

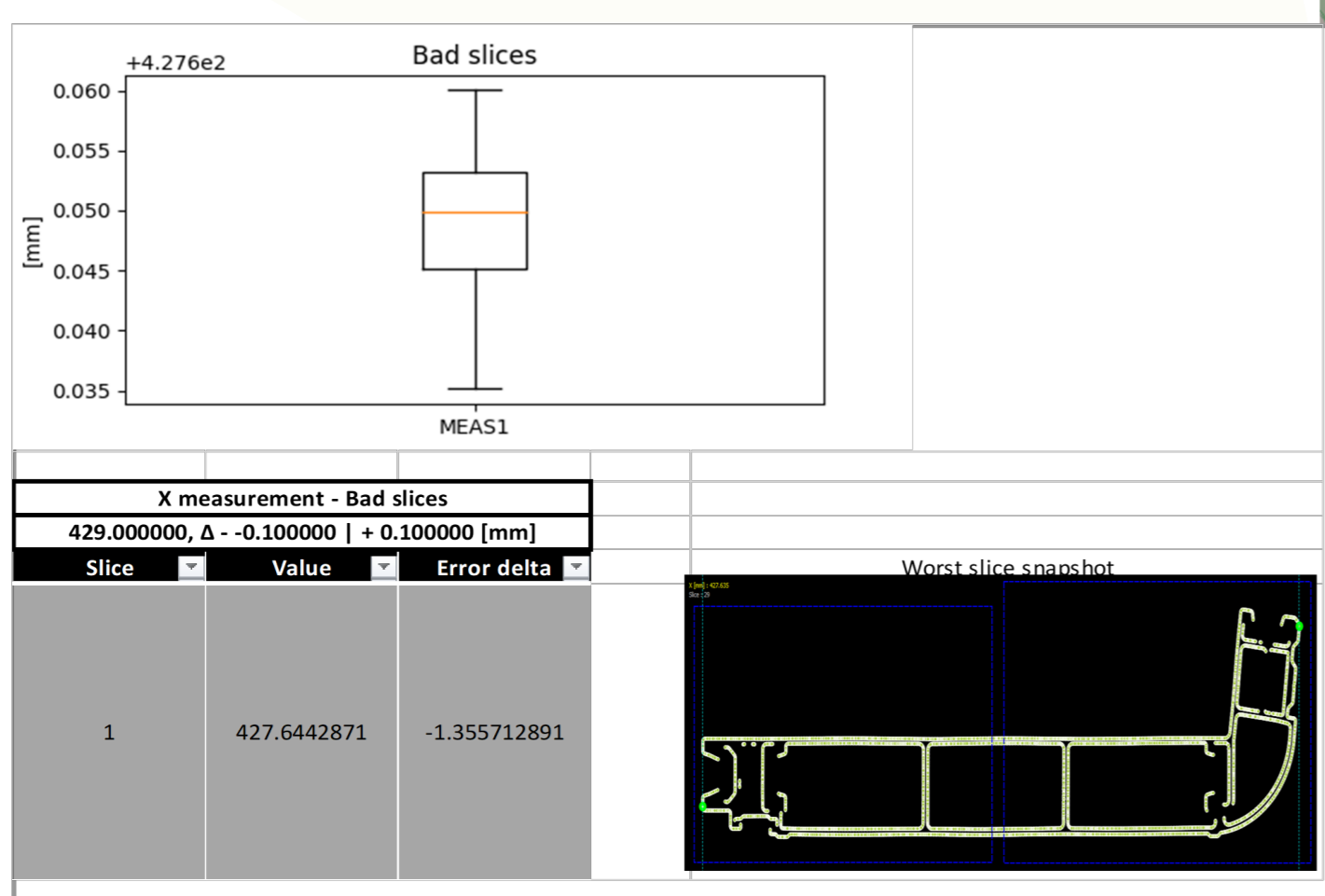
