

KOTEM

SmartProfile[®] Increases Yield for Major Orthopedic Implant OEM



The Solution

- Proper Analysis of CMM data with SmartProfile®
- Conclusion: CMM Was Rejecting Good Parts!

The Product



- Orthopedic Implant Assembly for Knee Replacement

The Component



- Femoral- The high strength alloy component that is implanted on the end of the femur.

The Process

- High strength alloy casting is machined, ground and polished to precise tolerances



The Process

- Parts are polished for appearance and proper geometry, using hand and/or mechanical systems

The Process

- Casting, in-process, and finished parts are measured with CMM to assure conformance to design specifications



The Problem

- Parts are rejected by the CMM despite appearing to be in tolerance when measured using conventional methods



The Impact

- Non-compliant parts are scrapped at a significant cost
- Excessive time is spent recalibrating the CMM, and investigating manufacturing processes to discover the reason for non-compliant parts

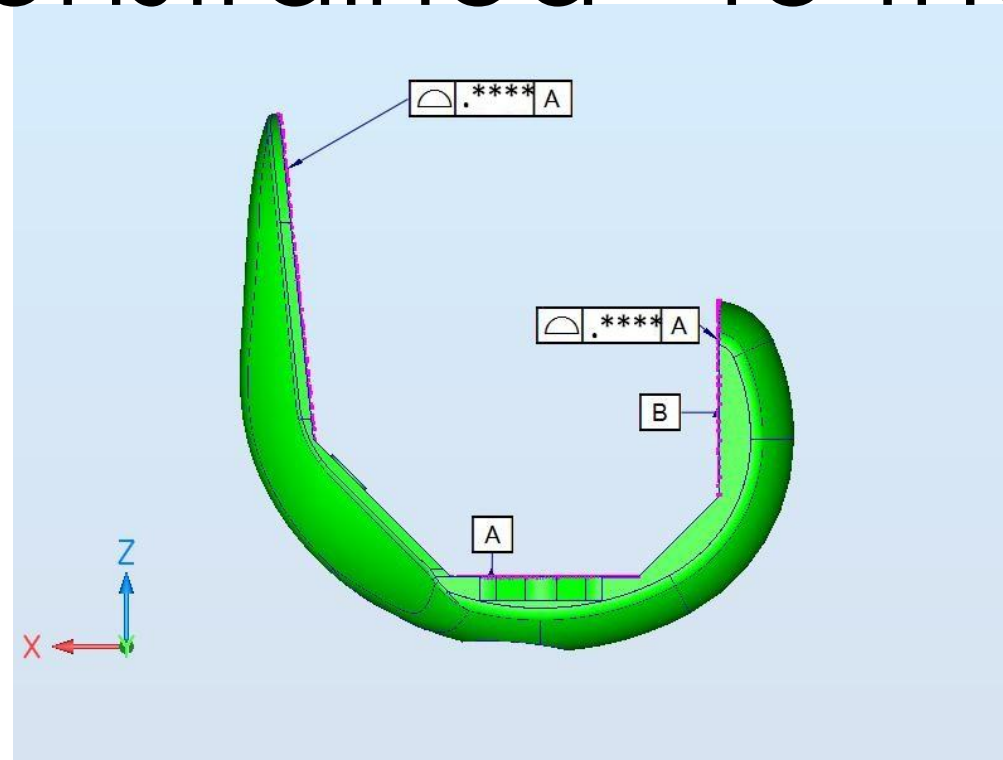


The Root Cause

- The CMM software cannot properly analyze the measured data per the design standard, Y14.5M, also known as “Geometric Dimensioning & Tolerancing” (GD&T)

Root Cause – Detail

- The femoral component design utilizes Profile Tolerance to achieve design intent
- In this case the Profile Tolerance was partially constrained - to the -A- Datum only



