Insulator (Heat & Frost)

Course Outline

2024

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Saskatchewan Apprenticeship and Trade Certification Commission

TRAINING PROFILE CHART

This Training Profile Chart represents Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training at the topic level.

Level One	Hours
Orientation and Safety	23
Insulation Accessories, Tools and Equipment	12
Blueprint Reading and Pattern Development	27
Insulation Materials, Applications and Safety	82
Asbestos Abatement	18
Trade Mathematics (Exceeds)	18
	180

Level Two	Hours
Safety, Noise Control and Exposure to Heat and Cold	6
Canvas on Piping, Ducts and Equipment	24
Polyvinyl Chloride Pipe Covering	18
Introduction to Metals	18
Miscellaneous Applications (*Includes Firestop Systems)	12
Blueprint Reading and Pattern Development	39
Trade Mathematics (Exceeds)	24
	180

Level Three	Hours
Safety, Tools and Codes (Exceeds)	6
Metal Fabrication	39
Equipment Layout	36
Pipe Rack Layout	39
Extruded Foam Pattern Development	24
Blueprint Reading and Pattern Development	48
Trade Mathematics (Exceeds)	48
	240

TECHNICAL TRAINING COURSE CONTENT

This chart outlines the model for Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training sequencing. For the harmonized level of training, a cross reference to the Red Seal Occupational Standard (RSOS) apprenticeship technical training sequencing, at the learning outcome level, is provided.

Sub-tasks listed are the minimum to be covered in a topic. Related sub-tasks not listed may be used as a reference and taught “in-context” in other topics.

Implementation for harmonization will take place progressively. However, Saskatchewan’s curriculum is staying as is; as an exception to Harmonization by implementing Fire stop Systems Installation in Level two rather than the Harmonized curriculum recommendation of implementing it in Level Three.

Level One — 6 weeks — 180 hours

Orientation and Safety — 23 hours

- apprenticeship overview
- OH&S regulations and safety
- Occupational Exposure Limits (OEL) and control measures
- safe work practices
- K and R factor principals
- pipe sizes

Insulation Accessories, Tools and Equipment — 12 hours

- mastics and cements
- mitres
- metal mesh, wire and bands
- hand and power tools
- material handling

Insulation Materials, Application and Safety — 82 hours

- insulation types, including fasteners
- fibreglass pipe covering
- fibreglass rigid and flex duct insulation
- acoustic insulation (fibreglass and mineral wool)
- Foamglass and Pittwrap
- mineral wool
- calcium silicate and ceramic fibres
- extruded foam plastic
- polystyrenes and polyurethanes

Blueprint Reading and Pattern Development — 27 hours

- lines, scale rulers, symbols
- pictorial and orthographic drawings
- divisions of blueprints and print assessment

Asbestos **18 hours**

- asbestos history and types
- methods of control, health effects and respirators
- site preparation, equipment and disposal
- regulations
- OH&S regulations and examinations

Trade Mathematics (Exceeds) **18 hours**

- whole numbers
- fractions and decimals
- conversions and percentages
- perimeters and area
- band spacing
- board feet

This section of training exceeds the minimum sequencing as set out in the Insulator (Heat & Frost) RSOS

Level Two — 6 weeks — 180 hours

Safety, Noise Control and Exposure to Heat and Cold — **6 hours**

- piping materials
- safety and noise control
- exposure to heat and cold

Canvas on Piping, Ducts and Equipment — **24 hours**

- application identification and surface preparation
- practical application
- stud welder use

Polyvinyl Chloride Pipe Covering — **18 hours**

- pipe covering application types
- surface preparation
- practical application

Introduction to Metals — **18 hours**

- line and circle division
- shop equipment and layout tools
- bevels
- equal and unequal tees
- end caps
- gore and butterfly elbows

Miscellaneous Applications — **12 hours**

- underground systems
- breeching
- expansion joints
- fireproofing/firestopping

Blueprint Reading and Pattern Development — **39 hours**

- orthographic drawings
- isometric drawings
- specifications and addendums
- commercial and industrial systems
- mechanical drawings and symbols

