

# **MECHANICAL SEAL** **INSTALLATION INSTRUCTIONS**

## **INSTALLING A MECHANICAL SEAL IN A** **CENTRIFUGAL PUMP**

**CAUTION:** *Never put hands on lapped seal faces or put lapped seal parts face down on the workbench. Keep the mechanical seal in its original container until ready for installation.*

### **PREPARE PUMP**

1. Clean and inspect pump parts.
2. Replace shaft or shaft sleeve and gland if worn in secondary sealing areas under o-rings, Teflon wedges or Teflon rings.
3. Check for good starting bevel and remove all burrs that would cut secondary seal o-rings or cause misalignment. Pay close attention to set screw marks.
4. Check shaft run out (to be within .001" TIR per inch of shaft dia.), shaft end play (not to exceed .005"), stuffing box face alignment (must be square to within .003" TIR and have a good sealing surface, 125 RMS min.) and condition of bearings. Replace if necessary.

### **INSTALLING SEAL**

- 1) Bolt stuffing box back plate to the pump frame.
- 2) Install shaft sleeve.
- 3) Screw on impeller to hold shaft sleeve in proper position securely on shaft.
- 4) Scribe a line on the shaft sleeve at the face of the stuffing box.
- 5) Remove stuffing box plate.
- 6) Determine the operating length of a mechanical seal:
  - a) Place gland on clean area of workbench with the stuffing box face up.
  - b) Install stationary seal face with secondary sealing member in the gland (make sure gasket is in place if using a clamp type stationary).
  - c) Place gland gasket in proper position.
  - d) Place rotary unit, lapped face down, against the lapped stationary seal face.
  - e) With rotary unit at free height (not compressed by holding clips), measure the distance from the gland gasket to the top of the seal.
- 7) Determine the amount of compression on the seal:
  - a) Mechanical seals with multiple springs that are less than 2" in diameter require 1/8" compression.
  - b) Mechanical seals with multiple springs that are larger than 2" in diameter require 3/16" compression.
  - c) Mechanical seals with single springs usually have fixed or predetermined compression. Usually 1/2 of the free length of the single spring.

# Mechanical Seal Installation Guide

**Jin-Ying Zhang**



## **Mechanical Seal Installation Guide:**

*Seals and Sealing Handbook* Robert K. Flitney, 2014-06-13 *Seals and Sealing Handbook* Sixth Edition provides comprehensive coverage of sealing technology bringing together information on all aspects of this area to enable you to make the right sealing choice This includes detailed coverage on the seals applicable to static rotary and reciprocating applications the best materials to use in your sealing systems and the legislature and regulations that may impact your sealing choices Updated in line with current trends this updated reference provides the theory necessary for you to select the most appropriate seals for the job and with its Failure Guide the factors to consider should anything go wrong Building on the practical stepped approach of its predecessor *Seals and Sealing Handbook* 6th Edition remains an essential reference for any engineer or designer who uses seals in their work A comprehensive reference covering a broad range of seal types for all situations to ensure that you are able to select the most appropriate seal for any given task Includes supporting case studies and a unique Failure Guide to help you troubleshoot if things go wrong New edition includes the most up to date information on sealing technology making it an essential reference for anyone who uses seals in their work

**Principles and Design of Mechanical Face Seals** Alan O. Lebeck, 1992-04-16 Examines the fundamentals and practice of both the design and operation of face seals ranging from washing machines to rocket engine turbopumps Topics include materials tribology heat transfer and solid mechanics A variety of simple and complex models are proposed and evaluated and specific problems such as heat checking blistering and instability are considered Offers 64 tables and 364 references plus useful recommendations regarding the future of seal design

