

## A SUCCESS STORY

### 3D PRINTING OF COLD METAL PARTS

Cold spray metal additive manufacturing (CSAM) technology is helping develop new industrial applications to meet the demands of the surface transportation, aerospace, automotive and plastics industries. It provides a number of important technological advantages, including deposition rates that are 10 to 1000 times higher than competing technologies, along with its use of industrial robots that forego the need for a controlled atmosphere. Thus, it offers significant competitive advantages across many applications.

Many of the project's technological spin-offs have enhanced the competitive value of CSAM by creating a new powder modification method, parameter optimization software (CSAM Digital Solutions), lasers to focus heat treatment strictly on sprayed parts, along with developments in advanced quality control sensors.

The research partner was the **National Research Council of Canada** via **Eric Irissou's** team. The project's industrial partners anticipate spin-offs that include the commercialization of metal powders, equipment and services.

In March 2020, the SME **Polycontrols** established a world-class CSAM facility called PolyCSAM, which has already created six high-tech jobs and the prospect of four to six additional hires, along with an anticipated doubling of its revenue within two years.

The firm **5N Plus** was able to develop a copper powder that is now being marketed successfully. The SME **Equispheres** validated and refined its powders while developing business relationships with 14 companies and raising \$30M in financing in 2020 to scale up its process, with full production slated for 2021. The SME **Tecnar** improved a CSAM quality control sensor, which it expects to commercialize in 2021. **Hydro-Québec** has used the new knowledge and is currently considering the use of CSAM to repair turbine blades damaged by cavitation. **Bombardier Transportation** identified applications for CSAM in their production and went on to design a development roadmap. The results of the project have led to a key milestone in the development of nuclear waste containers at the **Nuclear Waste Management Organization**, a \$1 billion Canada-wide initiative; this application is now in its pre-production stage at the PolyCSAM facility using 5N Plus copper powder and Tecnar's quality control sensor. It will soon be used for the safe storage of nuclear waste generated at Hydro-Québec's Gently power plant.

 *The NRC and PRIMA partnership under the CSAM consortium played a critical role in the birth and establishment of PolyCSAM, a brand new world-class facility whose mission is to propel cold spray additive manufacturing (CSAM) to its full industrial scale.* 

- **Luc Pouliot**,  
Chief Operating and  
Technology Officer, Co-owner,  
Polycontrols Technologies Inc.



**SECTORS**

Advanced manufacturing  
Surface treatment  
Scaling



**APPLICATIONS**

Surface transportation  
Aerospace - Automotive  
Plastics



**TRL**

4



**DURATION**

36 months  
(2017-2020)



POLYCONTROLS



equispheres

tecnar



BOMBARDIER  
TRANSPORTATION

