



# MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

AMS-402

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**AMS-402 Advanced Mechanical Seals** Everything included in IMS-301 - Introduction to Mechanical Seals, but adds application considerations and theory appropriate for engineers and technical personnel working with any mechanical seals on rotating equipment. How they work, the theory (and calculations) behind them, installation, and how to troubleshoot problems. Selecting, specifying, and application considerations are a big part of this course. Mechanical seals are expensive and improper handling or mistakes made during selection or installation can increase the maintenance budget dramatically. Ability to troubleshoot seal failures and to make appropriate corrections will be a focus of this class. Classroom exercises, assembly/disassembly of various seals, and other hands-on activities will be used to reinforce the concepts. **Students are encouraged to bring in their worst seal problems from their site.**



<p><b>MECHANICAL SEALS</b></p> <ul style="list-style-type: none"> <li>• Fundamental Seal Operation - Why is a Seal Needed?</li> <li>• Seal Requirements</li> <li>• Leak Paths on a Mechanical Seal</li> <li>• Seal Face Lubrication</li> <li>• Face Deflections</li> <li>• Pressure-Velocity Limits</li> </ul> <p><b>BASIC SEAL DESIGNS</b></p> <ul style="list-style-type: none"> <li>• Simple Mechanical Seals</li> <li>• Single Unbalanced Seals</li> <li>• Single Balanced Seals</li> <li>• Pusher Seals</li> <li>• Non-pusher Seals</li> <li>• Mixer Seals</li> <li>• Gas Seals</li> <li>• High Pressure/High Speed/Specialty</li> <li>• Lapping, Polishing, Face Flatness</li> <li>• Special—Diamond, Hydropads, Wavy Face, Matt Lappe, etc</li> </ul> <p><b>SEAL ARRANGEMENTS</b></p> <ul style="list-style-type: none"> <li>• Inside/Outside Seals</li> <li>• Tandem/Double Seals</li> <li>• Cartridge/Component Seals</li> <li>• Installing a Component Seal</li> <li>• Split Seals</li> <li>• Multiple Lip Seal Cartridges</li> <li>• Assembly &amp; Disassembly of Seals</li> </ul> <p><b>SEAL APPLICATIONS</b></p> <ul style="list-style-type: none"> <li>• Materials of Construction</li> </ul>	<ul style="list-style-type: none"> <li>• Common Seal Applications</li> <li>• Stuffing Box Pressure</li> <li>• Seal Type</li> <li>• Emissions</li> <li>• Common Single Seals</li> <li>• Common Dual Seals</li> <li>• Water &amp; Hot Water</li> <li>• Sticky/Viscous/Polymers</li> <li>• Dissolved Solids</li> <li>• Entrained Solids/Slurries</li> <li>• Life Cycle Costs</li> <li>• Classroom Exercise - Seal Selection</li> </ul> <p><b>SEAL FLUSH PLANS</b></p> <ul style="list-style-type: none"> <li>• Porting, Tubing, Piping &amp; Valves</li> <li>• Single Seals</li> <li>• Dual Seals</li> </ul> <p><b>MATERIAL OF CONSTRUCTION</b></p> <ul style="list-style-type: none"> <li>• Face Materials</li> <li>• Secondary Seal Materials</li> <li>• Mechanical Seal Hardware</li> </ul> <p><b>ENVIRONMENTAL CONTROLS</b></p> <ul style="list-style-type: none"> <li>• Temperature Control</li> <li>• Control of Dirty, Incompatible or Hazardous Environments</li> </ul> <p><b>STATIONARY INSERT AND GLAND RING DESIGNS</b></p> <ul style="list-style-type: none"> <li>• Insert Mounting Designs</li> <li>• Piloting of Stationary Members</li> <li>• Gasketing of Stationary Members</li> <li>• Gland Features</li> </ul>	<p><b>INSTALLATION, OPERATION &amp; MAINTENANCE</b></p> <ul style="list-style-type: none"> <li>• Installation</li> <li>• Startup and Operation</li> <li>• Maintenance, Storage &amp; Spare Parts</li> </ul> <p><b>TROUBLESHOOTING SEAL PROBLEMS</b></p> <ul style="list-style-type: none"> <li>• Face Damage</li> <li>• Secondary Gasket Damage</li> <li>• Secondary Hardware Damage</li> <li>• Gland Damage</li> <li>• Sleeve Damage</li> <li>• Disaster/Bushing Damage</li> <li>• Common Seal failures - Examine Example Seal failures</li> </ul> <hr/> <p><b>CLASS FORMATS AVAILABLE</b>    MTI Hands-On Center /person</p> <p><b>CLASS DURATION</b>    1-day, 7.5 hours of instruction    20% Hands-On</p>
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**Class Details:** Each student will receive class books, work activity sheets, self-test progress evaluations, as well as questions from the instructor to make sure they understand the material presented. It is expected that an attendee will leave the class with the basic knowledge of the subject and possess new found skills to better equip them when they return to their job. A certificate suitable for framing will be issued to each attendee who successfully completes the course. Call, email or check the website for the next time this course is scheduled at the MTI training center session. Revised: 11/16/2021