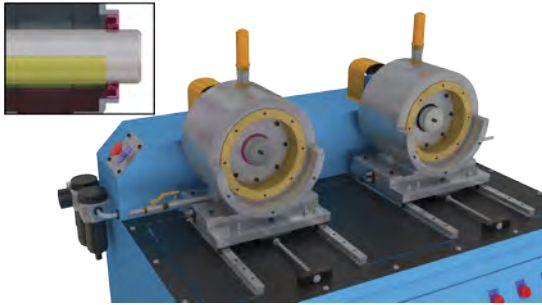


OIL SEAL FUNDAMENTALS: ROTARY APPLICATIONS

eLearning courses designed to increase productivity and profits



Learning made Simple, Visual, and Interactive

Oil seals are a crucial component in the operation of many devices and vehicles all over the world. Developed with the help of subject matter experts, this course will focus on the terminology, material processing, and manufacturing steps involved in the production of oil seals for rotary applications.

Credit Hours **3**

Learning Objectives

- 💡 Understand the basic components and configuration of rotary oil seals.
- 💡 Recognize the raw material involved in oil seal production.
- 💡 Recall some the primary steps required to mass produce oil seals.
- 💡 Understand the common testing processes applied to oil seal components.
- 💡 Differentiate between the defects that are common to oil seal manufacturing.

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I. Basic Concepts and Materials

- What are Rotary Oil Seals?
- Components of an Oil Seal
- Metal and Rubber O.D. Seals
 - o Metal O.D. Seals
 - o Rubber O.D. Seals
- Common Case Designs
 - o Rubber O.D.
 - o Metal O.D.
 - o Metal O.D. with Inner Case
 - o Half Metal/Half Rubber O.D.
- Common Polymer Materials
 - o Nitrile (NBR)
 - o Polyacrylic (ACM)
 - o Hydrogenated Nitrile (HNBR)
 - o Silicon (VMQ)
 - o Fluoroelastomer (FKM)
 - o Polytetra (PTFE)
- Common Lip Designs
 - o Single Lip with Spring
 - o Double Lip with Spring
 - o Single Lip without Spring
 - o Double Lip without Spring
 - o Triple Lip with Spring

- o Unitted with Spring
- o PTFE Seal

II. Oil Seal Production

- Metal Reinforcement
 - o Blank, Raise, & Pierce
 - o Degreasing
 - o Zinc Phosphating
 - o Dipping in Bonding Agent
- Rubber Blanks
 - o Rubber Mill
 - o Kneader
 - o Extruding Rubber Blanks
- Vacuum Compression Molding
- Lip Trimming
 - o Cone Trimming
 - o Collet Trimming
- Metal O.D. Operations
 - o Chamfering
 - o O.D. Grinding
 - o Oil Coating
- Garter Spring

III. Testing, Defects, & Installation

- Testing

- o Hardness Testing
- o Tensile Testing
- o Metal to Rubber Bond Testing
- o Compound Testing
- o Specific Gravity Checking
- o Profile Checking
- o Radial Load Testing
- o Lip Opening Pressure Testing
- o Performance Testing

• Defects

- o Flash
- o Poor Bond
- o Mold Impression
- o Blister
- o Porosity
- o Cut or Crack

• Installation

- o Pregreasing
- o Contamination
- o Handling
- o Shaft Protection
- o Fitment
 - Misalignment
 - Non-Uniform Force
 - Proper Installation Tool

