

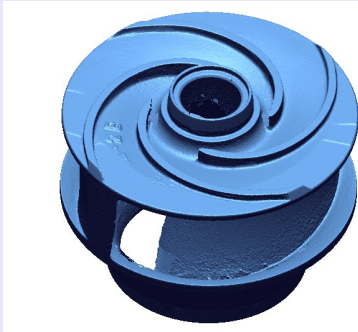
# Global Inspection Solutions

## Impossible Impellers

### Background

Impellers are a particularly tricky class of part that are extremely difficult to reverse engineer without the right tools. With unique profiles and helical curves, impellers rarely prismatic surfaces, and 3D scanning is the only way to capture all of the unique geometry. Many of our clients have been manufacturing legacy parts for years without drawings or 3D CAD models. When those clients need to build new tools or work with a new supplier, they are always asked to provide 3D cad models. When your parts are something as complicated as an impeller, 3D scanning is the only way to go.

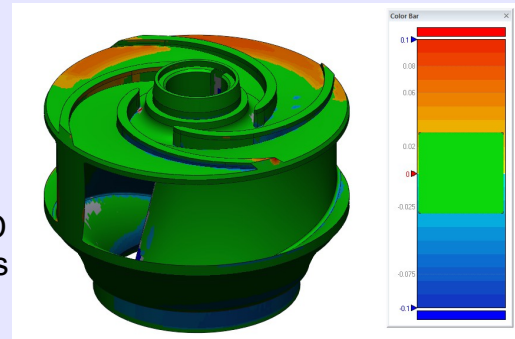
### Our process



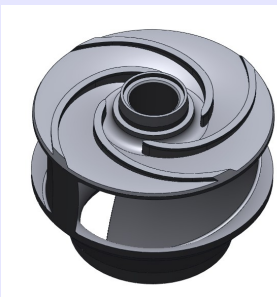
The original impeller was stainless steel with polished machine edges. Round parts make quick scans on our automated rotary scanner. With two setups we were able to capture all of the exterior surfaces of the impeller. The scanner captured all of the exterior surfaces as well as the internal impeller blades.

With a detailed 3D scan, we were then able to fit new CAD surfaces to perfectly match the original geometry. Cross

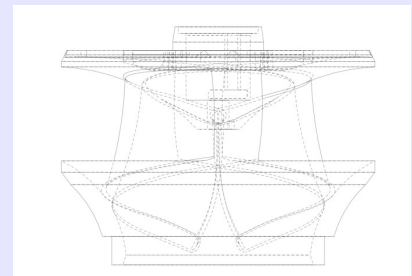
section curves could be made at any point, and the resulting 3D cad geometry was then tested against the 3D scan. Areas colored green meet our allowable error. Areas colored blue and red show regions that were out of specification.



### The results



Interestingly, the out of tolerance areas that appeared during the reverse engineering processes were a defect in the original part. Many legacy parts that come to use have minor defects and errors that can often be corrected as part of the reverse engineering process. Since the customer was looking to reproduce a new part on modern tooling, we adjusted everything to ensure that the new parts were exactly on axis and



a drop in replacement for the original parts.