*Mechanical Engineer's Reference Book* Edward H. Smith, 2013-09-24 *Mechanical Engineer's Reference Book* 12th Edition is a 19 chapter text that covers the basic principles of mechanical engineering The first chapters discuss the principles of mechanical engineering electrical and electronics microprocessors instrumentation and control The succeeding chapters deal with the applications of computers and computer integrated engineering systems the design standards and materials properties and selection Considerable chapters are devoted to other basic knowledge in mechanical engineering including solid mechanics tribology power units and transmission fuels and combustion and alternative energy sources The remaining chapters explore other engineering fields related to mechanical engineering including nuclear offshore and plant engineering These chapters also cover the topics of manufacturing methods engineering mathematics health and safety and units of measurements This book will be of great value to mechanical engineers

**Seal Solutions: A Comprehensive Guide to Design, Materials, and Applications** Pasquale De Marco, 2025-07-23 This comprehensive guide provides a wealth of knowledge for engineers designers and technicians working with sealing solutions It covers a wide range of seal types including elastomeric metallic mechanical rotary and reciprocating seals offering a thorough understanding of their advantages and applications In depth exploration of seal basics design principles and advanced concepts empowers readers to make informed decisions when selecting and implementing seals Specialized topics

such as finite element analysis computational fluid dynamics tribology and new materials for seals equip readers with cutting edge knowledge Numerous case studies and references to industry standards and regulations ensure that readers can apply their newfound knowledge to practical scenarios with confidence Whether you are an experienced professional seeking to refresh your knowledge or a novice engineer eager to gain a comprehensive understanding of seal design and engineering this book is the ultimate resource With its clear and concise explanations abundant illustrations and practical examples this book will help you master the art of seal design and ensure optimal performance and reliability in your sealing applications

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**Basic Mechanical Maintenance Procedures at Water and Wastewater Plants** Glenn M. Tillman,1991-08-23 This is the first volume in a series of practical operator oriented books written to help ensure the proper operation and maintenance of water and wastewater plants The guides concentrate on how to perform the actual work required to keep a plant running smoothly They are not detailed reference filled treatment studies Basic Mechanical Maintenance Procedures at Water and Wastewater Plants is written in a straightforward manner using everyday language It will show you how to keep systems running smoothly troubleshoot and solve problems reduce equipment failure practice safety and save money Each chapter is written in an easy to follow step by step format with extra pages and room for notes so you can customize the book to meet your specific needs The book includes information on the following Equipment lockout procedures Lubrication Bearings Shafts and couplings Mechanical power transmission Centrifugal pumps Reciprocating pumps Rotary pumps Valves Pipeline maintenance Maintenance schedules This book is a must have for all water and wastewater operations and maintenance personnel

*Power Plant Equipment Operation and Maintenance Guide* Philip Kiameh,2011-12-16 THE DEFINITIVE GUIDE TO SELECTING OPERATING AND MAINTAINING POWER PLANT EQUIPMENT Power Plant Equipment Operation and Maintenance Guide provides detailed coverage of different types of power plants such as modern co generation combined cycle and integrated gasification combined cycle IGCC plants The book describes the design selection operation maintenance and economics of all these power plants The best available power enhancement options are discussed including duct burners evaporative cooling inlet air chilling absorption chilling steam and water injection and peak firing This in depth resource addresses the sizing selection calculations operation diagnostic testing troubleshooting maintenance and refurbishment of all power plant equipment including steam turbines steam generators boilers condensers heat exchangers gas turbines compressors pumps advanced sealing mechanisms magnetic bearings and advanced generators Coverage includes Methods for enhancing the reliability and maintainability of all power plants Economic analysis of modern co generation and combined cycle plants Selection of the best emission reduction method for power plants Preventive and predictive maintenance required for power plants Gas turbine applications in power plants protective systems and tests

