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Trade Profile
Boilermaker

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Structure of the Trade Profile

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

Description of the Boilermaker trade: an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities

Task: distinct actions that describe the activities within a major work activity

Sub-task: distinct actions that describe the activities within a task

Description of the Boilermaker Trade

““Boilermaker” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by boilermakers.

Boilermakers construct, fabricate, weld, assemble, install, erect, alter, maintain, repair, dismantle, demolish and test various items. These include, but are not limited to pressure vessels, heat exchangers, steam generators, boilers, economizers, air heaters, deaerators, induced draft (ID) and forced draft (FD) fans, tanks, pollution control devices and systems, duct systems, furnaces, reactors, water towers and reservoirs, penstocks, scroll casing, stacks and other related components and parts, as well as their access structures, assemblies and internals, inclusive of piping and external piping up until the first flange, including all types of structural and plate work on dust, air, gas, steam, oil, water and other liquid-tight containers.

Boilermakers work from engineer-approved drawings to fabricate components from steel or other materials. They calculate, select and attach rigging and work with cranes and other hoisting devices to lift components into place. The systems must be tested for leaks and other defects and deficiencies to ensure they are operating safely and efficiently.

Boilermakers require a good understanding of welding methods and procedures. However, while welding is a component of this trade, jurisdictions may or may not permit certain welding processes without further certification.

Boilermakers are employed in industries that are governed by various codes and standards in metal fabricating, construction, shipbuilding, petroleum, mining, smelting and power generation (e.g., hydro, nuclear, thermal, solar, tidal). They may be employed in construction and maintenance in a variety of industrial workplaces such as pulp mills, water treatment plants, steel mills, cement, chemical, fertilizer and potash plants, breweries, shipyards, offshore platforms, mines and power generation and co-generation stations, as well as ethanol, oil and gas extraction facilities, upgraders and refineries where the installation, repair, and maintenance, or demolition of the above equipment is required.

Boilermakers use both hot and cold working methods to shape steel components and other materials to form boilers, tanks and vessels. They must use various metal forming machines such as plate shears, punch presses and bending rolls. Tools such as levels, wedges, grinders and cutting torches are used to lay out, fit and smooth edges so the parts fit together. They also use a variety of test equipment and measuring devices.

Work is performed indoors or outdoors and may be at extreme heights or underground. Boilermakers can safely work in environments containing hazards and conditions such as, vibration, excessive noise, fumes, asbestos and other toxic environments, confined spaces, extreme temperatures and radiation. Safety training and procedures are a

priority to ensure risk is minimized and to avoid occupational injuries and long-term impacts.

Key attributes for people wanting to enter the Boilermaker trade are good hand-eye coordination, manual dexterity, and mechanical and mathematical aptitude. Boilermakers must possess the full range of knowledge, abilities and skills required of the trade, including an understanding of mechanical drawings. They also require strength and stamina to work with heavy loads and equipment. Boilermakers must be willing to travel and adapt to changing work environments (e.g., confined spaces, working at heights and working under supplied air). It is common in this trade to work long hours and many consecutive shifts.

This analysis recognizes similarities with the work of metal fabricators, industrial mechanics (millwrights), steamfitters/pipefitters, ironworkers and welders.

With experience, boilermakers may act as mentors and trainers to apprentices in the trade. They may also advance to supervisory positions, quality assurance inspectors and safety personnel.

Boilermaker
Task Matrix

Major Work Activity A – Performs common occupational skills 20%

Task A-1 Maintains safe and healthy workplace 17%	Sub-task A-1.01 Maintains safe work environment	Sub-task A-1.02 Uses personal protective equipment (PPE) and safety equipment	Sub-task A-1.03 Monitors confined spaces
	Sub-task A-1.04 Participates in healthy and respectful work environment		
Task A-2 Uses, inspects and maintains tools, equipment and work platforms 30%	Sub-task A-2.01 Uses hand, measuring and layout tools	Sub-task A-2.02 Uses power tools	Sub-task A-2.03 Uses shop equipment
	Sub-task A-2.04 Uses cutting and welding tools and equipment	Sub-task A-2.05 Uses hydraulic equipment and pneumatic tools and equipment	Sub-task A-2.06 Uses work platforms, scaffolding and access equipment
	Sub-task A-2.07 Uses mobile elevating work platforms (MEWP)		
Task A-3 Organizes work 17%	Sub-task A-3.01 Organizes project tasks and procedures	Sub-task A-3.02 Uses documents, drawings and specifications	Sub-task A-3.03 Handles materials and components
	Sub-task A-3.04 Demobilizes site		

Task A-4 Performs cutting and welding activities 36%	Sub-task A-4.01 Cuts material	Sub-task A-4.02 Prepares weld joints for fitting	Sub-task A-4.03 Fits weld joints
	Sub-task A-4.04 Performs tack welds	Sub-task A-4.05 Performs basic welding	Sub-task A-4.06 Performs advanced welding
Task A-5 Maintains continuous learning 0%	Sub-task A-5.01 Upskills in new trade practices and procedures	Sub-task A-5.02 Upskills in emerging technologies	
Task A-6 Uses communication and mentoring techniques 0%	Sub-task A-6.01 Uses communication techniques	Sub-task A-6.02 Uses mentoring techniques	

Major Work Activity B –Performs rigging, hoisting and positioning 30%

Task B-7 Plans lift 34%	Sub-task B-7.01 Determines load	Sub-task B-7.02 Performs pre-lift analysis	Sub-task B-7.03 Selects rigging, hoisting and positioning equipment
	Sub-task B-7.04 Secures lift area		
Task B-8 Rigs, hoists and positions load 52%	Sub-task B-8.01 Inspects rigging, hoisting and positioning equipment	Sub-task B-8.02 Fabricates rigging accessories and components	Sub-task B-8.03 Assembles rigging, hoisting and positioning equipment
	Sub-task B-8.04 Attaches rigging equipment to load	Sub-task B-8.05 Performs hoisting and positioning operations	Sub-task B-8.06 Secures load before rigging removal
Task B-9 Performs post-lift activities 14%	Sub-task B-9.01 Conducts post-lift inspection	Sub-task B-9.02 Disassembles rigging, hoisting and positioning equipment	Sub-task B-9.03 Maintains rigging, hoisting and positioning equipment

Major Work Activity C – Completes new construction 19%

Task C-10 Performs fabrication 33%	Sub-task C-10.01 Lays out components for fabrication	Sub-task C-10.02 Cuts components for fabrication	Sub-task C-10.03 Forms components for fabrication
	Sub-task C-10.04 Constructs components		
Task C-11 Assembles and fits vessels and components 44%	Sub-task C-11.01 Aligns vessels and components	Sub-task C-11.02 Fits vessels and components	
Task C-12 Fastens components 23%	Sub-task C-12.01 Bolts components	Sub-task C-12.02 Expands tubes	Sub-task C-12.03 Lays up fibreglass

Major Work Activity D – Performs repairs, maintenance, upgrading and testing 31%

Task D-13 Services vessels and components 64%	Sub-task D-13.01 Inspects vessels and components for defects	Sub-task D-13.02 Prepares vessels and components for servicing	Sub-task D-13.03 Repairs vessels and components
	Sub-task D-13.04 Performs preventative maintenance and upgrades	Sub-task D-13.05 Tests materials, vessels and components	
Task D-14 Removes vessels and components 36%	Sub-task D-14.01 Dismantles vessels and components	Sub-task D-14.02 Removes materials and components	