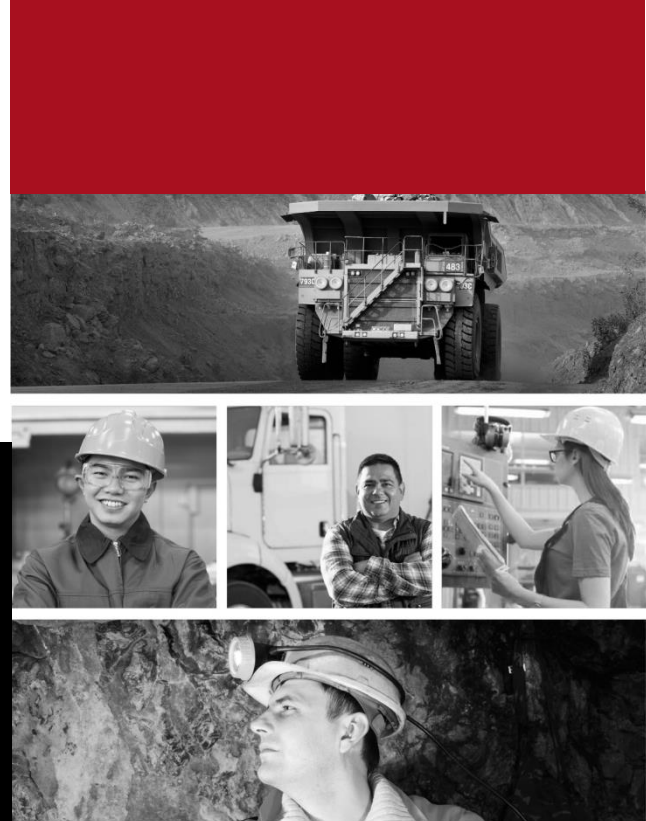


# EXPLORE YOUR OPTIONS IN MINING

This document contains profiles for some occupations that are important for the mining industry. The profiles provide information on some of the key duties, working conditions, and requirements for each of those occupations.



Here are some key skills that employers in the mining industry look for in the new employees for most occupations:

- Willingness to learn
- Ability to follow instructions
- Problem solving skills
- Teamwork/Good interpersonal skills
- Dependable
- Oral and written communication skills

Depending on the occupations, employers might also require the following:

- Ability to pass fitness-for-work test
- Ability to pass drug test



FAR NORTHEAST TRAINING BOARD (FNETB)  
your Local Employment Planning Council

COMMISSION DE FORMATION DU NORD-EST (CFNE)  
votre Conseil Local de Planification de l'Emploi



## Ontario

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## Security Guards and Related Security Service Occupations

Individuals who choose this career will protect property, people and information. Their responsibilities involve preventing risk, enforcing regulations and maintaining order and safety.



Salary

**\$27,000 to 47,000\***



Education

**High school or equivalent**



Demand to 2028

**High**

**May include job titles such as** security guard, gate attendant, security patrol officer, commissionaire, vault custodian, security investigator, surveillance operator, theft prevention officer.

### Typical Job Duties

- Control access to establishments, operate security control-room equipment and patrol assigned areas to guard against theft, vandalism and fire.
- Enforce regulations to maintain order and resolve conflicts and to monitor establishment activities.
- Ensure safety and emergency procedures are followed.
- Issue passes and direct visitors to appropriate areas.

### Working Conditions

- Environment may require ear and eye protection; may be indoors or outdoors.
- Shift work may be required, including nights and weekends; remote locations may operate on fly-in/fly-out schedules.
- Security personnel may experience stress from dealing with emergency situations or interpersonal conflict.

### Employment Requirements

- A college diploma in law and security or police technology may be required.
- Training is provided for airport security guards and establishment-specific training may be provided for security occupations in this unit group.
- Security guards carrying firearms require a license.
- Armoured car drivers require a valid Possession and Acquisition License (PAL) for both restricted and non-restricted firearms.
- Corporate security officers may require experience as a police officer.

Sources:

\*Regional Labour Market Information, jobbank.gc.ca, 2017; National Occupational Classification, noc.esdc.gc.ca, 2017

## Central Control and Process Operators

If you choose a job in this category, you'll operate and monitor process control equipment, machinery and computers involved in mineral and metal production.



