Insulator (Heat & Frost)

Guide to Course Content

2024

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Recognition:
To promote transparency and consistency, this document has been adapted from the 2018 Insulator (Heat & Frost) Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

STRUCTURE OF THE GUIDE TO COURSE CONTENT

To facilitate understanding of the occupation, this guide to course content contains the following sections:

Description of the Insulator (Heat & Frost) trade: an overview of the trade's duties and training requirements.

Essential Skills Summary: an overview of how each of the nine essential skills is applied in this trade.

Elements of harmonization of apprenticeship training: includes adoption of Red Seal trade name, number of levels of apprenticeship, total training hours (on-the-job and in-school) and consistent sequencing of technical training content. Saskatchewan stands as an exception by modeling the AB program with 3 levels of training and implementing *Fire stop Systems Installation* in Level two rather than the Harmonized curriculum recommendation of implementing it in Level Three.

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard detailing the essential skills and the level of training where the content is covered.

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.

Training Profile Chart: a chart which outlines the model for Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training.

Technical Training Course Content for the Insulator (Heat & Frost) trade: a chart which outlines the model for SATCC technical training sequencing.

Appendix A: Post Harmonization Training Profile Chart: a chart which outlines the finalized model for SATCC technical training sequencing with a cross reference to the Harmonized apprenticeship technical training sequencing, at the topic level.

DESCRIPTION OF THE INSULATOR (HEAT & FROST) TRADE

The Insulator (Heat & Frost) trade includes the preparation, fabrication, alteration, application, erection, assembling, moulding, spraying, pouring, mixing, hanging, adjusting, repairing, dismantling, removing, containing, reconditioning, maintaining, finishing and weatherproofing of thermal insulation and related materials on pipes, pipe fittings, valves, boilers, ducts, flues, tanks, vats, refrigeration piping and equipment, fire-stops, and other equipment.

Insulators (Heat & Frost) work with different kinds of insulating material to prevent or reduce the passage of heat, cold, vapour, moisture, sound or fire. They read and interpret drawings and specifications to determine insulation requirements, select the amount and type of insulation to be installed, and measure and cut insulating material to the required dimensions. They then apply, install, repair and maintain insulating material. Insulated surfaces may be finished with materials such as plastics, aluminum, galvanized steel and coated steel, stainless steel, canvas, mastic laminate or finishing cement. Insulators (Heat & Frost) also lay out and fabricate parts on-site or remove or seal off old insulation.

Types of insulating materials that may be used include calcium silicate, ceramic fibre, elastomeric foam, nano-like technology, mineral fibre, fibreglass, polyurethane, polystyrene and cellular glass. They may be used for systems such as plumbing, air-handling, exhaust, heating, cooling and refrigeration, for piping equipment, pressure vessels and storage tanks, as well as for walls, floors and ceilings of buildings, industrial complexes and ships.

Removing old insulating material such as asbestos, ceramic fibres, lead and mould is also part of the trade. Special training and licenses may be required to deal with these types of materials. Spraying insulating materials and installing fireproofing and fire stop systems are also specialized parts of the trade.

Insulators (Heat & Frost) are employed by governments, construction companies, insulation contractors and industrial plants, or may also be self-employed. They work on residential, industrial, commercial and institutional projects. Their work schedules depend on the type of work they are doing, ranging from regular work weeks, to shift work or irregular work hours. Schedules may depend on the availability of contracts, or inconvenience or health risks to adjacent workers or the public.

Insulators (Heat & Frost) work with a number of hand tools and power tools. They use personal protective equipment to protect themselves from workplace hazards. Also, they frequently use scaffolds, aerial lifts and ladders to help them accomplish their tasks. They can work indoors or outdoors, often in extreme temperatures. They may perform some of their tasks in confined spaces. Depending on the location of work, they may be required to travel.

The ability to be focused and responsible is a vital part of insulators' (Heat & Frost) work and safety. The work often requires the insulators (Heat & Frost) to spend most of the day on their feet, bending, kneeling, working at heights, climbing (scaffolds, ladders) and lifting. Insulators (Heat & Frost) must be able to use their body to brace large items and guide objects or materials into place. This requires them to have a good combination of motor co-ordination, and manual and finger dexterity.

