**Start Date: 01-APR-2020**    **Duration: 36 months**    **Operation Code: 45940**

# MCTool 21

**Manufacturing of cutting tools for the 21st century: from nano-scale material design to numerical process simulation**

**The premature degradation of cutting tool materials is one of the problems that aerospace and automotive industries are now facing. The MCTool21 project will improve the machinability of alloys through an innovative optimized coating system and new simulation tools.**

**Keywords: Cutting tool materials, coating systems, industry**



## Main challenge/problem the project seeks to address

Fabricating parts of cars and planes is hard on cutting tools and tends to ware them down. Additionally, increasing requirements on high speed and dry cutting applications open up new demands on the quality of cutting tool materials. Several solutions have been tried to improve the machinability of these alloys, being the application of thin solid films by sputtering techniques the most promising. However, it still has a long way to go to meet the need for high-speed machining and green manufacturing.

## Proposed solution

An optimized coating system which can be upscaled to industry and simulation tools to optimize the size, geometry as well as to predict the right machining parameters for improvement of the performance of the cutting tool directed to hard-to-machine materials.

## Innovative Potential

The project will develop special cutting tools with new and significantly improved features such as adaptability during cutting operations that will reduce the wear and tear inflicted by hard-to-machine materials on such tools. The innovation brought about by MCToo21 will translate into an increase in productivity and a reduction of production and maintenance costs for customers. Additionally, these smart tools will be made to last longer and perform much better than the tools available in the market.

## Target beneficiaries

Aerospace and automotive industries.

## Consortium

**PORTUGAL**
**Inovatools Portugal, Unipessoal, Lda. (Lead Beneficiary)**
University of Coimbra
University of Minho

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