, Mechanical Design Engineering Handbook Peter Childs,2018-11-24 Mechanical Design Engineering Handbook Second Edition is a straight talking and forward thinking reference covering the design specification selection use and integration of the machine

elements that are fundamental to a wide range of engineering applications This updated edition includes new material on tolerancing alternative approaches to design and robotics as well as references to the latest ISO and US engineering regulations Sections cover bearings shafts gears seals belts and chains clutches and brakes springs fasteners pneumatics and hydraulics amongst other core mechanical elements This practical handbook is an ideal shelf reference for those working in mechanical design across a variety of industries In addition it is also a valuable learning resource for advanced students undertaking engineering design modules and projects as part of broader mechanical aerospace automotive and manufacturing programs Presents a clear concise text that explains key component technology with step by step procedures fully worked design scenarios component images and cross sectional line drawings Provides essential data equations and interactive ancillaries including calculation spreadsheets to inform decision making design evaluation and incorporation of components into overall designs Includes procedures and methods that are covered to national and international standards where appropriate New to this edition flow charts to help select technology Failure Mode Effects Analysis FMEA product service and system design models Functional Analysis Diagrams FADs Design for Excellence DFX Design for MADE and the process of remanufacture **Aviation Unit and Aviation Intermediate Maintenance** ,1991 Operator'S Guide to Centrifugal Pumps, Volume 2 Robert X. Perez,2014-12-26 Many readers have found Operator s Guide to Centrifugal Pumps Xlibris 2008 to be a valuable training resource for process operators Volume 2 provides additional training material in the form of student challenge exams and additional exposure to reliability topics Volume 2 has two goals The first goal is to continue to build on the general theme of pump reliability in process facilitates The second goal is to provide student challenge exams for those wanting to master the material in Operator s Guide to Centrifugal Pumps The first chapter covers how process operators can be better utilized to improve pump reliability The importance of operating training and commissioning will be covered in the next two chapters In the final chapter a methodology for addressing troublesome centrifugal pumps is presented A majority of the book is comprised of three 3 different student challenge exams are included in Volume 2 Answers to all the exam questions are provided along with where the answers can be found in the Operator s Guide There are a total of 150 challenge questions with their answers *Guide for Protection and Repair of Concrete Structures* FIB - International Federation for Structural Concrete,2022-03-01 The idea of preparing a technical document for the repairs and interventions upon concrete structures goes back to the former fib COM5 Structural Service Life Aspects being the goal of the then TG5 9 After a long period of reduced activity and taking into account the reorganization of fib commissions that meanwhile took place on June 2017 a different approach was proposed to push forward the task of TG8 1 formerly TG5 9 The new goal of TG 8 1 was to deliver a how to do guide gathering together protection repair and strengthening techniques for concrete structures Chapters are intended to provide both guidelines and case studies serving as support to the application of fib MC2020 pre normative specifications Each chapter was written by an editorial team

comprising desirably at least a researcher a designer and a contractor Templates have been prepared in order to harmonize the contents and the presentation of the different methods Following the writing process chapters were reviewed by experts and after amendments by the authors they underwent a second review process by COM8 and TG3 4 members as well as by different practitioners For each protection repair and strengthening method addressed in this guide readers have a description of when to adopt it which materials and systems are required which techniques are available and what kind of equipment is needed It then presents a summary of stakeholders roles and qualifications design guidelines referring to most relevant codes and references the intervention procedure quality control measures and monitoring and maintenance activities Due to the extent of the guide it was decided to publish it as bulletin 102 addressing protection and repair methods and bulletin 103 addressing strengthening methods We would like to thank the authors reviewers and members of COM8 and TG3 4 for their work in developing this fib Bulletin which we hope will be useful for professionals working in the field of existing concrete structures especially those concerned with life cycle management and conservation activities As noted above this Bulletin is also intended to act as a background and supporting document to the next edition of the fib Model Code for Concrete Structures which is currently under development under the auspices of TG10 1 with the working title of fib Model Code 2020

**API STD 617 Interview Questions and Answers: The Guide for Compressor and Pump Engineers** Chetan Singh, 2025-01-23 API Std 617 Interview Questions and Answers The Guide for Compressor and Pump Engineers is the ultimate resource for professionals in the oil gas and petrochemical industries This API Std 617 answers book is tailored to help engineers master the intricate principles of API Standard 617 the gold standard for centrifugal and axial compressors Whether you re preparing for a job interview seeking certification or aiming to advance your career this API book provides detailed coverage of API Std 617 expertly crafted API 617 questions and answers and practical knowledge for compressor and pump engineers This API 617 standard guide bridges the gap between theoretical concepts and practical applications It empowers engineers with the knowledge and confidence to excel in interviews deliver exceptional performance in their roles and contribute to the reliability and efficiency of critical machinery Whether you re an experienced engineer or just starting your career in compressors and pumps API standard 617 Questions and Answers is your trusted companion to succeed in a competitive field Master API 617 and take the next step in your professional journey today

