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**TALYROND 585 METROLOGY TOOL PLAYS  
KEY ROLE IN RETRIEVED HIP IMPLANT ANALYSIS**  
**Roundness, Roughness and 3-D Characterization Prove Essential**  
**In Understanding Corrosion and Wear Effects on Retrieved Hip Implants**

PHILADELPHIA, PA— To understand how hip implants perform in vivo, Exponent, an engineering and consulting firm, and the Implant Research Center at Drexel University in Philadelphia are utilizing the unique capabilities of the Talyrond 585 metrology instrument from AMETEK Taylor Hobson to conduct advanced surface and material loss analysis from taper junctions in explanted hip joints.

Researchers have speculated that material loss from taper junctions may be a factor in the elevated revision rates that have been reported for some types of hip implants with a modular junction between the femoral neck and stem. The study conducted by Exponent's Biomedical Engineering Practice and the Implant Research Center involves the detailed analysis of metal head-stem pairs from retrieved hip implants.

The implant components are carefully measured for material loss from fretting and corrosion using the Talyrond 585. Among the study's goals is the development of precise analytical methods for determining how implant design, manufacture, surgical technique, patient history and other factors may affect the material loss from the taper junctions in orthopedic devices.

Typically used for inspection of precision-manufactured components, the Talyrond 585 was chosen for the hip implant study for its unique ability to measure roundness, contour and surface finish on a single platform. In developing the Talyrond 585, Taylor Hobson combined its industry-leading experience in high-accuracy surface measurement with its extensive expertise in ultra precision machining.

The resulting Talyrond 585 is a breakthrough metrology tool with an impressive measurement resolution of 0.3 nm and number of other key advantages for measuring complex micro-features. The Talyrond 585 offers a high-resolution gauge for linear or circumferential surface roughness measurement; frictionless air-bearing spindle, and precision column for roundness, cylindricity and straightness measurements. It also incorporates a patented calibration technique for the measurement of radius, angle, height, length and distance.

Equipped with both a 5 µm diamond and a 4 mm ruby-ball stylus, the Talyrond 585 was able to make simultaneous form and topography measurements for the hip implant study, to identify areas of corrosion and wear, and to provide precise dimensions for calculating the volume of material loss.

Another key advantage is Taylor Hobson's proprietary TalyMap software, which not only allowed investigators to identify areas of wear and accurately calculate wear volumes but also to stitch together multiple axial profiles (up to 720) into full color, photo realistic 3-D images.

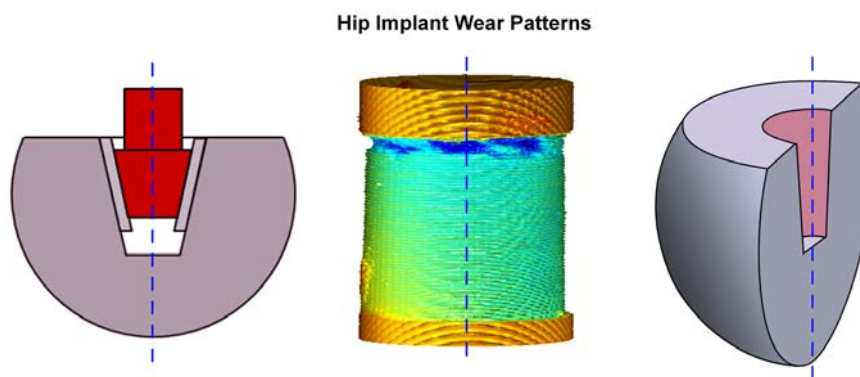
The data generated by Talyrond 585 and the detailed graphical 3D surface maps that data produced have greatly expanded the team's understanding of the patterns of material loss that have occurred with the metal hip implants and offered significant insight into the mechanisms that may have caused it. Among the team's next steps is to develop the techniques utilized into standards that can be applied elsewhere in studying retrieved implants.

Taylor Hobson is a pioneer in ultra-precision measurement instruments and the developer of Coherence Correlation Interferometry. The patented technique provides a wide measurement range, high-resolution images, short time of measurement and an exceptional ability to measure surfaces of different materials and textures.

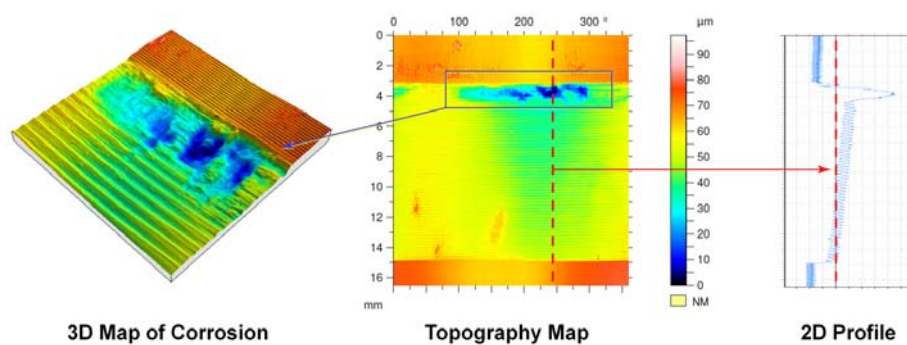
Taylor Hobson is a unit of AMETEK, Inc, a leading global manufacturer of electronic instruments and electromechanical devices with annual sales of \$3.6 billion. For more information, contact Taylor Hobson, 1725 Western Drive, West Chicago, IL 60185, USA. Tel: 630-621-3099. Fax: 630-231-1739. E-mail: [sales@taylorhobson.us](mailto:sales@taylorhobson.us) Web site: [www.taylor-hobson.com](http://www.taylor-hobson.com)



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[Click here for a hi-res illustration of Hip Implant Wear Patterns](#)



[Click here for hi-res illustrations of Corrosion Profiles and Wear Map](#)