



CQFA

CARREFOUR QUÉBÉCOIS
DE LA FABRICATION ADDITIVE

CASE STUDY

ADDBASE COATING DEVELOPMENT FOR NONSLIP ROLLERS

OBJECTIVES

To develop a coating that cannot be produced otherwise while integrating new parts features (gripping and wear resistance).

Project duration

2016-2018

Partners

Centre de métallurgie
du Québec (CMQ),
MBI Global (VersaDrill Canada)

Materials

Diamonds and metal matrix

Processes

DED (directed energy deposition),
Optomec LENS process
(laser engineered net shaping)

Application fields

Mining

BACKGROUND

When conducting underground mining exploration, core drilling is done using a set of tubes connected to a drill bit that digs the hole while sending the cored soil into the tube. These tubes are extracted at the jacket over a long drilling distance and the final step is done manually, presenting a degree of inefficiency and a risk of injury to workers due to the tube's considerable weight upon extraction. Through its VersaDrill Canada division, MBI Global has developed a tube extraction system for this final step

THE CHALLENGE

When starting up the tube puller, the rubber-coated rollers worked very well in the laboratory. In a real-world context, however, water-related slippage issues appeared to significantly reduce efficiency, along with premature wear caused by rock particles. MBI Global turned to TEKAD Industries and its Research in Diamond Drilling (RIDD) division for a solution. RIDD partnered with MBI Global (VersaDrill Canada), along with the Centre de métallurgie du Québec (CMQ) through a research partnership funded by the Natural Sciences and Engineering Research Council (NSERC), to help develop a solution that would help the rollers maintain their grip on the tubes under harsh mining conditions while resisting environmental wear and tear.

ADDBASE COATING DEVELOPMENT FOR NONSLIP ROLLERS



Tube puller



RIDD rollers

THE SOLUTION

The solution planned by TEKAD Industries was to improve gripping and wear resistance properties by developing a coating that contains diamonds deposited through a directed energy deposition technology or, more specifically, the Optomec LENS process. To maximize effectiveness, the CMQ developed the coating composition and production parameters. The result was TEKAD's Addbase coating.

BENEFITS/RESULTS

The DED process produced a gripping and wear-resistant coating that could not have been achieved otherwise, making it unique. The Addbase diamond coating made the roller pulling system fully effective without neglecting the health and safety issues associated with the tubes' final extraction. The coating's efficiency can also increase productivity during exploratory drilling. Previously, only a single core tube could be extracted at any given time due to the weight involved. The roller's efficiency helps the puller extract several core tubes in a single operation, thus reducing tube-extraction/drilling-time ratios and increasing the efficiency of core drilling. The entire success story, along with the tube puller's operation, can be seen in the following video, which first appeared at the 28th ADRIQ-RCTI Innovation Awards Gala; the partners involved won the Technology Partnership Award: [PARTENARIAT TECHNOLOGIQUE - VersaDrill Canada en partenariat avec le Centre de métallurgie du Québec on Vimeo](#) (available in French only).

CONTACT

TEKAD Industries – RIDD Division
2375 Jules Vachon Street, Trois-Rivières, QC, G9A 5E1
Louis-Marie Loembe, Eng, M.Sc, R&D Director
1 819 691-4244