
Optimization of CVD Charge building

Introduction

A hard metal insert is constructed with Tungsten powder mixed with Cobalt. Sandvik Coromant produces different inserts with different types of coating.

One type of coating is CVD (Chemical Vapor deposition), where a charge of thousands of inserts is placed in a furnace and chemically coated in high temperature. Today the charges are built manually by operators following basic directives that specify what rules to follow and how to build. A normal charge consists of multiple orders that has been combined depending of their basic characteristics such as size, process, priority, queue and type. This is a time-consuming task and is far from optimized since the operator must look through potentially hundreds of orders.

The Goal

Find the best suited way to optimize how the charge can be built to have the most utilization of the furnace without compromising quality.

Project Steps

- Project Planning
- Collect data from production databases
- Formulate the Function with input from Production Engineers/Operators.
- Look at different optimization methods for the problem
- Compare the results of the different methods
- Find software libraries that contains algorithms that support optimization methods for the problem
- Implement prototype
- Report the results

Practical Details

Prerequisites

It is expected that students working on this project have experience in optimization and numerical analysis. Programming skills is beneficial.

Tools

Sandvik Coromant will provide hardware and software for the project members to be able to perform the project tasks.

Working Routines

Will be set during Project Planning

Sandvik Coromant is a part of global industrial engineering group Sandvik and is at the forefront of developing manufacturing tools and machining solutions, with knowledge that drives the industry standards and innovations demanded by the metalworking industry now and in the next industrial era. Collaborations with educational institutions, extensive investment in research and development and strong partnerships with customers support the development of advanced machining technologies and systems that will change, lead and drive the future of manufacturing. Sandvik Coromant owns over 3100 patents worldwide, employs over 8,000 staff, and is represented in 130 countries.