



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

**INDUSTRIAL PIPEFITTER V4  
PFT08\_03**

*September 2013, updated 2022*

**Focus Statement**

An advanced pipefitter:

- Masters mathematical functions and knows their application to pipefitting.
- Is able to properly identify and master hand, power tools, and equipment, including equipment for rigging and their procedures.
- Performs and knows how to fabricate butt weld pipe, threaded pipe, and socket welds.
- Is able to identify and install above, underground, and specialty piping, hangers and supports, valves and in-line specialties.
- Understands how to perform stress relieving, aligning, and testing

**Overview**

- Three-hour closed-book examination
- May use the following resources:
  - A non-programmable scientific or pipe-specific calculator
  - *The Pipefitters Blue Book* by W.V. Graves
- No extra papers, books, notes or study materials are allowed
- The minimum passing score is 75
- A corresponding hands-on Performance Verification is available

**NCCER Curriculum**

All NCCER knowledge assessments are referenced to NCCER's curriculum modules as listed on this specification sheet. You may order modules from Pearson (800.922.0579) or from NCCER's Online Catalog at [www.nccer.org](http://www.nccer.org).

**Assessment Development**

All questions are developed and approved by subject matter experts under the direction of NCCER.

**Credentials**

Upon successful completion of the knowledge assessment, NCCER will send applicable credentials to the assessment center.

**Score Report and Training Prescription**

Each candidate will have access to their assessment results including their overall score and recommended training.

**NCCER Registry**

Knowledge assessment results are recorded in NCCER's Registry and become a part of the portable record of an individual's NCCER credentials.

**Knowledge Assessment Contents:**

<b>Content Domain</b>	<b>Number of Questions</b>
<b>Safety</b> [08105, 08106, 08208, 08309]	16
<b>Math</b> [00102, 08204, 08304]	14
<b>Pipefitting Fundamentals</b> [08102, 08103, 08201, 08303]	16
<b>Cutting</b> [08104, 08307]	8
<b>Fabrication</b> [ 08205, 08206, 08207, 08402]	18
<b>Construction Drawings</b> [08202, 08401]	11
<b>Rigging</b> [08301, 08302]	9
<b>Valves, Hangers, and Supports</b> [08203, 08308, 08403]	15
<b>Pipefitting Specialties</b> [08209, 08306, 08405, 08406]	18
<b>Total Number of Questions</b>	<b>125</b>



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Learning Objectives related to Assessment:

Safety	
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08105</b>	<b>Ladders and Scaffolds</b>
	Identify the different types of ladders and scaffolds used on a work site.
	Describe how to safely use ladders and scaffolding.
<b>08106</b>	<b>Motorized Equipment I</b>
	Identify and explain the operation and use of the following motor-driven equipment <ul style="list-style-type: none"> <li>• Welding machines</li> <li>• Portable generators</li> <li>• Air compressors</li> <li>• Portable pumps</li> <li>• Aerial lifts</li> <li>• Forklifts</li> <li>• Compaction equipment</li> <li>• Trenching equipment</li> <li>• Backhoe loaders</li> <li>• Mobile cranes</li> </ul>
<b>08208</b>	<b>Excavations</b>
	Identify and explain the use of shoring materials.
	Determine and set the grade and elevation of a trench.
<b>08309</b>	<b>Testing Piping Systems and Equipment</b>
	Perform pretest requirements.
	Perform hydrostatic tests
	Explain how to perform steam blow tests.
Math	
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>00102</b>	<b>Introduction to Construction Math</b>
	Use a standard ruler, a metric ruler, and a measuring tape to measure.
	Convert fractions to decimals and decimals to fractions.
	Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.
<b>08204</b>	<b>Pipefitting Trade Math</b>
	Use formulas to solve basic problems.
	Solve area problems.
	Solve volume problems.
	Solve circumference problems.
	Solve right triangle problems using the Pythagorean theorem.
<b>08304</b>	<b>Advanced Trade Math</b>
	Perform right angle trigonometry.
	Calculate takeouts using trigonometry.