Trade Mathematics (Exceeds) — **24 hours**

- trade problems
- insulation on ducts and band spacing
- lags
- metal and canvas on ducts

This section of training exceeds the minimum sequencing as set out in the Insulator (Heat & Frost) RSOS

Level Three — 8 weeks — 240 hours

Safety, Tools and Codes (Exceeds) — **6 hours**

- regulations and building codes
- hand and power tool use and safety
- heat loss detection

Metal Fabrication — **39 hours**

- pattern development and line and circle division
- schedules of metals, fasteners and pipe sizes

Equipment Layout — **36 hours**

- spherical and elliptical heads
- box coverings
- concentric reducers
- eccentric reducers
- transitions

Pipe Rack Layout — **39 hours**

- bevels
- end caps
- equal and unequal tees
- gore and butterfly elbows
- laterals
- removable covers

Extruded Foam Pattern Development — **24 hours**

- extruded foam concepts
- elbows
- reducers and reducing elbows
- extruded foam plastics for pumps

Blueprint Reading and Pattern Development — **48 hours**

- blueprint reading and material take-offs
- commercial and industrial systems
- estimating

Trade Mathematics (Exceeds) — **48 hours**

- trade problems
- mathematical operations for insulation on ducts and band spacing
- mathematical operations for calculating lags
- mathematical operations for calculating metal and canvas on ducts

This section of training exceeds the minimum sequencing as set out in the Insulator (Heat & Frost) RSOS

INSULATOR (HEAT AND FROST)
TASK MATRIX CHART

This chart outlines the major work activities, tasks and sub-tasks from the 2018 Insulator (Heat and Frost) Red Seal Occupational Standard. Each sub-task details the corresponding essential skill and level of training where the content is covered. *

* Sub Tasks with numbers in the boxes is where the content will be delivered in training.

A - Performs routine occupational skills — 12%

Task A-1 Performs safety-related functions	**A-1.01** Uses personal protective equipment (PPE) and safety equipment — 1,2,3	**A-1.02** Maintains safe work environment — 1,2,3	
Task A-2 Uses and maintains tools and equipment	**A-2.01** Uses tools and equipment — 1,2,3	**A-2.02** Uses access equipment — 1,2,3	
Task A-3 Organizes work	**A-3.01** Performs task scheduling — 1	**A-3.02** Organizes materials on site — 1	
Task A-4 Uses communication and mentoring techniques	**A-4.01** Uses communication techniques — 1 (2, 3 In-Context)	**A-4.02** Uses mentoring techniques — 3	
Task A-5 Performs routine trade practices	**A-5.01** Performs measurements and calculations — 1, 2, 3	**A-5.02** Interprets specifications and drawings — 2, 3	**A-5.03** Prepares substrates — 1, 2

B - Performs industrial applications — 31%

Task B-6 Prepares for installation of insulation in industrial applications	B-6.01 Selects materials for industrial applications 1, 2, 3	B-6.02 Performs layout for industrial applications 1, 2, 3	
Task B-7 Insulates piping and fittings	B-7.01 Installs insulation on piping, fittings and hangers 1	B-7.02 Applies vapour barrier on piping and fittings 1	B-7.03 Installs cladding, jacketing and finishes on piping and fittings 3
Task B-8 Insulates tanks, vessels and equipment	B-8.01 Installs insulation on tanks, vessels and equipment 2	B-8.02 Applies vapour barrier on tanks, vessels and equipment 2	B-8.03 Installs cladding, jacketing and finishes on tanks, vessels and equipment 3

C - Performs commercial applications — 30%

Task C-9 Prepares for installation of insulation in commercial applications	C-9.01 Selects materials for commercial applications 1, 2	C-9.02 Performs layout for commercial applications 1, 2	
Task C-10 Insulates plumbing and mechanical piping systems	C-10.01 Installs insulation on plumbing and mechanical piping systems 1	C-10.02 Applies vapour barrier on insulated plumbing and mechanical piping systems 1	C-10.03 Installs cladding, jacketing and finishes on insulated plumbing and mechanical piping systems 2
Task C-11 Insulates mechanical ducting	C-11.01 Installs insulation on mechanical ducting 2	C-11.02 Applies vapour barrier on insulated mechanical ducting 2	C-11.03 Installs cladding, jacketing and finishes on insulated mechanical ducting 3

