



International Labour Organization  
Organisation internationale du Travail  
Organización Internacional del Trabajo

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*Updating the  
International Standard Classification of Occupations (ISCO)*

*Draft ISCO-08 Group Definitions:  
Occupations in Metal*

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DEPARTMENT OF STATISTICS

**ISCO 08 Code****3135****Title EN****Metal production process controllers****Lead Statement**

Metal production process controllers operate and monitor multi-function process control machinery and equipment to control the processing of metal converting and refining furnaces, metal-rolling mills, metal – heat-treating – or metal-extrusion plant.

**Task statement**

Tasks include:

- (a) co-ordinating and monitoring the operation of a particular aspect of metal processing production through control panels, computer terminals or other control systems, usually from a central control room;
- (b) operating multi-function central process control machinery to grind, separate, filter, melt, roast, treat, refine or otherwise process metals;
- (c) observing computer printouts, video monitors and gauges to verify specified processing conditions and to make necessary adjustments;
- (d) co-ordinating and supervising production crew such as machine and process operators, assistants and helpers;
- (e) starting up and shutting down the production system in cases of emergency or as required by schedule;
- (f) providing and organising training for members of production crew;
- (g) maintaining shift log of production and other data and preparing production and other reports.

**Included occupations**

Examples of the occupations classified here:

- Blast furnace operator
- Central control caster
- Metal processing control operator
- Rolling mill control operator

**Excluded occupations**

- Ladle pourer - 8121
- Steel roller – 8121
- Metal finishing machine operator - 8122

**Notes****ISCO 88 Code(s)**

8121, 8122, 8123, 8124 part

**ISCO 08 Code****721****Title EN****Sheet and structural metal workers, moulders and welders, and related workers****Lead Statement**

Sheet and structural metal workers, moulders and welders, and related workers, make moulds and cores for casting metal, weld and cut metal parts, make and repair articles of sheet metal, install, erect, maintain and repair heavy metal structures, tackle, cable-cars and related equipment.

**Task statement**

Tasks performed usually include: making moulds and cores for casting metal; casting, welding and shaping metal parts; making and repairing articles of sheet metal such as sheet steel, copper, tin, or brass; installing, erecting, maintaining and repairing heavy metal structures, as well as tackle, cable cars and related equipment.

**Included occupations**

Examples of the occupations classified here:

- 7211 Metal moulders and coremakers
- 7212 Welders and flame cutters
- 7213 Sheet-metal workers
- Structural-metal preparers and erectors
- Riggers and cable splicers

**Excluded occupations****Notes****ISCO 88 Code(s)**

**ISCO 08 Code**

7211

**Title EN****Metal moulders and coremakers****Lead Statement**

Metal moulders and coremakers make moulds and cores for casting metal.

**Task statement**

Tasks include:

- (a) making moulds by hand or using auxiliary machines on a bench for small metal castings, on the foundry floor, or in a pit for large castings;
- (b) making cores for use in metal moulds;
- (c) cleaning and smoothing moulds, core boxes, and repairing surface imperfections;
- (d) moving and positioning work pieces such as mould sections, patterns, and bottom boards, using
- (e) cranes, or signal others to move work pieces;
- (f) positioning patterns inside mould sections and clamping sections together;
- (g) cutting spouts, runner holes and sprue holes into moulds;
- (h) lifting upper mould sections from lower sections and remove moulded patterns.

**Included occupations**

Examples of the occupations classified here:

- Core maker
- Metal Core maker
- Metal casting moulder

**Excluded occupations**

Some related occupations classified elsewhere:

- Core making machine-operator--7223

**Notes****ISCO 88 Code(s)**

7211

**ISCO 08 Code**

7212

**Title EN****Welders and flame cutters****Lead Statement**

Welders and flame cutters weld and cut metal parts using gas flame, electric arc and other sources of heat to melt and cut, or to melt and fuse metal.

