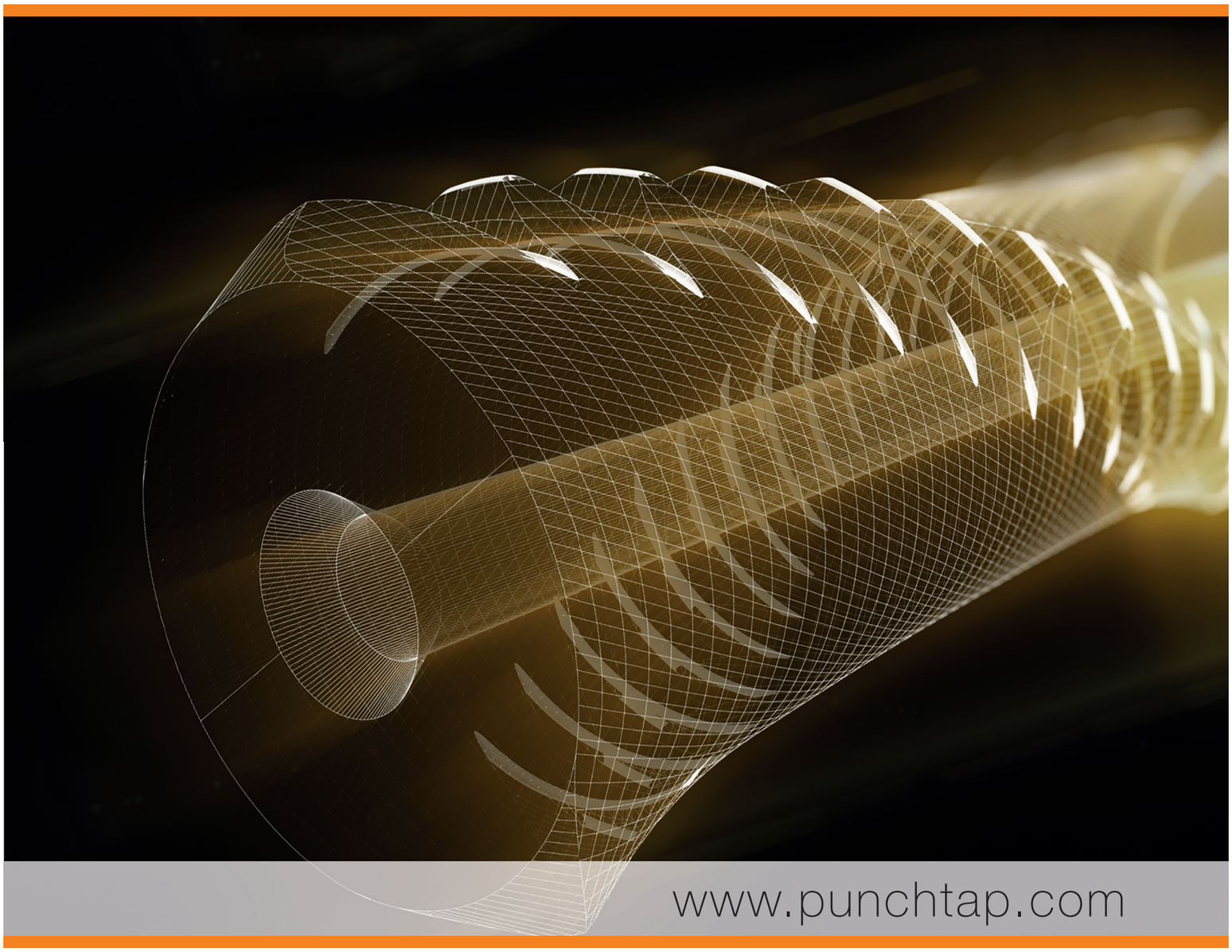
EMUGE Punch Tap



EMUGE FRANKEN

EMUGE Punch Tap – The New Thread Technology

EMUGE Punch Tap

GOAL

Reduce Cycle Time

In order to save machine capacities or to increase production output while maintaining the capacity, the main portion of time used for the production of internal threads should be reduced.

IDEA

Shortening of the Tool Path

Conventional taps and cold-forming taps follow the pathway of the thread geometry. The cutting or forming teeth of the tool cover a correspondingly long distance. To save time it is necessary to shorten the path of the tool.

