Optical Gaging Products
A Division of Quality Vision International

Case Study
Orthopedic Implants

Focus: Stem Tibia Implants

Challenge: Orthopedic implants present a unique manufacturing challenge. Many implants are produced on a semi-custom or even a custom basis to suit the individual patient. The stem tibia implant consists of a number of contours, surfaces and shapes which mirror the shapes in the human tibia. These features are not easily defined as standard lengths, widths and diameters. Rather, they are made up of complex curves and surfaces which require a variety of sensors and sophisticated software to analyze correctly.

Stem Tibia Implants.

The Multisensor Advantage: The OGP SmartScope® Flash™ CNC 300 combines the measurement range, sensors and accuracy needed to measure stem tibia implants. Critical dimensions on the stem tibia include a combination of standard feature geometries, complex surfaces and profiles. Optical, laser and tactile sensors are needed to fully measure all features. For example, optics are used to measure thru-hole diameters, while curved surfaces are measured with the integral TTL laser. The sidewall of the raised edges requires a touch probe, as it is not possible for the optics to image this area.

OGP MeasureMind® 3D software allows all three of these sensors to be applied in a single routine. Since the outside profile has a sharply-defined edge, optics were the best choice to characterize the profile of the part. With this profile established, a touch probe was used to acquire all surface geometries in 3D space. The TTL Laser was used to collect high density measurements on the part's surface. Measured data was imported into SmartProfile® for complete GD&T analysis.

The Result: The SmartScope Flash CNC 300 with MeasureMind 3D software successfully reduced the measurement time of the stem tibia implant by over 50%. In addition to fast measurement, data was analyzed using SmartProfile software from Kotem, a Division of Quality Vision International. GD&T standards were then applied to comply with ASME Y14.5-2009.