**Operator's, Organizational, Direct Support and General Support Maintenance Manual (including Repair Parts and Special Tools Lists)** ,1985 **Maintenance Engineering** Raghuvir L Chary, 2022-10-31 This book is meant for students of mechanical engineering and the maintenance workforce in industries It gives the fundamental and practical knowledge of the most commonly encountered maintenance engineering problems Readers are advised to gain more and more knowledge by continuously reading available material bearing in mind the saying that half knowledge is more dangerous than no knowledge more so in maintenance engineering There are five units in this book Unit 1 has the outline of

the whole maintenance subject Unit 2 deals with the economics of inventory of spares and the preparation of estimates Unit 3 emphasizes Predictive maintenance and Vibrations Unit 4 discusses an important topic of maintenance i e lubrication Unit 5 deals with some of the common machinery repairs and the intricacies involved including the most common air compressor and centrifugal pump repairs The book is prepared mainly from the exam point of view for students and as a general reference book Industries and workshops may also find this book useful in day to day maintenance work of all machines

**Lees' Loss Prevention in the Process Industries** Frank Lees,2005-01-25 Over the last three decades the process industries have grown very rapidly with corresponding increases in the quantities of hazardous materials in process storage or transport Plants have become larger and are often situated in or close to densely populated areas Increased hazard of loss of life or property is continually highlighted with incidents such as Flixborough Bhopal Chernobyl Three Mile Island the Phillips 66 incident and Piper Alpha to name but a few The field of Loss Prevention is and continues to be of supreme importance to countless companies municipalities and governments around the world because of the trend for processing plants to become larger and often be situated in or close to densely populated areas thus increasing the hazard of loss of life or property This book is a detailed guidebook to defending against these and many other hazards It could without exaggeration be referred to as the bible for the process industries This is THE standard reference work for chemical and process engineering safety professionals For years it has been the most complete collection of information on the theory practice design elements equipment regulations and laws covering the field of process safety An entire library of alternative books and cross referencing systems would be needed to replace or improve upon it but everything of importance to safety professionals engineers and managers can be found in this all encompassing reference instead Frank Lees world renowned work has been fully revised and expanded by a team of leading chemical and process engineers working under the guidance of one of the world s chief experts in this field Sam Mannan is professor of chemical engineering at Texas A principles practice codes standards data and references needed by those practicing in the field

**Forsthoffer's Proven Guidelines for Rotating Machinery Excellence** William E. Forsthoffer,2021-12-03 Forsthoffer s Proven Guidelines for Rotating Machinery Excellence draws on Forsthoffer s 60 years of industry experience to get new operatives up to speed fast Each of the topics covered are selected based on hard won knowledge of where problems with rotating machinery originate This easy to use highly illustrated book is designed to elevate the competence of entry level personnel to enable them to immediately contribute to providing optimum rotating machinery reliability for their companies The first 3 chapters address practical personal rotating machinery awareness detail how to optimize this awareness to identify low hanging fruit safety and reliability improvement opportunities and how to define and implement a cost effective action plan The remaining chapters focus on the function of key components in each type of rotating machinery and how to monitor and correct their condition before failure The last chapter is an RCA Root Cause Analysis procedure chapter detailing effective Root Cause Identification



before a Failure to prevent a costly failure and the need for a RCFA Real life examples are provided from the field of operation and maintenance of rotating machinery helping readers to implement effectively Includes important advice on monitoring approaches for different types of machines highlighting differences between working with pumps and compressors A chapter on Root Cause Identification features proven methods to help your organization to prevent machinery failures     **South African Automotive Light Vehicle Level 1** CDX Automotive,2012-12-28

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