Training Requirements: To graduate from each level of the apprenticeship program, an apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year. Total trade time required is 7200 hours and 4 years in the trade.

There are three levels of technical training delivered by the Insulator (Heat & Frost) Joint Training Committee in Regina, SK, SAIT and NAIT in AB:

Level One: 6 weeks
Level Two: 6 weeks
Level Three: 8 weeks

The information contained in this guide to course content details the technical training delivered for each level of apprenticeship. An apprentice spends approximately 15% of their apprenticeship term in a technical training institute learning the technical and theoretical aspects of the trade. The hours and percentages of technical and practical training may vary according to class needs and progress.

The content of the technical training components is subject to change without notice.

Entrance Requirements for Apprenticeship Training

Your grade twelve transcripts (with no modified classes) or GED 12 is your guarantee that you meet the educational entrance requirements for apprenticeship in Saskatchewan. In fact, employers prefer and recommend apprentices who have completed high school. This ensures the individual has all of the necessary skills required to successfully complete the apprenticeship program, and receive journeyperson certification.

Individuals with “modified” or “general” classes in math or science do not meet our entry requirements. These individuals are required to take an entrance assessment prescribed by the SATCC.

English is the language of instruction in all apprenticeship programs and is the common language for business in Saskatchewan. Before admission, all apprentices and/or “upgraders” must be able to understand and communicate in the English language. Applicants whose first language is not English must have a minimum Canadian Language Benchmark Assessment of six (CLB6).

Note: A CLB assessment is valid for a one-year period from date of issue.

Designated Trade Name	**Math Credit** at the Indicated Grade Level❶	**Science Credit** at Grade Level
Insulator (Heat & Frost)	Grade 10	Grade 10

❶ - (One of the following) WA – Workplace and Apprenticeship; or F – Foundations; or P – Pre-calculus, or a Math at the indicated grade level (Modified and General Math credits are not acceptable.).

*Applicants who have graduated in advance of 2015-2016, or who do not have access to the revised Science curricula will require a Science at the minimum grade level indicated by trade.

For information about high school curriculum, including Math and Science course names, please see: http://www.curriculum.gov.sk.ca/#

Individuals not meeting the entrance requirements will be subject to an assessment and any required training

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: https://www.canada.ca/en/employment-social-development/programs/essential-skills/profiles.html

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

READING

Insulators (Heat & Frost) use reading skills to read manuals and details of job specifications such as material lists. They read safety notices, work permits, safety regulations and emergency procedures in order to maintain a safe work environment.

DOCUMENT USE

Documents that insulators (Heat & Frost) work with include material lists, Workplace Hazardous Materials Information System (WHMIS) sheets and labels, instructions, work orders, reports, dispatch sheets and memos. They may also consult and interpret blueprints, specifications and permits, and complete logbooks.

WRITING

Insulators (Heat & Frost) write lists of materials and instructions. They may write hazard assessments, accident reports or keep work records for themselves and apprentices.

ORAL COMMUNICATION

Insulators (Heat & Frost) use oral communication skills during daily or weekly toolbox meetings with co-workers and supervisors to discuss job details. They also meet with workers from other trades to coordinate work. Oral communication skills are important when training apprentices.

NUMERACY

Insulators (Heat & Frost) use numeracy skills for measuring and cutting insulation, and determining thickness of insulation for pipes, ducts and equipment. They use formulas for calculating surface areas of frustrums, cones, and regular and irregular shapes to estimate required materials. They also use formulas to determine the thickness of insulation. They may need to convert between metric and imperial measurements.

THINKING

Problem solving skills are used by insulators (Heat & Frost) to anticipate and deal with situations such as materials not arriving as scheduled, unplanned shortages, or the wrong materials being delivered. Every job is different and often plans change requiring insulators (Heat & Frost) to adapt to the current requirements. Insulators (Heat & Frost) use their decision making skills when dealing with various issues such as where to make cuts so the material can be formed to the required shape and how to accurately cut the material to avoid waste.

