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**Slika: Principle of combined through the spindle delivery of CO2 and MQL**

**Slika: Combined delivery of CO2 and MQL in drilling**

REFERENCE

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PROBLEMATKA

* The processing of difficult-to-machine materials is due to their high thermo-mechanical tool loads and their high adhesion tendency possible just under low cutting speeds and using cooling lubricants.
* This results in long processing times, low productivity and high costs.
* The "cryogenic machining" in combination with minimum quantity lubrication represents an innovative approach for increasing productivity and step into direction for achieving dry and clean machining processes.

PRINCIP DELOVANJA

* Increase productivity in the milling and drilling of difficult-to-machine materials by using a combined supply of cryogenic media (CO2 and N2) and minimum quantity lubrication through the spindle.
* Analysis of the operating mechanisms and temperatures, as well as development of adapted process strategies and tools for combined, internal delivery of both mediums also for small solid tools.

Stanje tehnike

* Increase productivity in the milling and drilling of difficult-to-machine materials by using a combined supply of cryogenic media (CO2 and N2) and minimum quantity lubrication through the spindle.

Analysis of the operating mechanisms and temperatures, as well as development of adapted process strategies and tools for combined, internal delivery of both mediums also for small solid tools.

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