



National Craft Assessment and Certification Program S P E C I F I C A T I O N S

INDUSTRIAL BOILERMAKER - MAINTENANCE V4

RBLMK34_04

October 2014

Focus Statement

A journey level industrial boilermaker in maintenance is skilled in general tower and exchanger maintenance including welding, pipe fabrication, and stress relieving. A boilermaker is also knowledgeable in oxyfuel cutting, identifying and installing valves, pipe hangers and supports, rigging, and able to read boiler drawings and detail sheets.

Overview

- Two-hour closed-book examination
- May use a basic function, non-printing calculator
- No extra papers, books, notes or study materials are allowed
- The minimum passing score is 75
- A Performance Verification is available

Study Materials

All NCCER written assessments are referenced to NCCER's curriculum listed in the content. You may order modules from Pearson (1.800.922.0579) or from NCCER's Online Catalog at www.nccer.org.

Assessment Development

All questions are developed and approved by subject matter experts under the direction of NCCER and Prov™, NCCER's testing partner.

Credentials

NCCER will send appropriate credentials to the assessment center for successful completions.

Training Prescription Reports

Each candidate will have access to individual results of the written assessment from Prov's website at www.provexam.com.

Registry

Assessment results will be maintained in NCCER's Registry and become a portable record of the candidate's training and assessment achievements.

NOTE: To receive a credential in Industrial Boilermaker – Exchangers candidates MUST complete and pass BOTH the Industrial Boilermaker – Maintenance assessment AND the Industrial Boilermaker – Exchangers assessment.

To receive a credential in Industrial Boilermaker – Towers candidates MUST complete and pass BOTH the Industrial Boilermaker – Maintenance assessment AND the Industrial Boilermaker – Towers assessment.

Written Assessment Contents:

Content Domain	Number of Questions
Safety (34102-10)	6
Welding Basics (34108-10) (34105-10)	6
Gaskets (34106-10)	5
Boilermaking Fundamentals (34103-10) (34202-11) (34205-11)(34401-12)	23
Construction Drawings (34204-11) (34402-12)	5
Rigging (15206-07)	13
Tubing and Piping (34203-11) (08205-06) (34308-11)	13
Towers and Exchangers (34307-12) (34411-12)	19
Total Number of Questions	90

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S P E C I F I C A T I O N S

Learning Objectives related to Assessment:

Safety	
Registry ID Number:	Module Title and Objectives:
34102-10	Boilermaking Safety
	List the specific hazards associated with the boilermaking field.
	Describe the respiratory hazards encountered by boilermakers.
	Identify the hazards associated with working at heights.
	Describe the equipment used to work at heights and identify the certification requirements needed to operate that equipment.
Welding Basics	
Registry ID Number:	Module Title and Objectives:
34108-10	Welding Basics
	Identify the different welding processes and welding equipment commonly used in boiler work.
	Identify the specialized personal protective equipment needed when performing welding and demonstrate the ability to use this equipment properly.
	Identify the specific safety hazards associated with welding and cutting in a boiler environment.
	Identify the types of welding joints, their critical dimensions, and their applications.
	Properly receive, store, and care for welding electrodes and filler metals.
	Identify the different code requirements that apply to the construction and maintenance of boilers.
	Explain the different qualification and certification requirements that apply to welders working on a boiler.
	Identify welding rods and/or filler metals by their markings.
34105-10	Oxyfuel Cutting
	State safety precautions associated with oxyfuel cutting.
	Identify and explain oxyfuel equipment components.
	Explain and demonstrate how to set up, light, and adjust oxyfuel equipment.
	Explain and demonstrate how to shut down, disassemble, and change out oxyfuel equipment.
	Describe and demonstrate the steps needed to perform specific oxyfuel cutting tasks: <ul style="list-style-type: none"> • Straight line and square shapes • Piercing and slot cutting • Bevels • Washing

	Describe the operation of motorized, portable oxyfuel cutting machines.
	Gaskets
Registry ID Number:	Module Title and Objectives:
34106-10	Cutting and Fitting Gaskets
	Identify and explain gasket types.
	Identify and explain gasket materials.
	Install gaskets.
	Boiler Fundamentals
Registry ID Number:	Module Title and Objectives:
34103-10	Boilermaking Tools
	List the safety precautions associated with: <ul style="list-style-type: none"> • Hand tools • Electric tools • Pneumatic tools • Hydraulic tools
	Identify tools used by boilermakers: <ul style="list-style-type: none"> • Hand tools • Electrical tools • Pneumatic tools • Hydraulic tools
	Select the tools required for given applications.
34202-11	Identifying and Installing Valves
	Identify types of valves that start and stop flow.
	Identify types of valves that regulate flow.
	Identify types of valves that relieve pressure.
	Identify types of valves that regulate the direction of flow.
	Interpret valve markings and nameplate information.
34205-11	Fasteners and Anchors
	Identify and explain the use of threaded fasteners.
	Identify and explain the use of anchors.
	Install fasteners and anchors.
34401-12	Advanced Mechanical Trade Math
	Use tables of equivalents.
	Use unit conversion tables.
	Calculate the weight of objects.
	Construction Drawings
Registry ID Number:	Module Title and Objectives:
34204-11	Drawings and Detail Sheets
	Identify parts of drawings.

	Identify types of drawings.
	Interpret drawing indexes and line lists.
34402-12	Advanced Boilermaking Construction Drawings
	Identify symbols and abbreviations on piping and instrumentation drawings (P&IDs).
	Read and interpret the following: <ul style="list-style-type: none"> • GPS coordinates, control points, and elevation • P&IDs, plan views, and section views • Isometric drawings • Spool drawings taken from isometric drawings • Boiler plan views, section views, and details
	Rigging
Registry ID Number:	Module Title and Objectives:
15206-07	Rigging
	Identify and describe the uses of common rigging hardware and equipment.
	Inspect common rigging equipment.
	Identify special rigging equipment, including: <ul style="list-style-type: none"> • Chain hoists • Come-alongs • Jacks • Tugger
	Identify knots used in rigging.
	Identify the correct hand signals to guide a crane operator.
	Identify basic rigging and crane safety procedures.
	Explain load balancing.
	Tubing and Piping
Registry ID Number:	Module Title and Objectives:
34203-10	Pipe Hangers and Supports
	Identify types of pipe hangers and supports.
	Identify and explain the types of variable spring can supports.
08205-06	Threaded Pipe Fabrication
	Identify and explain the materials used in threaded piping systems.
	Identify and explain pipe fittings.
	Read and interpret screwed fitting joint drawings.
	Identify and explain types of threads.
	Determine pipe lengths between joints.
	Calculate offsets.
34308-11	Testing Piping Systems and Equipment
	List pretest requirements.
	Describe service and flow tests.
	Explain head pressure tests.
	Describe hydrostatic tests.
	Towers and Exchangers

Registry ID Number:	Module Title and Objectives:
34307-11	Towers and Exchangers
	Explain basic refinery processes, vessel coding, and drums.
	Identify and explain different types of distillation towers and their functions.
	Identify and explain different types of distillation tower components and their functions.
	Describe how heaters, heat exchangers, and coolers operate.
34411-12	Advanced Exchangers
	Identify exchangers and components.