**Salary**  
**\$37,000 to 78,000\***



**Education**  
**High school or equivalent**



**Demand to 2028**  
**Moderate**

**May include job titles such as** control room or board operator, instrumentation and control technician, alloy or purity control, central control caster, controller, copper/electrolytic refinery process operator.

### Typical Job Duties

- Co-ordinate and monitor the operation of a particular aspect of mineral ore, metal and cement processing production.
- Operate multi-function central process control machinery to grind, separate, filter, melt, roast, treat, refine or otherwise process mineral ores.
- Observe computer printouts, video monitors and gauges.
- Co-ordinate and supervise production crew.
- Start up and shut down the production system in cases of emergency or as required by schedule.
- Provide or organize training for members of production crew.
- Maintain shift log of production and other data and prepare production and other reports.

### Working Conditions

- Temperature, air quality and light levels may vary depending on the workplace.
- Working environment may require ear and eye protection.
- Shift work may include nights and weekends; remote locations may operate on fly-in/fly-out schedules.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- Completion of secondary school is required.
- A college diploma may be required for some positions in this group.
- On-the-job training is provided.
- Several years of experience as a machine or process operator, usually in the same company or production department, are required.

## Chemist

Chemists in the mining sector carry out research, analysis and quality control activities that support industrial operations. They provide technical expertise in office or field settings and may do theoretical or applied research.



Salary

**\$52,000 to 127,000\***



Education

**4-yr post-secondary degree**



Demand to 2028

**Moderate**

**May include job titles such as** electrochemist, fermentologist, hydrochemist, research scientist, spectrometrist, chemistry researcher, physical chemist, environmental chemist, industrial process control chemist.

### Typical Job Duties

- Analyze, synthesize, purify, modify and characterize chemical or biochemical compounds.
- Develop and conduct programs of analysis and programs of sample and data collection.
- Conduct research to develop new chemical formulations and processes.
- Conduct research to discover, develop, refine and evaluate new products.
- Conduct fundamental and applied research into the synthesis and properties of chemical compounds.
- Participate in interdisciplinary research and development projects.
- Act as technical consultant in a particular field of expertise.

### Working Conditions

- Work is typically carried out indoors under conditions that may expose workers to fumes and odors, and injuries resulting from chemical exposure.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- A bachelor's degree in chemistry, biochemistry or a related discipline is required.
- A master's or doctoral degree is usually required for employment as a research chemist.
- Licensing by a provincial association of chemists is available, but voluntary, in Ontario.

## Construction Millwrights and Industrial Mechanics

Individuals who choose this career install, maintain, and repair stationary industrial machinery and mechanical equipment, including robotic systems.



Salary

**\$40,000 to 78,000\***



Education

**College | Apprenticeship**



Demand to 2028

**High**

**May include job titles such as** industrial millwright, industrial mechanic, welding equipment mechanic, utilities mechanic, machine adjuster, machine maintenance technician.

### Typical Job Duties

- Read blueprints, diagrams and schematic drawings to determine work procedures.
- Install, align, dismantle and move stationary industrial machinery and mechanical equipment.
- Operate hoisting and lifting devices such as cranes, jacks and tractors.
- Inspect and examine machinery and equipment.
- Install, troubleshoot and maintain power transmission, vacuum, hydraulic and pneumatic systems and programmable logic controls.
- Adjust machinery and repair or replace defective parts.
- Clean, lubricate and perform other routine maintenance work on machinery.

### Working Conditions

- Environment may require ear and eye protection; may be indoors or outdoors.
- Shift work may be required, including nights and weekends; remote locations may operate on fly-in/fly-out schedules.
- Workplace hazards such as moving machinery and working at heights may pose safety concerns.

### Employment Requirements

- Completion of secondary school and training courses or a vocational program is usually required.
- Completion of a three- to four-year apprenticeship program or a combination of over five years of work experience and industry courses in industrial machinery repair or millwrighting is usually required to be eligible for trade certification.
- Industrial mechanic (millwright) and construction millwright trade is available, but voluntary, in Ontario.
- Red Seal endorsement is also available to qualified industrial mechanics or millwrights upon successful completion of the interprovincial Red Seal examination.

## Drillers and Blasters

Drillers and blasters are two separate occupations; they work closely together and may carry out both activities. Drillers operate tracked or mobile drilling machines to bore holes in mines and quarries. Blasters fill holes with explosives and detonate them to safely dislodge ore and rock.