DIGITAL TECHNOLOGY

Computers may be used by insulators (Heat & Frost) for tasks such as accessing specifications and blueprints (Computer Assisted Drawing [CAD]), receiving work orders and for the delivery of safety training. They use digital measuring equipment such as heat guns and thermal imaging cameras, and software such as energy loss assessment. Internet-based applications are also commonly used for research and documentation.

WORKING WITH OTHERS

Insulators (Heat & Frost) mostly work independently. They co-ordinate their work with other workers on-site including apprentices, journeypersons, supervisory personnel and workers from other trades depending on the size of the work site and the type of work.

CONTINUOUS LEARNING

There is an ongoing requirement to learn while working as an insulator (Heat & Frost). Work sites and companies may have different protocols. Applications, materials and processes are continually changing and skills need to be kept up-to-date.

ELEMENTS OF HARMONIZATION FOR APPRENTICESHIP TRAINING

At the request of industry, the Harmonization Initiative was launched in 2013 to *substantively align* apprenticeship systems across Canada by making training requirements more consistent in the Red Seal trades. Harmonization aims to improve the mobility of apprentices, support an increase in their completion rates and enable employers to access a larger pool of apprentices.

As part of this work, the Canadian Council of the Directors of Apprenticeship (CCDA) identified four main harmonization priorities in consultation with industry and training stakeholders:

1. Trade name

The official Red Seal name for this trade is Insulator (Heat & Frost).

2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for the Insulator (Heat & Frost) trade is four. However, Saskatchewan stands with Alberta as an exception by only offering three levels of technical training.

3. Total Training Hours during Apprenticeship Training

The total hours of training, including both on-the-job and in-school training for the Insulator (Heat & Frost) trade is 7200.

4. Consistent sequencing of training content (at each level) using the most recent Occupational Standard

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 one and Three.

White boxes are "Topics," grey boxes are "In-Context". In-Context means learning that has already taken place and is being applied to the applicable task. Learning outcomes for in-context topics are accomplished in other topics in that level.

Level 1	Level 2	Level 3
Safety-Related Functions	Safety-Related Functions	Safety-Related Functions
Tools and Equipment	Tools and Equipment	Tools and Equipment
Communication	Communication	Mentoring

Level 1	Level 2	Level 3
	Piping and Fitting Insulation (in-context with other industrial and commercial systems)	
		Mechanical Equipment Insulation (In-Context with Removable Covers)
Organizes Work		Organizes Work
Routine Trade Practices	Routine Trade Practices	Routine Trade Practices
Preparation for Industrial Applications	Preparation for Industrial Applications	Preparation for Industrial Applications
Piping and Fitting Insulation		Piping and Fitting Insulation
	Tank, Vessel and Equipment Insulation	Tank, Vessel and Equipment Insulation
Preparation for Commercial Applications	Preparation for Commercial Applications	Preparation for Commercial Applications
Plumbing and Mechanical Piping System Insulation	Plumbing and Mechanical Piping System Insulation	
	Mechanical Ducting Insulation	Mechanical Ducting Insulation
	Mechanical Equipment Insulation	Mechanical Equipment Insulation
Fire Stop System Installation	Fire Stop System Installation	
	Soundproofing Insulation	
		Removable Cover Installation (soft & hard cover)

Level 1	Level 2	Level 3
	Underground Insulating System Installation	
	Sealers, Coatings and Spray-on Insulation	
	Insulation Systems for Refractory Applications	
	Insulation Systems for Cryogenic Applications	
		Marine Applications
Preparation for Asbestos Abatement		
Asbestos Removal		
Asbestos - Maintenance and Repair		
Lead Abatement and Mould Remediation		

INSULATOR (HEAT AND FROST)
TASK MATRIX CHART

This chart outlines the major work activities, tasks and sub-tasks from the 2018 Insulator (Heat & 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**		

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

RSOS topics covered in this section of training:

A-1 Safety-related functions

A-1.01 Uses personal protective (PPE) and safety equipment
- PPE and safety equipment, their applications, maintenance and procedures for use
- Regulations pertaining to PPE and safety equipment

A-1.02 Maintains safe work environment
- Safe work practices
- Regulations pertaining to safety

Insulation Accessories, Tools and Equipment — 12 hours

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

RSOS topics covered in this section of training:

