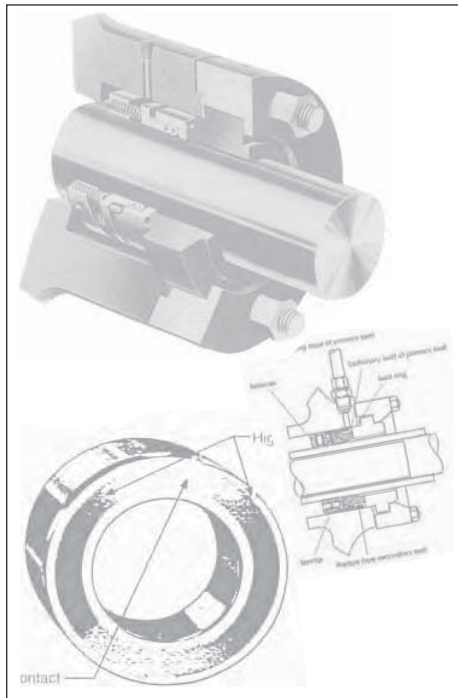

PRACTICAL MECHANICAL SEALS - SELECTION, MAINTENANCE AND TROUBLESHOOTING



YOU WILL LEARN HOW TO:

- Demonstrate a sound understanding of the fundamentals of seal selection
- Understand environmental considerations related to seals
- See how the experts repair and rebuild seals for outstanding performance
- Troubleshoot seals
- Maximise mechanical seal life
- Classify various seals, including special seal types
- Explain considerations related to the materials used in seal construction

The Workshop

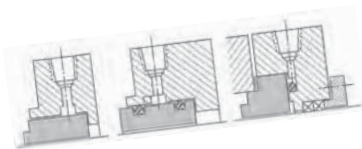
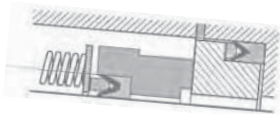
Whether you consider yourself as amateur or knowledgeable, practical or theoretical, you will find this two-day Mechanical Seals workshop is jam-packed with useful, easy to apply information. Faced with the bewildering task of selecting the correct seal type and materials of construction for a given application, it's no wonder many end users leave the job to others. After attending this course, you will have the knowledge and confidence to select correct seal types, analyse failed seals, determine the cause/s of failure and propose practical, remedial action.

Learn how, with simple modifications, you can extend seal life and reduce or eliminate causes of premature seal failure. The course commences with a solid review of the fundamentals, basic principles and looks at seal classification and design. Special seal types are examined and the materials used to construct seals ranging from elastomeric materials to cemented carbides are examined.

Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

To gain full value from this workshop, please bring your laptop/notebook computer.



The Program

FUNDAMENTALS AND PRINCIPLES

- Definition of zero leakage
- Mechanics of sealing
- Purpose of sealing
- Basics regarding speed and pressure
- Basic seal requirements
- Seal friction
- Wear and seal life
- Texture
- Seal balance criterion - balance ratio, pressure distribution
- Seal applications
- Operating capabilities, advantages and limitations

SEAL DESIGN AND CLASSIFICATION

- Identifying seal components and their function
- Primary sealing components - seal head, seal seat, springs for face loading, metal bellows
- Secondary sealing components
 - Elastomeric O-rings, V-rings, U-cup rings, wedge rings
- Inside and outside seals
- General arrangement modes
 - Single: cartridge, component, split, stationary
 - Duplex: tandem, back-to-back
- Static and dynamic seals
- Rotating and stationary seal heads
- Sealing face conditions
- Seal pre-loading

SPECIAL SEAL TYPES

- Bellows
- Bushing, labyrinth, diaphragm
- Gas, motion, slurry
- Carbon seals
- Liquid ring and liquid barrier seals
- Inflatable, ferrofluidic
- Positive action type
- Self-adhesive compression seals

MATERIALS OF SEAL CONSTRUCTION

- General considerations
- Properties of elastomers
- Elastomeric materials
- Plastic polymers
- Cemented carbides
- Miscellaneous sealing materials
- Material compatibility

SEALS FOR SPECIFIC/SPECIAL APPLICATIONS

- Hydraulic
- Pneumatic
- High temperature
- Large diameter

ENVIRONMENTAL CONSIDERATIONS AND CONTROL

- Abrasives, heat, dry operation
- Flushing, recirculation, quenching
- Convection, cooling, jacketing
- Buffer and barrier fluid
- Dead end lubrication, grease packing, circulating face lubrication
- API 610 environmental control schemes

AUXILIARY EQUIPMENT

- Cyclone separators
- Pressurisation units
- Air-coolers and heat exchangers
- Rotameters and flow controllers
- Leakage detectors
- Filters and strainers

SEAL HANDLING AND INSTALLATION

- General considerations
- Seat squareness

SEAL FAILURES

- Factors influencing seal life
- Factors affecting seal performance
- Seal malfunction and probable causes
- Friction and wear
- Adhesion, abrasion
- Corrosion and surface fatigue

SEAL SELECTION AND STANDARDS

- Seal selection guides
- Standards-ISO, British, DIN, ASME

TROUBLESHOOTING FAILED SEALS

- At the pumping site
- At the equipment teardown
- Discoloration, chipping, cracking, rubbing, elastomer swelling, stickiness, hardness - what do these mean?

HOW TO MAXIMISE MECHANICAL SEAL LIFE

- Preparing the pump - mechanically, hydraulically
- Controlling temperature in the stuffing box
- Controlling pressure in the stuffing box
- Which seal to choose?
- Which face combination and elastomer?

SUMMARY, OPEN FORUM AND CLOSING