Salary  
**\$38,000 to 64,000\***



Education  
**High school or equivalent**



Demand to 2028  
**High**

**May include job titles such as** diamond driller, drilling machine operator, core drill operator, open pit driller, quarry driller, rotary drilling machine operator, surface mining blaster, construction blaster, open-pit blaster.

### Typical Job Duties

**Drillers perform some or all of the following duties:**

- Drive and operate drilling machines to bore blast holes.
- Operate drilling machines to drill blast holes in rock at road or other construction sites.
- May measure location and stake out pattern of holes to be drilled, load blast holes with explosives and detonate explosives to dislodge coal, ore or rock.

**Blasters perform some or all of the following duties:**

- Read instructions or diagrams, lay out drill pattern and determine depth and diameter of blast holes and conduct field tests.
- Assemble or direct other workers to assemble primer charges.
- Load explosives in blast holes.
- Connect electrical wires, detonating cords or fuses into series.
- Handle, store and transport explosives and accessories in accordance with regulations and ensure that safety procedures are observed.

### Working Conditions

- Work takes place in hazardous locations such as construction sites and mines.
- Workers may be exposed to dust, noise and flying debris.
- Shift work may include nights and weekends; remote sites may operate on fly-in/fly-out schedules.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- Completion of secondary school is usually required.
- On-the-job training is provided.
- Experience as a heavy equipment operator may be required for drillers.
- Experience as a blaster helper in surface mining and quarrying or construction may be required for blasters.
- Provincial blasting license is usually required for blasters.

## Geologists

Geologists oversee exploration and research programs to identify and extract natural resources. They work for mining companies, private sector consulting firms, the public sector, or are self-employed.



Salary

**\$39,000 to 118,000\***



Education

**4-yr university degree**



Demand to 2028

**High**

**May include job titles such as** geochemist, mineralogist, geophysicist, engineering geologist, biostratigrapher, geoscientist, hydrogeologist, geomorphologist.

### Typical Job Duties

- Conduct theoretical and applied research.
- Plan, direct and participate in geological, geochemical and geophysical field studies, drilling and geological testing programs.
- Develop models and applied software for the analysis and interpretation of data.
- Plan and conduct analytical studies of core samples, drill cuttings and rock samples.
- Assess the size, orientation and composition of mineral ore bodies and hydrocarbon deposits.
- Identify deposits of construction materials and determine their characteristics and suitability.
- Conduct geological and geophysical studies for regional development.
- Recommend the acquisition of lands, exploration and mapping programs and mine development.

### Working Conditions

- New geologists tend to spend considerable time in the field, often in remote areas that require them to stay in field camps for weeks or months at a time.
- May require work in extreme weather conditions.
- More experienced geologists may choose to advance to administrative office jobs.

### Employment Requirements

- Geoscientists require a university degree in geology, geochemistry, geophysics or a related discipline.
- Registration with a provincial association of professional engineers, geologists, geophysicists or geoscientists is usually required for employment and is mandatory to practice in Ontario.
- Geologists and geophysicists are eligible for registration following graduation from an accredited educational program and after several years of supervised work experience.

## Heavy Equipment Operators

People who choose this career operate heavy equipment in surface mining, quarrying, and in building and maintaining roads and infrastructure. Equipment might include backhoes, loaders, bulldozers, rock trucks and excavators.



Salary

**\$37,000 to 66,000\***



Education

**High school or equivalent**



Demand to 2028

**High**

**May include job titles such as** heavy equipment operating engineer, road machine operator, dozer operator, earth moving equipment operator, payloader operator, road grader operator, boom-conveyor operator.

### Typical Job Duties

- Operate heavy equipment such as backhoes, bulldozers, loaders and graders.
- Operate bulldozers or other heavy equipment to clear brush and stumps prior to logging activities and to build roads at logging and surface mining sites.
- Operate heavy equipment with pile driver head.
- Operate heavy dredging equipment.
- Operate heavy paving and surfacing equipment.
- Operate power shovels to excavate rock, ore or other materials from open-pit mines, strip mines, quarries or construction pits.
- Operate heavy equipment to move, load and unload cargo.
- Conduct pre-operational checks on equipment and clean, lubricate and refill equipment.

### Working Conditions

- Work often takes place in hazardous locations such as construction sites and mines.
- Workers may be exposed to dust, noise and vibration.
- Shift work may include nights and weekends; remote locations may operate on fly-in/fly-out schedules.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- Completion of a one- to two-year apprenticeship program or some high school, college or industry courses in heavy equipment operating combined with on-the-job training are required.
- Trade certification for heavy equipment operator is available, but voluntary, in Ontario.
- Internal company certification may be required by some employers.
- Red Seal endorsement is also available to qualified heavy equipment operators upon successful completion of the interprovincial Red Seal examination.



