

## Transitioning to a waste-free production – international cryogenic+MQL machining activity

Circular Economy

Green Manufacturing

Low Environmental Footprint Systems

### Project consortium

**HSTec**  
HIGH SPEED TECHNIQUE

**TU** TECHNISCHE  
UNIVERSITÄT  
WIEN



Summary

High-value manufacturers looking for a competitive machining advantage need better cooling and lubrication that does not require substantial machine tool refits. With CRYO-MQL, end-users get state-of-the art (i) liquid nitrogen (LN2) and (ii) liquid carbon dioxide (LCO2) as a machining coolant – combined with solutions to deliver minimum-quantity lubrication (MQL) to a cutting zone for applications demanding higher productivity (faster material removal, longer tool life), and enhanced quality.

Developed through extensive fundamental research, LN2+MQL and CO2+MQL bring the patented methods of cooling and lubrication to end-use applications, enhancing developed solutions from TRL6 to TRL8. Demonstrated through pilots in the medical, aerospace, and steel-manufacturing industries, the realized KPIs and “technology-integration” solutions the CRYO-MQL offers, the end-users will be able to implement the technology (previously considered out of reach) in their plants easier than ever.

### CRYO-MQL concept & business canvas