**Task statement**

Tasks include:

- (a) welding metal parts using gas flame, or an electric arc, thermite compound or other methods;
- (b) operating resistance-welding machines;
- (c) using blowtorch to make and repair lead linings, pipes, floors and other lead fixtures;
- (d) brazing metal parts together;
- (e) cutting metal pieces using gas flame or an electric arc;
- (f) joining metal parts by hand soldering;
- (g) monitoring the fitting, burning, and welding processes to avoid overheating of parts or warping, shrinking, distortion, or expansion of material;
- (h) examining work pieces for defects and measure work pieces with straightedges or templates to ensure conformance with specifications.

**Included occupations**

Examples of the occupations classified here:

- Brazier
- Flame cutter
- Welder

**Excluded occupations****Notes****ISCO 88 Code(s)**

7212

**ISCO 08 Code**

7213

**Title EN****Sheet-metal workers****Lead Statement**

Sheet-metal workers make, install and repair articles and parts of articles of sheet metal such as sheet steel, copper, tin, brass, aluminium, zinc or galvanised iron.

**Task statement**

Tasks include:

- (a) marking sheet metal for cutting and shaping;
- (b) making and repairing household utensils and other articles in tin, copper and light alloys, or ornamental articles and fittings;
- (c) making and repairing boilers, tanks, vats and similar containers;
- (d) installing and repairing sheet-metal parts of vehicles and aircraft;
- (e) converting blueprints into shop drawings to be followed in the construction and assembly of sheet metal products;
- (f) determining project requirements, including scope, assembly sequences, and required methods and materials, according to blueprints, drawings, and written or verbal instructions;
- (g) inspecting product quality and installation to ensure conformance to specifications.

**Included occupations**

Examples of the occupations classified here:

- Boilersmith
- Coppersmith
- Sheet-metal worker
- Tinsmith

**Excluded occupations****Notes****ISCO 88 Code(s)**

7213

**ISCO 08 Code**

722

**Title EN****Blacksmiths, toolmakers and related trades workers****Lead Statement**

Blacksmiths, toolmakers and related trades workers, hammer and forge bars, rods or ingots of iron, steel and other metals to make and repair various kinds of tools, equipment and other articles, set for operators or set and operate various machine tools, and polish and sharpen surfaces.

**Task statement**

Tasks performed usually include: hammering and forging iron, steel and other metals to make and repair various kinds of tools, equipment and other articles; setting machine tools for operators or setting and operating various machine tools working to fine tolerances; polishing and sharpening metal surfaces and tools.

**Included occupations**

Examples of occupations classified here:

- 7221 Blacksmiths, hammersmiths and forging press workers
- 7222 Toolmakers and related workers
- 7223 Metal working machine tool setters and operators
- 7224 Metal polishers, wheel grinders and tool sharpeners

**Excluded occupations****Notes****ISCO 88 Code(s)**

**ISCO 08 Code**

7221

**Title EN****Blacksmiths, hammersmiths and forging press workers****Lead Statement**

Blacksmiths, hammersmiths and forging-press workers draw wire, hammer and forge bars, rods, ingots and plates of iron, steel or other metals to make and repair various kinds of tools, metal articles, pieces of equipment, agricultural and related implements.

**Task statement**

Tasks include:

- (a) heating metal in forge furnace and manufacturing and repairing articles by drawing, bending,
- (b) cutting, hammering metal on an anvil, punching, shearing, joining and hardening or tempering;
- (c) shaping heated metal into forgings on power hammer equipped with open dies;
- (d) operating closed-die drop hammer to forge metal articles;
- (e) operating a power-press machine equipped with closed dies to forge metal articles;
- (f) drawing wire;
- (g) reading work orders or blueprints to determine specified tolerances and sequences of operations for machine setup;
- (h) measuring and inspecting machine parts to ensure conformance to product specifications.