## Heavy-Duty Equipment Mechanics

Heavy duty equipment mechanics diagnose problems, repair, adjust, overhaul and maintain heavy equipment vehicles used in mining, quarrying, construction and other industrial sites.



Salary

**\$41,000 to 79,000\***



Education

**High school or equivalent**



Demand to 2028

**High**

**May include job titles such as** construction mechanic, diesel engine repairer, combination-heavy equipment mechanic, crane service technician, fuel injection unit servicer.

### Typical Job Duties

- Check bulldozers, cranes, graders and other heavy construction, agricultural, logging and mining equipment for proper performance and inspect equipment to detect faults and malfunctions.
- Diagnose faults or malfunctions using computerized and other testing equipment.
- Adjust equipment and repair or replace defective parts, components or systems, using hand and power tools.
- Test repaired equipment for proper performance and to ensure that work meets manufacturers' specifications.
- Clean, lubricate and perform other routine maintenance work on equipment.
- Service attachments and working tools.
- May perform repair work on heavy trucks.

### Working Conditions

- Work often takes place in hazardous locations such as construction sites and mines.
- Heavy-duty equipment mechanics may be required to lift heavy parts and tools, and work in awkward or cramped spaces.
- Workers may be exposed to dust, noise and oily or greasy environments.
- Remote locations may operate on fly-in/fly-out schedules with shift work.

### Employment Requirements

- Completion of a three-to five-year apprenticeship program or a combination of over four years of work experience and industry courses in heavy equipment repair is usually required to be eligible for trade certification.
- Heavy-duty equipment technician trade certification is available, but voluntary, in Ontario.
- Red Seal endorsement is available to qualified heavy duty equipment technicians upon successful completion of the interprovincial Red Seal examination.

## Industrial Electricians

If you choose this career, you will inspect, install, maintain, test, upgrade, troubleshoot and repair industrial electrical equipment and electronic controls in mining and industrial environments.



Salary

**\$39,000 to 78,000\***



Education

**College | Apprenticeship**



Demand to 2028

**High**

**May include job titles such as** mill or mine electrician, plant maintenance electrician, industrial electrical repairer, plant electrician, industrial electrician apprentice.

### Typical Job Duties

- Read and interpret drawings, blueprints, schematics and electrical code specifications.
- Install, examine, replace or repair electrical wiring, receptacles, switch boxes, conduits, feeders, fibre-optic and coaxial cable assemblies, lighting fixtures and other electrical components.
- Test electrical and electronic equipment and components for continuity, current, voltage and resistance.
- Maintain, repair, install and test switchgear, transformers, switchboard meters, regulators and reactors.
- Maintain, repair, test and install electrical motors, generators, alternators, industrial storage batteries and hydraulic and pneumatic electrical control systems.
- Troubleshoot, maintain and repair industrial electrical and electronic control systems and other related devices.
- Conduct preventive maintenance programs and keep maintenance records.

### Working Conditions

- Duties may be carried out indoors or outdoors in all types of weather.
- Workers may be exposed to noise, dirt and fumes, and work in cramped spaces or awkward positions.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- Completion of secondary school is usually required.
- Completion of a four- or five-year industrial electrician apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in industrial electrical equipment is usually required to be eligible for trade certification.
- Trade certification for industrial electricians is available, but voluntary, in Ontario.
- Red Seal endorsement is also available to qualified industrial electricians upon successful completion of the interprovincial Red Seal examination.

## Metallurgical and Materials Engineers

Plan, design and develop machinery and processes to concentrate, extract, refine and process metals, alloys and other materials such as semiconductors and composites.



Salary

**\$55,000 to 140,000\***



Education

**4-yr university degree**



Demand to 2028

**Moderate**

**May include job titles such as** electrometallurgical engineer, hydrometallurgical engineer, metallurgical engineer, smelting plant engineer, foundry engineer, corrosion engineer, extractive metallurgy engineer.