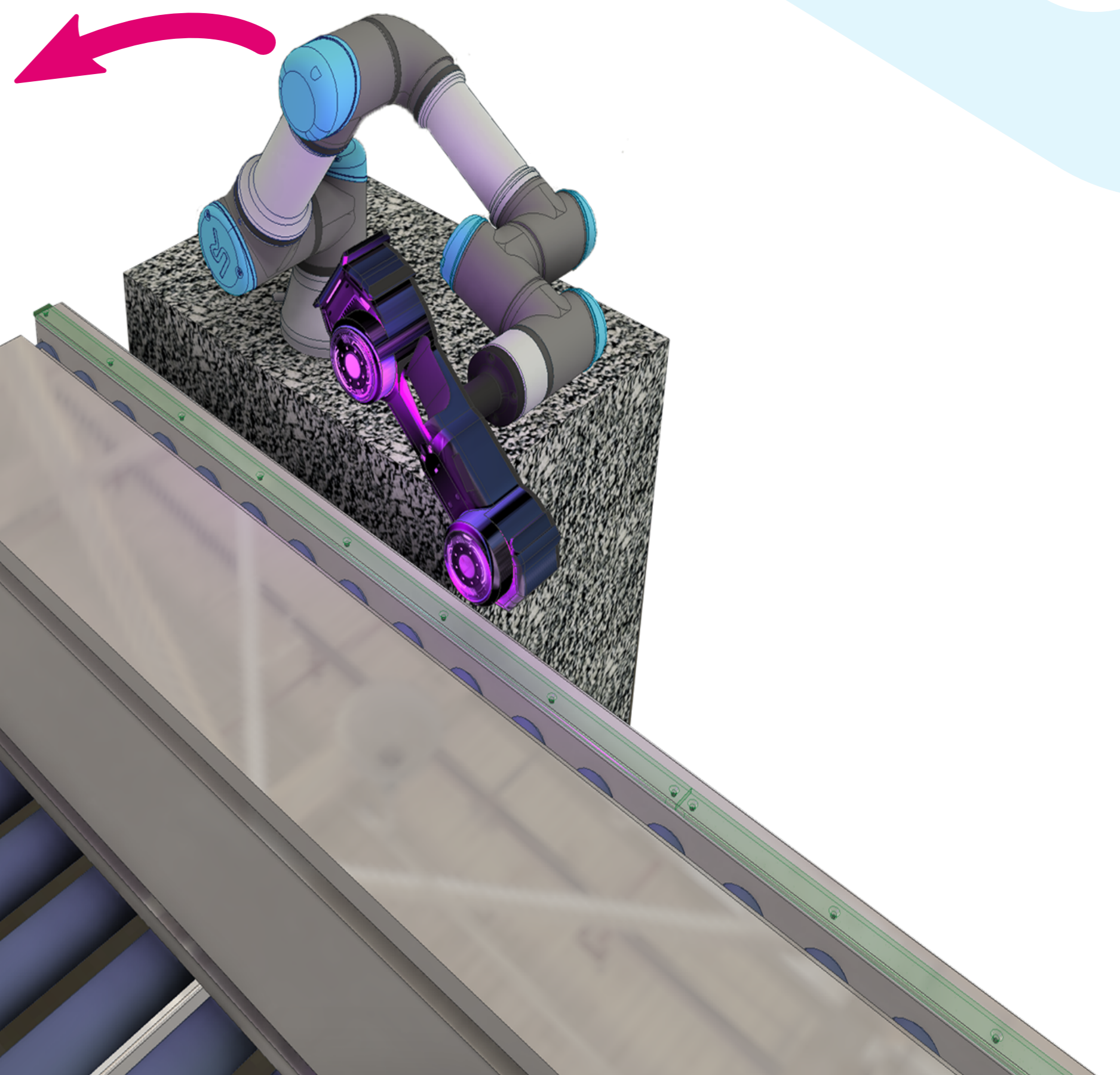
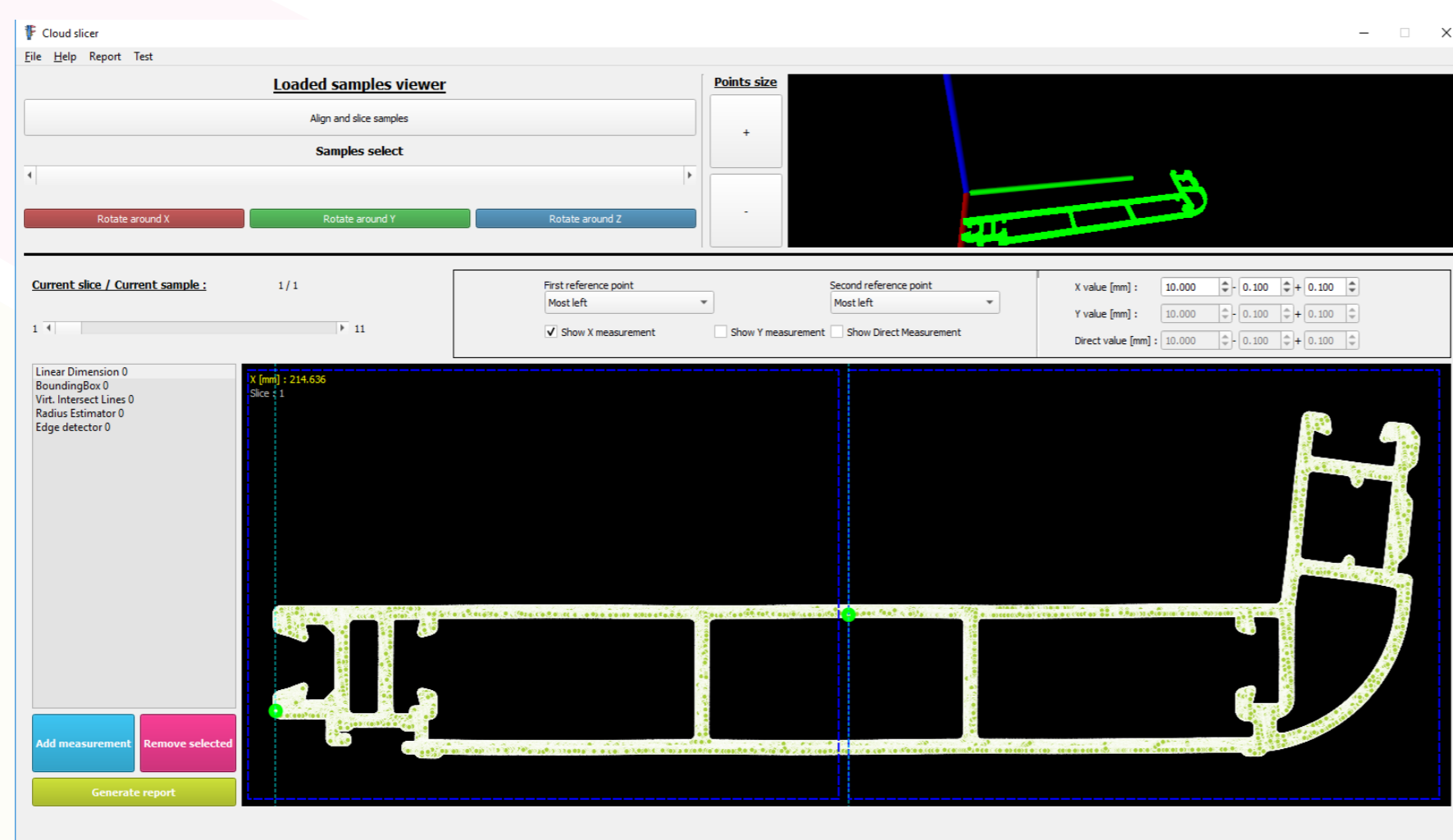
# Viable Large Scale in Production Metrology

