Moreover, my boss, Herr Müller, offered me an incredible perspective within the company, and I am laying the basis for that. I guess all that is reason enough.

**Insider:** What are your actual tasks at ALMÜ?

**Philipp Schindler:** After my apprenticeship, I joined the PCD department, where I do round and tool grinding, and I do eroding and soldering jobs. And for quite some time, I have been responsible for quality assurance.



**Insider:** A task that requires much responsibility. You are thus kind of the helping hand of ALMÜ's quality assurance manager. What exactly are the processes you take care of?

**Philipp Schindler:** I inspect random samples of the tools that are to be delivered to our customers. These quality checks happen during my normal work, and I have to decide myself when they are necessary. Additionally, I am responsible for internal and external checks of the measuring tools.

**Philipp Schindler is 21 years old, and lives in neighboring Bad Boll. For our quality assurance, we use, among others, a Walter Helicheck measuring machine, as well as various microscopes.**