**Included occupations**

Examples of the occupations classified here:

- Blacksmith
- Drop-hammer worker
- Forging-press worker
- Hammersmith

**Excluded occupations**

Some related occupations classified elsewhere:

- Casting machine-operator-7223
- Machine-tool machine-operator-7223

**Notes****ISCO 88 Code(s)**

7221, part

**ISCO 08 Code**

7222

**Title EN****Toolmakers and related workers****Lead Statement**

Toolmakers and related workers make and repair custom made and specialised tools, sports guns, locks, dies, patterns machinery components and other metal articles using hand and machine tools to work metal to fine tolerances.

**Task statement**

Tasks include:

- (a) reading and interpreting engineering drawings and specifications of tools, dies, prototypes or models;
- (b) preparing templates and sketches, and determining work processes;
- (c) visualizing and computing dimensions, sizes, shapes, and tolerances of assemblies, based on specifications;
- (d) positioning, securing and measuring metal stock or castings to lay out for machining
- (e) setting up, operating and maintaining of conventional and computer numerically controlled machine tools to cut, turn, mill, plane, drill, bore, grind or otherwise shape workpiece to prescribed dimensions and finish;
- (f) fitting and assembling parts to make and repair jigs, fixtures and gauges;
- (g) repairing and modifying sports guns and other small arms;
- (h) making, fitting, assembling, repairing and installing lock parts and locks;
- (i) making and repairing metal patterns for preparation of foundry moulds;
- (j) laying out lines and reference points on metal stock to guide other workers who cut, turn, mill, grind or otherwise shape metal;
- (k) verifying dimensions, alignments, and clearances of finished parts for conformance to specifications, using precision measuring instruments and testing completed items for proper operation.

**Included occupations**

Examples of the occupations classified here:

- Die maker
- Gunsmith
- Jig maker
- Locksmith
- Patternmaker
- Toolmaker

**Excluded occupations**

Some related occupations classified elsewhere:

- Tool production machine-operator - 7223

**Notes****ISCO 88 Code(s)**

7222

**ISCO 08 Code****7223****Title EN****Metal working machine tool setters and operators****Lead Statement**

Metal working machine tool setters and operators set and/or operate, various machine tools working to fine tolerances

**Task statement**

Tasks include:

- (a) setting one or more types of machine tool for production of metal articles in standardised series;
- (b) operating and monitoring metalworking machines, such as lathes, milling, planing, boring, drilling, grinding or honing machines, including multipurpose numerically controlled metalworking machines;
- (c) performing similar tasks when machining plastics and other metal substitutes;
- (d) observing machine operations to detect work piece defects or machine malfunctions, adjusting machines as necessary;
- (e) inspecting work pieces for defects, and measuring work pieces to determine accuracy of machine operation, using rules, templates, or other measuring instruments;
- (f) changing worn machine accessories, such as cutting tools and brushes, using hand tools.

**Included occupations**

Examples of the occupations classified here:

- Boring machine operator
- Machine tool setter
- Machine tool operator
- Machine tool setter-operator
- Metal turner

**Excluded occupations**

Some related occupations classified elsewhere:

**Notes****ISCO 88 Code(s)****7223, 8211**

**ISCO 08 Code**

7224

**Title EN****Metal polishers, wheel grinders and tool sharpeners****Lead Statement**

Metal wheel-grinders, polishers and tool sharpeners grind and polish metal surfaces and sharpen tools.

**Task statement**

Tasks include:

- (a) operating fixed or portable buffing and polishing machines;
- (b) sharpening cutting tools and instruments using grinding wheels or mechanically operated grinding machines;
- (c) repairing, adjusting and sharpening saw blades and metal teeth of cylinders in textile carding
- (d) machines;
- (e) dressing grinding wheels, according to specifications;
- (f) monitoring machine operations to determine whether adjustments are necessary; stop machines when problems occur;
- (g) inspecting, feeling, and measuring work pieces to ensure that surfaces and dimensions meet specifications;
- (h) selecting and mounting grinding wheels on machines, according to specifications, using hand tools and applying knowledge of abrasives and grinding procedures.