Root Cause – Detail

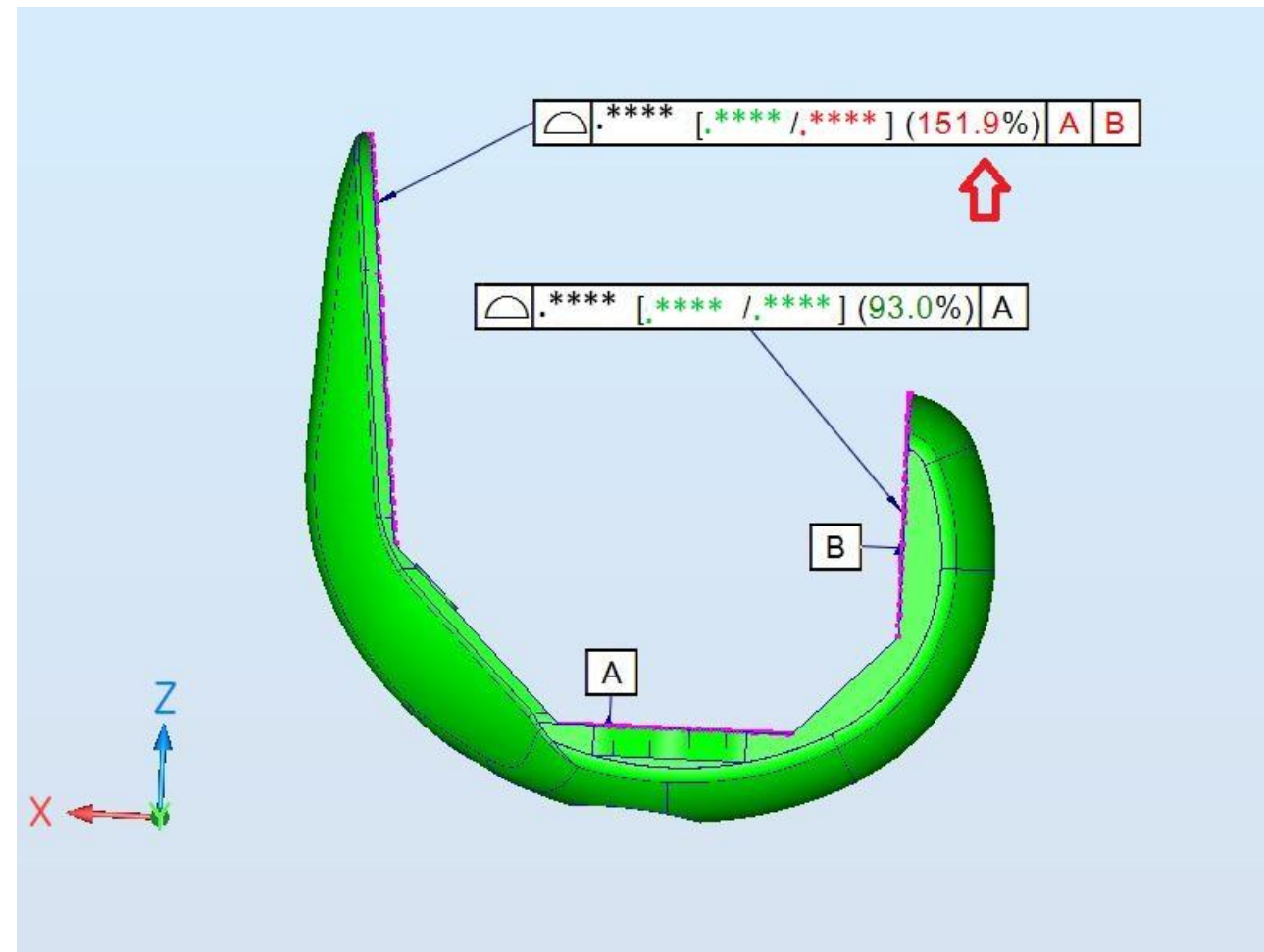
- CMM software was unable to analyze the two separate surfaces as a simultaneous Profile, *constrained to the -A- Datum only*

Root Cause – Detail

- Instead, the CMM software treated the data points as if fully constrained.

Root Cause – Detail

- “Tightening” the tolerance caused the CMM to “**REJECT GOOD PARTS**”

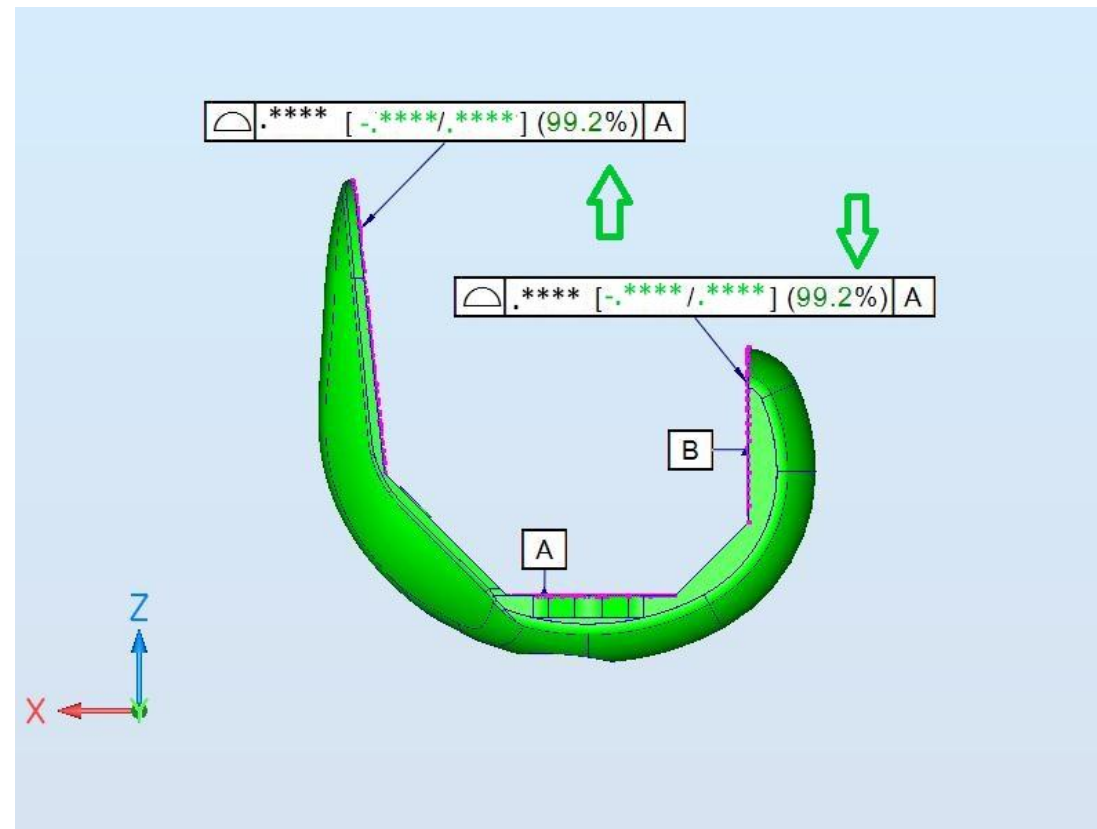


The Solution

- SmartProfile[®] GD&T Fitting software was used to analyze the data points measured by the CMM
- SmartProfile[®] correctly analyzes the measured data per Y14.5M

The Solution

- With the measured data points constrained to the -A- Datum only, the **rejected parts** are found to be in conformance



The Impact

- The application of SmartProfile® to the CMM measurement process resulted in an **increase in yield of over 20%**

The Impact

- SmartProfile® – Improved results by properly analyzing CMM data per ASME Y14.5M