<b>Pipefitting Fundamentals</b>	
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08102</b>	<b>Pipefitting Hand Tools</b>
	Identify tools and state their uses.
<b>08103</b>	<b>Pipefitting Power Tools</b>
	Identify and explain the uses of portable grinders.
	Explain the proper and safe operation of machines used in pipe joint preparation: <ul style="list-style-type: none"> <li>• Pipe threaders</li> <li>• Portable power drives</li> <li>• Pipe bevelers</li> </ul>
<b>08201</b>	<b>Piping Systems</b>
	Identify and explain the types of piping systems.
	Identify piping systems according to color-coding.
	Explain the effects and corrective measures for thermal expansion in piping systems.
<b>08303</b>	<b>Standards and Specifications</b>
	Understand and interpret pipefitting standards and codes
<b>Cutting</b>	
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08104</b>	<b>Oxyfuel Cutting</b>
	Identify and explain the use of oxyfuel cutting equipment.
<b>08307</b>	<b>Field Routing and Vessel Trim</b>
	Determine the load weight for erection equipment.
	Determine the support needs.
	Select and install erection materials.
<b>Fabrication</b>	
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08205</b>	<b>Threaded Pipe Fabrication</b>
	Identify and explain the materials used in threaded piping systems.
	Read and interpret screwed fitting joint drawings.
	Identify and explain types of threads.
	Calculate offsets.
<b>08206</b>	<b>Socket Weld Pipe Fabrication</b>
	Identify and explain socket weld fittings.
	Read and interpret socket weld piping drawings.
	Determine pipe lengths between socket weld fittings.
<b>08207</b>	<b>Butt Weld Pipe Fabrication</b>
	Identify butt weld piping materials and fittings.
	Determine pipe lengths between fittings.
<b>08402</b>	<b>Advanced Pipe Fabrication</b>
	Calculate simple piping offsets.
	Fabricate tank heating coils.
	Lay out three- and four-piece mitered turns.
	Perform geometric layout of pipe laterals and supports.

	<b>Construction Drawings</b>
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08202</b>	<b>Drawings and Detail Sheets</b>
	Identify parts of drawings.
	Identify types of drawings.
	Interpret drawing indexes and line lists.
<b>08401</b>	<b>Advanced Blueprint Reading</b>
	Identify piping arrangement drawings.
	Read and interpret GPS coordinates, control points, and elevation.
	Read and interpret P&IDs, plan views, and section views.
	Identify isometric drawings.
	<b>Rigging</b>
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08301</b>	<b>Rigging Equipment</b>
	Identify and describe the uses of common rigging hardware and equipment.
	Perform a safety inspection on hooks, slings, and other rigging equipment.
	Describe common slings and determine sling capacities and angles.
<b>08302</b>	<b>Rigging Practices</b>
	Identify and use the correct hand signals to guide a crane operator.
	<b>Valves, Hangers, and Supports</b>
<b>Module Number:</b>	<b>Module Title Objectives:</b>
<b>08203</b>	<b>Identifying and Installing Valves</b>
	Identify types of valves that start and stop flow.
	Identify types of valves that regulate flow.
	Identify valves that regulate the direction of flow.
	Identify types of valve actuators.
	Explain how to properly store and handle valves.
<b>08308</b>	<b>Pipe Hangers, Supports, &amp; Spring Cans</b>
	Identify types of pipe hangers and supports.
	Identify and explain the types of spring can supports.
	Explain the storing and handling procedures for spring can supports.
<b>08403</b>	<b>Stress Relieving and Aligning</b>
	Explain thermal expansion, anchors, and cold springing.
	Explain stress-relief procedures.
	Align pipe flanges to rotating equipment nozzles.
	<b>Specialties</b>
<b>08209</b>	<b>Underground Pipe</b>
	Identify and explain the types of underground piping materials.
	Identify the size classifications of underground pipe.
	Identify and explain the use of underground pipe fittings.
<b>08306</b>	<b>Introduction to Above Ground Pipe Installation</b>
	Store pipe and materials.
	Identify types of flanges.
	Explain the location of flange bolt holes.

<b>08405</b>	<b>In-Line Specialties</b>
	Identify in-line specialties.
<b>08406</b>	<b>Special Piping</b>
	Install flared and compression joints, using copper tubing.
	Solder and braze joints, using copper tubing.
	Bend pipe to a specified radius
	Install grooved pipe couplings.