**Included occupations**

Examples of the occupations classified here:

- Metal finisher
- Tool grinder
- Metal polisher
- Knife sharpener

**Excluded occupations**

Some related occupations classified elsewhere:

- Metal finishing machine –operator -8122
- Metal polishing machine operator -8122

**Notes****ISCO 88 Code(s)**

7224

**ISCO 08 Code****812****Title EN****Metal processing and finishing plant operators****Lead Statement**

Metal processing and finishing plant operators, operate and monitor single function process control machinery and equipment to control the conversion, processing and finishing of mineral ores and metals.

**Task statement**

Tasks performed usually include: setting up, preparing and adjusting metal and ore processing and finishing machinery; co-ordinating and monitoring the operation of a particular aspect of metal processing production and finishing; co-ordinating and supervising other workers; verifying equipment for malfunctions, monitoring gauges, carrying out routine operating tests and arranging for maintenance; checking, testing and analyzing sample products; recording data and writing production logs;

**Included occupations**

Examples of occupations classified here:

- 8121 Metal processing plant operators
- 8122 Metal finishing, plating and coating machine operators

**Excluded occupations****Notes****ISCO 88 Code(s)**

**ISCO 08 Code****8121****Title EN****Metal processing plant operators****Lead Statement**

Metal processing plant operators, operate, monitor, adjust and maintain, single process machinery and equipment to process and convert mineral ores and refine, harden, roll and extrude metals.

**Task statement**

Tasks include:

- (a) setting up, preparing and adjusting mineral ore and metal processing machinery to carry out one step in the overall mineral ore or metal processing operation;
- (b) operating single-function machinery to grind, separate, filter, mix, treat, cast, roll, refine or otherwise process metals and mineral ores;
- (c) observing gauges, meters, computer printouts, video monitors and products to ensure correct operation of machine and verify specified processing conditions
- (d) adjusting equipment, valves, pumps, controls and process equipment;
- (e) controlling the preparation, measuring and feeding of raw materials and processing agents into plant;
- (f) controlling process start-up and shut-down, troubleshooting and monitoring outside process equipment;
- (g) verifying equipment for malfunctions, carrying out routine operating tests and arranging for maintenance;
- (h) analyzing sample products, performing tests, recording data and writing production logs;

**Included occupations**

Examples of the occupations classified here:

- Ladle pourer
- Steel roller
- Metal heat treating operator
- Metal extrusion plant operator

**Excluded occupations**

- Blast furnace operator - 3135
- Central control caster - 3135
- Rolling mill control operator – 3135
- Metal coating machine-operator - 8122

**Notes****ISCO 88 Code(s)**

8121, 8122, 8123, 8124

**ISCO 08 Code****8122****Title EN****Metal finishing, plating and coating machine operators****Lead Statement**

Metal finishing-, plating- and coating-machine operators operate and monitor equipment which finishes, plates and coats metal articles or parts, in order to give them improved resistance to corrosion and abrasion, for decorative purposes, or to impart electrical or magnetic properties.

**Task statement**

Tasks include:

- (a) operating and monitoring equipment which cleans metal articles in preparation for electroplating, galvanising, enamelling or similar processes;
- (b) operating and monitoring electroplating equipment;
- (c) operating and monitoring hot-dip equipment used to coat iron and steel products;
- (d) operating and monitoring machines which automatically coat wire with non ferrous metal;
- (e) operating and monitoring equipment used to spray molten metal or other substances on metal products to provide a protective or decorative coating or to build up worn or damaged surfaces;
- (g) operating and monitoring equipment used to impart a rust-resistant finish to metal articles by treating them with chemicals and heating them;
- (i) checking proper thickness of plating using micrometers, callipers or other devices recording data and writing production logs;
- (j) preparing and mixing metalizing solutions according to formulas or specifications.

**Included occupations**

Examples of the occupations classified here:

- Metal coating machine-operator
- Metal finishing machine operator
- Metal plating machine operator

**Excluded occupations**

Metal processing control operator - 3135

**Notes****ISCO 88 Code(s)****8223**