SOLUTION

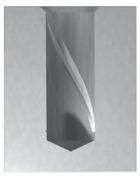
Innovative Production Technology

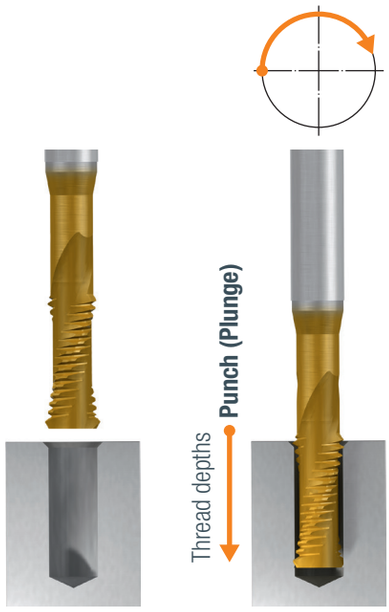
The new process consists of an innovative as well as an amazingly simple kinematics in three steps. Precondition is a pre-drilled tap hole in the workpiece with the respective pre-drill diameter.

Step 1: Punch (Plunge)

The Punch Tap does not have a continuous thread profile on the circumference but two rows of teeth which are offset by 180°. The first tooth of each row of teeth is responsible for producing the groove and thereby enables the first step of the process, the **helical plunge into the pre-drilled tap hole**.

Two helical grooves are generated in the pre-machined wall of the hole.





RESULT

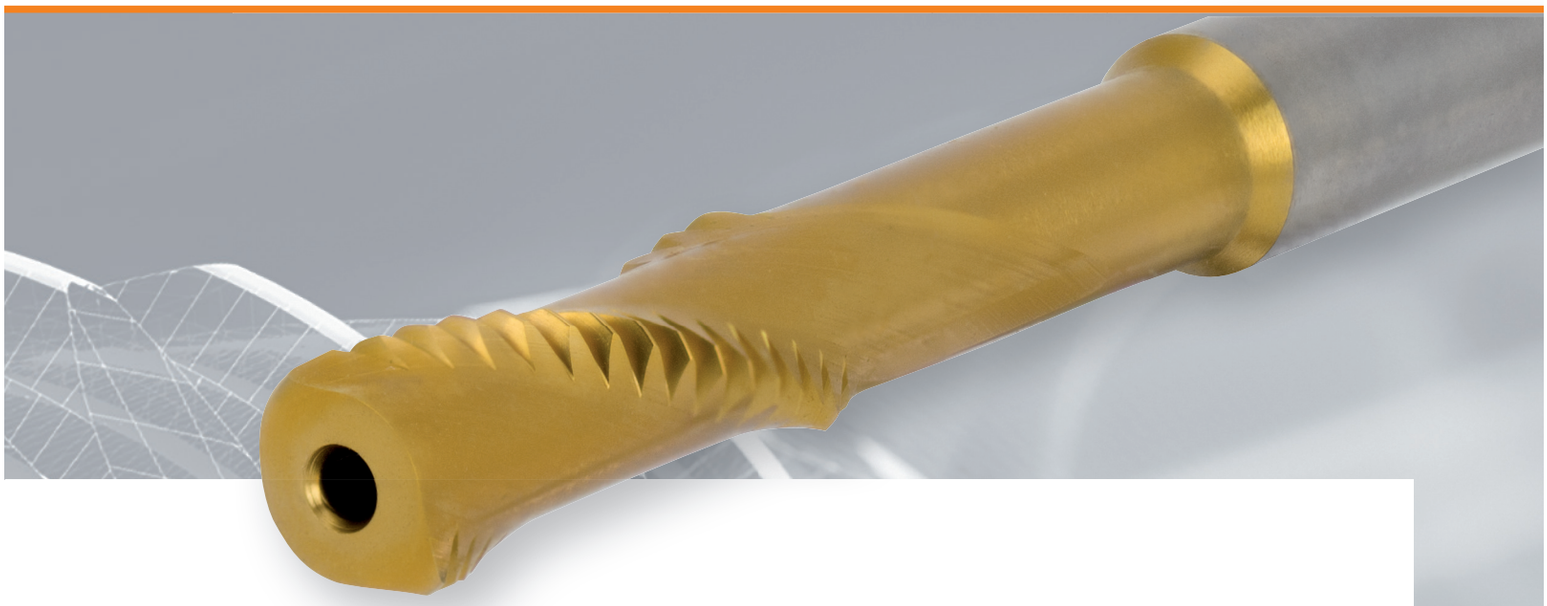
EMUGE Punch Tap – The Shortest Way

When comparing the tool path of the EMUGE Punch Tap with the tool path of conventional taps or cold-forming taps, it shows that the path is approximately 15 times shorter for a thread M6 with a depth of thread of 15 mm.

The result is a significant time savings up to 75% in a threading cycle.

