# CFD SIMULATION OF PARTICLE-LADEN FLOWS IN HILTI POWER TOOLS

## Problem Description

- During application of many Hilti products solid particles are generated and transported with the fluid flow, e.g., during grinding, sanding, drilling or hammering processes.
- These applications are generally associated with particle-laden flows ranging from dilute to dense flows with respect to the particle loading.
- Particle entrainment into the cooling flow of a power tool leads to solid deposition in dead zones and to erosion damage in regions with intensive particle-wall interaction causing a reduction in the expected life time of the tool.

## Objectives & Tasks

- Building up CFD models (geometry clean-up, meshing).
- Investigation of the flow field and the particle transport in a power tool for different boundary conditions and geometry modifications.
- Localization of particle deposition areas.
- Deriving of improvement suggestions based on simulation results in order to enhance tool performance and tool life.

## Required Skills

- Basics in the Finite Volume Method.
- Basics in particle mechanics.
- Experience in CFD (single- and multi-phase flow).

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**Location:** Kaufering

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