Bolting Specialist Qualification Program

The Bolting Specialist Qualification Program consists of 3 major pieces: the On demand courses, Online Final Exam, and the Hands-On Training and Skills Assessment

Part I: Bolting Foundational Knowledge On Demand Courses

Course 1 – Principles of the Bolted Joint and ASME PCC-1 (3 HOURS)
Chapter 1: The Importance of Bolting
Chapter 2: General Bolting Principles
Chapter 3: ASME PCC-1

Learning Outcomes:

- Explain the importance of bolting
- Identify the types of industrial bolted joints
- Describe common bolting principles
- Explain the advantages of using bolted joints
- Discuss the concepts that underlie a functioning bolted joint
- Describe the contents of ASME PCC-1
- Recognize the importance of following PCC-1 guidelines

Course 2 – Flanges, Fasteners, & Gaskets (3 HOURS)
Chapter 1: Flanges
Chapter 2: Fasteners
Chapter 3: Gaskets

Learning Outcomes:

- Describe functions of the three component groups that make up a pressurized bolted joint
- Explain how components work together as a system to provide a leak free joint seal
- Learn the proper methods to inspect each of the key component groups for correct grade and material conditions
- Learn how to inspect for damage, and the relevancy of PCC-1 appendix in determining thresholds and tolerances

Course 3 – Putting It Together/Taking It Apart (3 HOURS)
Chapter 1: Tightening with Torque
Chapter 2: Tensioning
Chapter 3: Bolting Patterns
Chapter 4: Bolt Loosening
Chapter 5: Corrosion and Galling

Learning Outcomes:

- Recognize torque as it applies to pressurized joints
- Describe methods to correctly tension and torque bolts
- Learn the best practices of manual torque, hydraulic torque, or pneumatic torque equipment for tightening
- Learn the best practices of hydraulic tensioning and mechanical tensioning
- Idenitfy the most common mistakes and safety concerns when working

with powered equipment
- Be able to describe the Legacy patterning method, along with other acceptable substitute patterns
- Identify methods to prevent corrosion and galling

Course 4 – Bolting Safety and Tool Handling (3 HOURS)

Chapter 1: Bolting Safety and Tool Handling
Chapter 2: Manual Bolting Tools
Chapter 3: Pneumatic Bolting Tools
Chapter 4: Hydraulic Wrenches
Chapter 5: Hydraulic Pumps
Chapter 6: Hydraulic Torque Wrenches Chapter 7: Tensioners

Learning Outcomes:
- Explain why bolting safety is important
- Describe the need for planning and preparation in bolting practices
- Describe the safe use and handling of bolting tools, including:
  - Manual Torque Tools
  - Pneumatic Tools
  - Hydraulic Wrenches & Pumps, and
  - Hydraulic & Mechanical Tensioners

Part II: BOLTING SPECIALIST APPLICATION AND FINAL EXAMINATION:

Upon completion of the 4 self-paced eLearning courses, learners will need to submit an application to enroll in the Final Exam. In the application, a professional reference is required to complete a form which verifies applicant's completion of at least 6 months of work experience in bolted joint assembly. Once the application is approved, the candidate will be enrolled in the online Final Exam which consists 75 multiple choice questions. A passing grade of at least 90% is required to qualify for the hands-on training and skills assessment. Candidates are allowed multiple attempts to pass the Exam. There is no limit on the number of times to re-take the Exam.

Part III -HANDS-ON TRAINING AND SKILLS ASSESSMENT:

This part of the program requires a separate registration with an ASME Authorized Training Provider. Upon completion of this one-day hands-on and competency assessment, learners will have demonstrated their ability to effectively apply the principles of bolted joint assembly as defined in the practical examination requirements of ASME PCC-1, Appendix A to the satisfaction of the ASME-Authorized Training Instructor (ATI).

Working both individually and in small groups, learners will:
- Observe and practice proper procedures as modeled by the instructor
- Perform the key competencies required in each exercise within expected tolerances
- Be able to explain the technical principles underlying the practical competencies

Agenda:
I. Administrative Check-in (15 min)
II. Safety/PPE Discussion (30 Min.)
III. Torque/Load Measurement (30 Min.)
IV. Gasket Identification/Analysis (30 Min.)
V. Manual Torquing Demonstration (90 Min.)

VI. Hydraulic Torque Tool Review (30 Min)
VII. Hydraulic Torquing Demonstration (90 Min.)
VIII. Pneumatic Torque Tool Operation (30 min)
IX. Tensioner Operation (60 min)
    - Hydraulic (30 min)
    - Mechanical (30 min)
X. Q&A, Evaluations, Feedback (30 min)