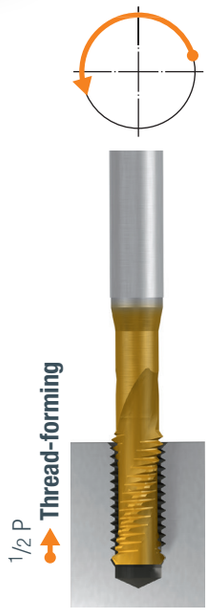
Studies at the ISF at the University of Dortmund show that the thread produced by the Punch Tap is comparable with a conventionally produced thread in terms of properties and pull-out resistance.

EMUGE PunchTap



Step 2: Thread-forming

Once the PunchTap has reached the depth of the thread, the **forming of the thread** starts which is executed by a synchronous movement of the feed axis by half of the pitch while simultaneously rotating the tool by approximately 180°.

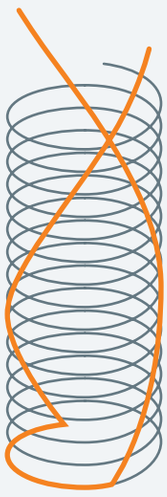


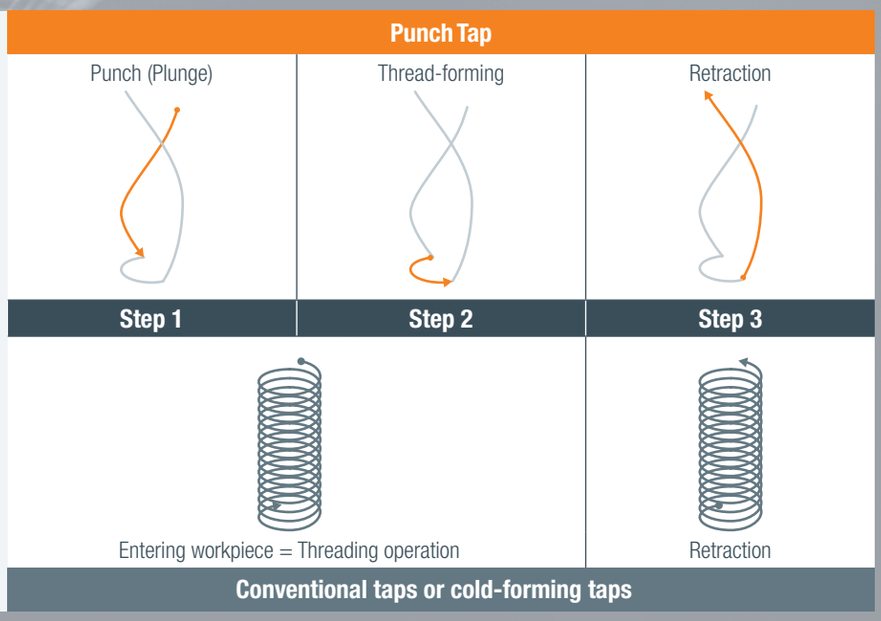
Step 3: Retraction

Once the thread-forming process is finished, the PunchTap is **retracted from the hole** through the generated grooves.

The result is a thread with two helical grooves.

Comparison of tool paths



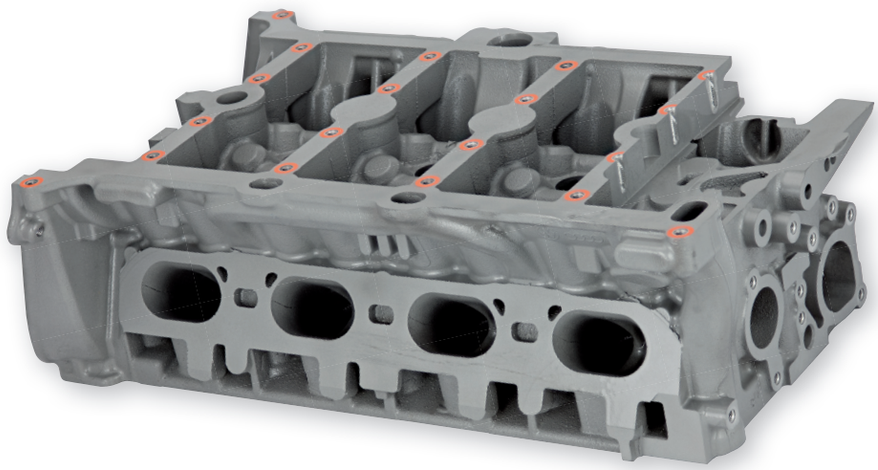


EMUGE PunchTap

Series Production

Cooperation of EMUGE-FRANKEN and Audi

EMUGE-FRANKEN and Audi joined to integrate the PunchTap technology into the series production of automotive components made of cast aluminium.



Literature References (only in German language)

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Prozesse I Innovationen I Werkstoffe
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