**The goal :** the **Vi**able **L**arge **S**cale in **P**roduction **M**etrology (**VLSPM**) project is to develop a system that can perform metrological measurements on extruded profiles during production in order to save valuable time and money by detecting problems early in the production chain (e.g. in case some process steps take a long time).

**The idea :** the quality control process can be automated while collecting more data that can be used to learn and achieve better tolerances or predict tool wear. In addition, the part is digitally enhanced by allowing a true 3D representation to be sent to the customer, who can then better plan his own process.

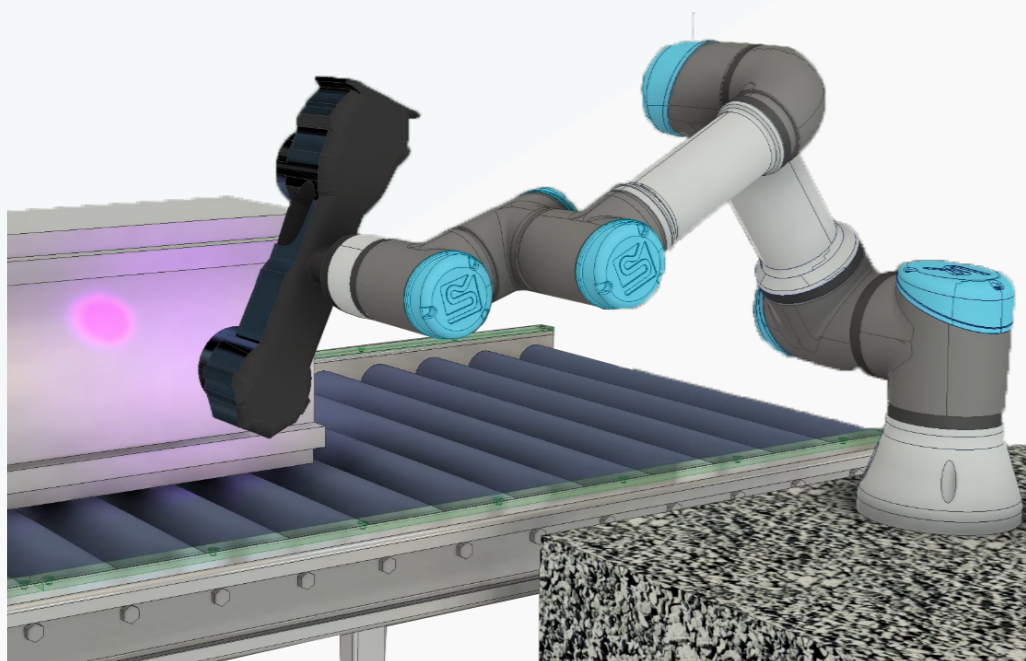
**The outcome :** existing measurement technologies are merged (3D scanner, robotic arm) with customized software (point cloud manipulation, scan cleanup, slicing and defect reporting) to accurately measure parts up to 30 [cm] thick, 75 [cm] wide and 30 [m] long.

A Proof of Concept (POC) was successfully implemented and tested for extruded Aluminium profiles at Constellium Valais SA.



## Retrieval

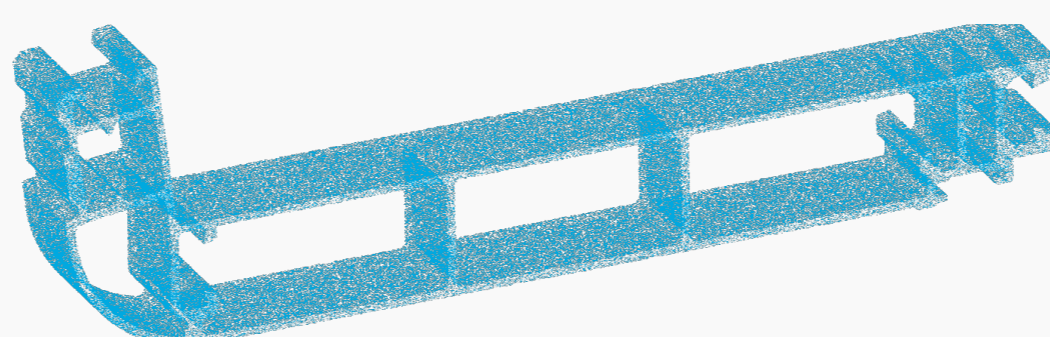
A dedicated system is built, consisting of a robot arm to get around the part and a non-contact 3D scanner to retrieve the geometry (since the part can be up to 400 [°C]).



## Processing

Once scanned, the various samples are reoriented and merged together, then cleaned from outliers (walls, floor, erratic points ...).

A region growing algorithm is then applied to ensure the part is a continuous solid.



## Analysis

The cloud is finally cut into 2D slices, where different measurements are set (distance, angles, roundings, bounding box). The operator can control them by hand, or choose to generate a pass/fail report.