### Typical Job Duties

- Conduct studies and design, develop and specify the processes, and machinery to concentrate, extract, refine and process metals from ores.
- Conduct studies on the properties and characteristics of materials.
- Conduct chemical and physical analytical studies, failure analyses and other studies and recommend material selection, design of materials, corrosion control measures, operational testing and other procedures.
- Co-ordinate production testing and control of metal refining, smelting or foundry operations or non-metallic materials production operations.
- Supervise technologists, technicians and other engineers and scientists.

### Working Conditions

- Engineers typically work in an office environment.
- Workers may be exposed to noise, dirt and fumes, and work in cramped spaces or awkward positions.
- Employees must always wear personal protective equipment and follow strict safety procedures.

### Employment Requirements

- A bachelor's degree in metallurgical, materials, ceramic or chemical engineering or in a related engineering discipline is required.
- Licensing by a provincial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer.
- Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

## Supervisors, Mining and Quarrying

Supervisors in mining and quarrying coordinate and oversee workers involved in mining operations at both underground and surface mines, and quarries.



Salary

**\$30,000 to 102,000\***



Education

**High school or equivalent**



Demand to 2028

**High**

**May include job titles such as** mining boss, shift boss, mine captain, mine foreperson, mining supervisor, mining and drilling supervisor, construction supervisor, motorman/motorwoman.

### Typical Job Duties

- Supervise, co-ordinate and schedule the activities of workers who extract coal, minerals and ore; operate underground conveyances; and perform other services in support of underground mining.
- Establish methods to meet work schedules and confer with managerial and technical personnel, other departments and contractors to resolve problems and co-ordinate activities.
- Oversee the safety of the mining or quarrying operations.
- Resolve work problems and recommend measures to improve productivity.
- Requisition materials and supplies.
- Train workers in job duties, safety procedures and company policies.
- Recommend personnel actions such as hirings and promotions.
- Prepare production and other reports.

### Working Conditions

- Workers may be exposed to noise, dust, fumes, and various weather conditions.
- Work may take place in areas that are unstable.
- Shift work may be required, including nights and weekends; remote locations may operate on fly-in/fly-out schedules.

### Employment Requirements

- Completion of secondary school is required.
- Completion of a college or university program in mining technology or engineering may be required for some positions in this group.
- Several years of experience in the occupations supervised are usually required.
- Provincial certification as an underground mine supervisor, shift boss, or coal mining supervisor may be required.

## Supervisors, Mineral and Metal Processing

Individuals in this occupation supervise and co-ordinate central control and process operators, mineral and metal processing operators, and labourers.



Salary

**\$32,000 to 103,000\***



Education

**High school or equivalent**



Demand to 2028

**Moderate**

**May include job titles such as** mill shift coordinator, mill foreperson, manufacturing foreperson, operations foreperson, concentrator/converter foreperson, mineral processing foreperson.

### Typical Job Duties

- Supervise, co-ordinate and schedule the activities of workers.
- Establish methods to meet work schedules and co-ordinate work activities with other departments.
- Requisition materials and supplies.
- Resolve work problems and recommend work measures to improve productivity and product quality.
- Train staff in job duties, safety procedures and company policies.
- Recommend personnel actions such as hirings and promotions.
- Prepare production and other reports.
- May set up machines and equipment.

### Working Conditions

- Work typically takes place indoors.
- Workers may be exposed to noise, heat, fumes, ultraviolet or visible light that may affect health.
- Shift work may be required, including nights and weekends; remote locations may operate on fly-in/fly-out schedules.

### Employment Requirements

- Completion of secondary school is usually required.
- Post-secondary education in metallurgy, sciences or a related field may be required for some occupations in this unit group.
- Several years of experience in metal manufacturing or mineral/metal processing environment are usually required.

## Transport Truck Drivers

These drivers operate heavy trucks to transport goods and materials over urban, provincial and international routes. They may also drive special purpose trucks or move trailers to and from loading docks within transport yards or lots.



**Salary**  
**\$27,000 to 55,000\***



**Education**  
**No minimum standard**



**Demand to 2028**  
**High**

**May include job titles such as** trucker, long distance hauler, long haul trucker, tractor-trailer driver, shunter, freight hauler, truck owner/operator, transportation escort.

### Typical Job Duties

**Long-haul transport truck drivers perform some or all of the following duties:**

- Operate and drive trucks to transport goods and materials over long distances.
- Plan trip logistics and obtain required documentation to transport goods.
- Perform inspection of vehicle systems, equipment and accessories.
- Administer bills of lading and manually or electronically maintain log books.
- Communicate with dispatcher, other drivers and customers using communication devices and on-board computers.

