

Applications Report: Roughness Inspection of Hydraulics Sealing Seat

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Executive Summary

The performance and longevity of hydraulic systems depend heavily on the precision and surface quality of sealing interfaces. EDM Intelligent Solutions offers high-resolution, non-contact 3D metrology services tailored to evaluate complex sealing geometries. This report presents a case study on surface roughness analysis of a stainless-steel hydraulics sealing seat using our MVi5 3D Metrology Center.

Overview of 3D Metrology Capabilities

Using advanced 3D scanning systems, EDM Intelligent Solutions provides quantitative analysis of surface textures and geometric conformity. Our non-contact measurement technology is especially valuable for sensitive or high-precision components where traditional tactile methods may introduce damage.

Key capabilities include:

- High-resolution 3D scanning at μm scale
- Surface roughness parameter extraction from 3D profiles
- Non-destructive inspection of critical hydraulic components
- Capability to inspect recessed and complex geometry features

Application Case Study: Hydraulics Sealing Seat

Component Overview

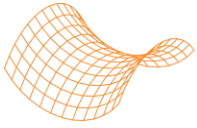
- Type: Hydraulics Sealing Seat
- Material: Stainless Steel
- Metrology System: MVi5 3D Metrology Center
- Metrology Services: Surface Roughness Measurement

Inspection Process

A complete 3D scan of the sealing seat was performed using the MVi5 3D Metrology Center. From this scan, 3D surface profiles were extracted at critical interface zones to assess surface roughness parameters, such as Ra and Rz. These parameters are used to evaluate the sealing effectiveness, wear characteristics, and fluid retention capability of the surface.

Results & Value Delivered

- Detailed characterization of surface texture on a sealing interface
- Verified roughness values within design tolerances



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- Non-contact method preserved the original surface quality
 - Accurate insight for quality control and process refinement
 - Reliable flatness and pitch analysis for performance assurance
 - Enhanced product reliability through rigorous dimensional control

Conclusion

Accurate measurement of surface finish is critical in high-pressure hydraulic applications. EDM Intelligent Solutions' 3D metrology services provide manufacturers with confidence in the sealing performance of their components, ensuring reliability, safety, and efficiency in demanding environments.

About EDM Intelligent Solutions

EDM Intelligent Solutions is a leader in high-precision metrology and advanced manufacturing services. We deliver customized solutions to meet the most rigorous demands of the aerospace, medical, energy, and fluid power industries.