Task C-12 **Insulates mechanical equipment**	**C-12.01 Installs insulation on mechanical equipment** **2**	**C-12.02 Applies vapour barrier on insulated mechanical equipment** **2**	**C-12.03 Installs cladding, jacketing and finishes on insulated mechanical equipment** **3**

D - Performs applications common to industrial and commercial systems

12%

Task D-13 **Installs fire stop systems**	**D-13.01 Identifies approved fire stop system** **2**	**D-13.02 Applies fire stop materials to architectural, structural, mechanical and electrical components** **2**		
Task D-14 **Insulates for soundproofing**	**D-14.01 Insulates piping for soundproofing** **2**	**D-14.02 Insulates turbines, equipment and mechanical systems for soundproofing** **2**	**D-14.03 Fabricates acoustic panels** **(Not Common Core)** **2**	**D-14.04 Installs acoustic panels to ceilings and walls** **(Not Common Core)** **2**
Task D-15 **Installs removable covers**	**D-15.01 Fabricates removable covers** **3**	**D-15.02 Fastens removable covers** **3**		
Task D-16 **Installs underground insulating systems**	**D-16.01 Installs pipe insulation to underground systems** **2**	**D-16.02 Installs pour-in-place and spray-on insulation to underground systems** **2**		

E - Performs specialized applications

9%

Task E-17 **Sprays sealers, coatings and spray-on insulation**	**E-17.01 Protects surrounding work area for spraying** **2**	**E-17.02 Prepares material, equipment and substrate for spraying** **2**	**E-17.03 Installs reinforcing material for spraying** **2**	**E-17.04 Applies spray-on insulation, coatings and sealers** **2**
Task E-18 **Installs fireproofing**	**E-18.01 Applies fireproofing to architectural, structural, mechanical and electrical components** **2**	**E-18.02 Applies protective covering to fireproofing materials** **2**		
Task E-19 **Installs insulation for refractory systems**	**E-19.01 Applies insulation to refractory systems** **2**	**E-19.02 Installs reflective systems** **2**	**E-19.03 Installs cladding, jacketing and finishes to refractory systems** **2**	
Task E-20 **Installs insulation for cryogenic systems**	**E-20.01 Applies insulation to cryogenic systems** **2**	**E-20.02 Applies vapour barrier to insulated components of cryogenic systems** **2**	**E-20.03 Installs cladding, jacketing and finishes to cryogenic systems** **2**	
Task E-21 **Insulates for marine applications (Not Common Core)**	**E-21.01 Insulates bulkheads, deckheads and hulls** **(Not Common Core)** **2**	**E-21.02 Installs cladding, jacketing and finishes on marine applications** **(Not Common Core)** **2**		

F - Performs asbestos, lead and mould abatement — 6%

Task F-22 Prepares for asbestos abatement	F-22.01 Determines required personal protective equipment (PPE) for asbestos abatement — 1	F-22.02 Retrieves sample of asbestos for testing — 1	F-22.03 Determines scope of work — 1	F-22.04 Prepares site for removal and containment of asbestos — 1
	F-22.05 Builds temporary enclosure — 1			
Task F-23 Performs asbestos removal procedures	F-23.01 Removes asbestos — 1	F-23.02 Disposes of asbestos materials — 1	F-23.03 Performs decontamination of area and equipment — 1	
Task F-24 Performs maintenance and repair	F-24.01 Encapsulates asbestos — 1	F-24.02 Encloses asbestos — 1		
Task F-25 Performs lead abatement and mould remediation	F-25.01 Performs lead abatement — 1	F-25.02 Performs mould remediation — 1		

***The Insulator (Heat & Frost) Red Seal Occupational Standard (RSOS), describing the "full scope" of the trade, can be found at** www.red-seal.ca.

***For more detailed information on course content, please refer to the Insulator (Heat and Frost) Guide to Course Content at** www.saskapprenticeship.ca.