**Short-haul and local transport truck drivers perform some or all of the following duties:**

- Operate and drive straight trucks to transport goods and materials mainly on local routes and short interurban routes.
- Perform inspection and oversee all aspects of vehicle.
- May drive special purpose trucks.

### Working Conditions

- Most drivers work alone, although some long-haul drivers may work with a co-driver.
- Work requires sitting for long periods, although seats are generally comfortable.
- Many truckers drive at night when traffic is low, for shifts of up to 14 hours.

### Employment Requirements

- Completion of secondary school is usually required.
- On-the-job-training is provided.
- Completion of an accredited driver training course of up to three months duration, through a vocational school or community college, may be required.
- A Class 3 or D license is required to drive straight-body trucks.
- A Class 1 or A license is required to drive long combination vehicles.
- Air brake endorsement (Z) and transportation of dangerous goods (TDG) certification may be required.

## Underground Production and Development Miners

Miners drill, blast, operate mining machinery and perform related duties to extract ore in underground mines. They also build mine shafts and drifts to facilitate mining operations.



Salary

**\$45,000 to 83,000\***



Education

**High school or equivalent**



Demand to 2028

**High**

**May include job titles such as** blast hole driller, shaft inspector, shearer, long-hole driller, scoop tram operator, rockbolter, blockholer, hard rock miner, soft rock miner, mucker, mine worker, diamond driller.

### Typical Job Duties

- Set up and operate drills and drilling machines to produce a designated pattern of blasting holes.
- Operate diamond drills or other specialized drills such as raise boring machinery to test geological formations or to produce underground passageways.
- Set up and operate mining machinery.
- Load explosives, set fuses, and detonate explosives.
- Operate scooptram, load-haul-dump (LHD) machine or mucking machines to load and haul ore.
- Perform duties required to ensure safety and to support the mining advance.
- Perform routine maintenance of mining machinery.

### Working Conditions

- Miners work underground in dark, often damp and hot conditions.
- Workplace hazards include unstable ground, moving machinery, noise, dust and exposure to chemicals.
- Shift work may include nights and weekends; remote location sites may operate on fly-in/fly-out schedules.

### Employment Requirements

- Completion of secondary school is usually required.
- Formal training of up to six weeks followed by extended periods of specialized training as a helper or in support occupations is usually provided.
- Previous experience as a mine labourer or in other mine occupations is usually required.
- May be certified in the basic common core program or as an underground hard rock miner in Ontario.
- Company licensing or certification is often required for occupations in this unit group.

# Welders and Related Machine Operators

Individuals who choose this career make, join and repair metal parts for machinery and equipment using welding machinery and techniques.



Salary

**\$45,000 to 83,000\***



Education

**College | Apprenticeship**



Demand to 2028

**High**

**May include job titles such as** fabrication welder, fitter welder, torch brazer, lead burner, lead welder, metal brazier and heater, welding and soldering machine operator, laser beam welder, maintenance welder.

## Typical Job Duties

Welders perform some or all of the following duties:

- Read and interpret blueprints or welding process specifications.
- Operate manual or semi-automatic welding equipment to fuse metal segments using processes.
- Operate manual or semi-automatic flame-cutting equipment.
- Operate brazing and soldering equipment.
- Operate metal shaping machines.
- Repair worn parts of metal products.

Welding, brazing and soldering machine operators perform some or all of the following duties:

- Operate previously set up welding, brazing and soldering machines to fabricate or repair metal parts.
- Start up, shut down, adjust and monitor robotic welding production line.
- Assist with the maintenance and repair of welding, brazing and soldering equipment.

## Working Conditions

- Working conditions vary depending on location and industry; may be indoors or outdoors.
- Workers may be exposed to extreme temperatures, noise, fumes and ultraviolet or visible light.
- Welders in mining and construction environments may work at heights or from scaffolds or platforms.
- Welders and related machine operators may work shifts, nights and weekends.
- Some welders become self-employed.

## Employment Requirements

- Completion of a three-year apprenticeship program or a combination of over three years of work experience in the trade and some college or industry courses in welding is usually required to be eligible for trade certification.
- Trade certification is available, but voluntary, in Ontario.
- Red Seal endorsement is also available to qualified welders upon successful completion of the interprovincial Red Seal examination.
- Several months of on-the-job training are usually provided to welding, brazing and soldering machine operators.