**HORN Technology Days 2025**

**Efficient processing of modern materials**

**The alloying of lead in metallic materials has a positive effect on the machining process. Due to the EU's REACH and ROHS regulations, the time of these easy-to-machine materials is over in many applications. However, reliable machining must still be possible in the future. With its broad tool portfolio, Paul Horn GmbH has a suitable solution for almost every application.**

The main problem when machining lead-free alloys, be it brass or free-cutting steel, is the lack of reliable chip breaking. But what exactly is the effect of the alloy component lead, which is toxic to humans? During machining, the soft metal creates predetermined breaking points in the alloy, as lead forms small nests or inclusions in the alloy structure. These ensure good chip breaking and low cutting forces during machining. Furthermore, the heavy metal acts like a lubricating film, which has a positive effect on tool wear.

The changeover was initially a challenge. The good cutting properties of the lead-alloyed materials were lost. In addition, the wear on the cutting edge increased significantly. This was remedied by grooving and longitudinal turning with chip-breaking geometries from the steel sector and special laser-cut geometries. Extensive investigations show that chip-breaking geometries for steels with medium strength in particular work very well with lead-free materials.

During internal boring, adapted geometries also ensure reliable chip breaking. One of the biggest challenges in internal machining is long chips. These often occur during bore machining. They wrap around the tool, clog bores or, in the worst case, lead to tool breakage. Previously, specially lasered or ground chip form geometries were used for this purpose. However, this was associated with a corresponding cost factor for the cutting insert. With the new Type 105 Supermini and the Type Mini with I geometry, Horn has succeeded in developing universal boring tools with sintered chip form geometry. The tools offer high process reliability in use thanks to good chip control. The cutting edge geometry extends far into the corner radius of the insert. This ensures chip control even with small infeeds. The geometry can be used universally for different material groups and is suitable for internal, face, copy and reverse turning.

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Ein Bild, das Design, Meißel, Kunst enthält.

KI-generierte Inhalte können fehlerhaft sein.

**photo caption:** With the new type 105 Supermini, Horn has succeeded in developing a universal boring tool with sintered chip form geometry.

Source: Horn/Sauermann

Ein Bild, das Metall, Maschine, Autoteile, Stahl enthält.

KI-generierte Inhalte können fehlerhaft sein.

**photo caption:** Adapted cutting edge geometries provide a high degree of process reliability when machining lead-free materials.

Source: Horn/Sauermann

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