

# Global Inspection Solutions

## A New Spin on 3D Scanning

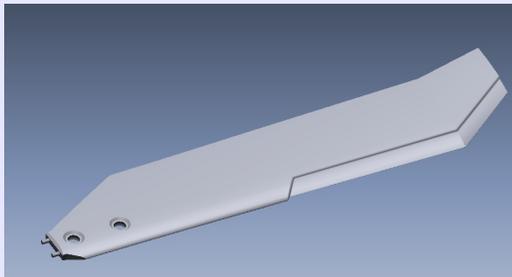
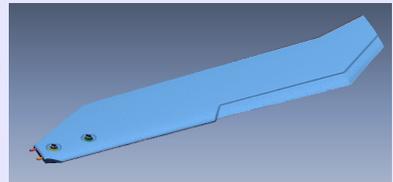
### Background



Our client has been fabricating composite blades for helicopters tail rotors for decades, using very unique tooling that was constructed in the early days of CNC. That means that the original digital data that was used to cut the unique shape of the molds was lost long ago, so building new molds to support their growing demand means they first need to create new 3D models of their existing rotors.

### Our Process

We were provided a partially fabricated composite tail rotor, with a flat primer finish. We used our HDI Advance R2 structured light scanner to digitally capture the rotor from all sides, top and bottom, as well as capture all of the stainless steel mounting features.



With a high quality digital scan, we could then start reconstructing the rotor using our 3D cad tools. Clean cross section curves were reconstructed along the length of the airfoil, and used to define a constant profile airfoil. The blade was originally designed to use a constant profile, which twisted slightly along the length of the blade. We reproduced this using a common cross section, which was fit back to the original scan. This

approach ensured that we were constructing a clean, high quality digital 3D form with the design intent, rather than an exact duplicate of a real blade. This minimizes the chance of reproducing minor deviations, such as warp and sag that may resulting from the manufacturing process.

### The Results

With a high quality digital model complete, it was easy to start designing new molds and templates for fabrication. A set of high quality profile gauges was constructed right from the new 3D model, which were then used to laser cut airfoil profile gauges. These gauges could then be used to validate newly constructed parts, and ensure the blades still meet the design intent. And new molds? With a new 3D digital design, its just a mouse click away to produce new molds on a CNC machine.