A-2 Uses and maintains tools and equipment

A-2.01 Uses tools and equipment
- tools and equipment, their applications, maintenance and procedures for use

A-2.02 Uses access equipment
- access equipment, their applications, maintenance and procedures for use

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications
- material selection for industrial applications

B-6.02 Performs layout for industrial applications
- layout procedures for industrial applications

B-7 Insulates piping and fittings
B-7.01 Installs insulation on piping, fittings and hangers
- procedures used to install insulation on piping, fittings and hangers

B-7.02 Applies vapour barriers on piping and fittings
- vapour barriers, their application and the procedures used for installation

C-9 Prepares for installation of insulation in commercial applications
C-9.01 Selects materials for commercial applications
- material selection for commercial applications

C-9.02 Performs layout for commercial applications
- procedures used to lay out materials for commercial applications

C-10 Insulates plumbing and mechanical piping systems
C-10.01 Installs insulation on plumbing and mechanical piping systems
- procedures used to install insulation on plumbing and mechanical piping systems

C-10.02 Applies vapour barriers on insulated plumbing and mechanical piping systems
- vapour barriers, their characteristics and applications and the procedures used for installation

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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

RSOS topics covered in this section of training:

B-6 Prepares for installation of insulation in industrial applications
B-6.01 Selects materials for industrial applications
- material selection for industrial applications

B-6.02 Performs layout for industrial applications
- layout procedures for industrial applications

B-7 Insulates piping and fittings
B-7.01 Installs insulation on piping, fittings and hangers
- procedures used to install insulation on piping, fittings and hangers

B-7.02 Applies vapour barriers on piping and fittings
- vapour barriers, their application and the procedures used for installation

C-9 Prepares for installation of insulation in commercial applications
9.01 Selects materials for commercial applications
- material selection for commercial applications

9.02 Performs layout for commercial applications
- procedures used to lay out materials for commercial applications

C-10 Insulates plumbing and mechanical piping systems
10.01 Installs insulation on plumbing and mechanical piping systems
- procedures used to install insulation on plumbing and mechanical piping systems

10.02 Applies vapour barriers on insulated plumbing and mechanical piping systems
- vapour barriers, their characteristics and applications and the procedures used for installation

Blueprint Reading and Pattern Development — 27 hours

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

RSOS topics covered in this section of training:

A-3 Organizes work

A-3.01 Performs task scheduling
- procedures to plan and schedule tasks

A-3.02 Organizes materials on site
- procedures used to organize materials on site

A-4 Uses communication and mentoring techniques

A-4.01 Uses communication techniques
- trade terminology
- effective communication practices

A-5 Performs routine trade practices

A-5.01 Performs measurements and calculations
- measurements and calculations

A-5.03 Prepares substrates
- substrates and the procedures used to prepare them for installation of insulation

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

RSOS topics covered in this section of training:

F-22 Prepares for asbestos abatement

F-22.01 Determines required personal protective equipment (PPE) for asbestos abatement
- PPE used for asbestos abatement, their applications and procedures for use
- regulations pertaining to asbestos abatement

F-22.02 Retrieves sample of asbestos for testing
- retrieving sample of asbestos
- regulations pertaining to asbestos abatement

F-22.03 Determines scope of work
- determining scope of work required for asbestos abatement
- regulations pertaining to asbestos abatement

F-22.04 Prepares site for removal and containment of asbestos
- preparing site for removal and containment of asbestos
- regulations pertaining to the removal and containment of asbestos

F-22.05 Builds temporary enclosure
- building temporary enclosure
- electrical safety pertaining to asbestos abatement
- regulations pertaining to the containment of asbestos

F-23 Performs asbestos removal procedures

F-23.01 Removes asbestos
- procedures used for removing asbestos
- regulations pertaining to the removal of asbestos

F-23.02 Disposes of asbestos materials

- procedures used for disposal of asbestos
- regulations pertaining to the disposal of asbestos

F-23.03 Performs decontamination of area and equipment

- procedures used for decontaminating area and equipment
- regulations pertaining to the decontamination of area and equipment

F-24 Performs maintenance and repair

F-24.01 Encapsulates asbestos

- procedures used to encapsulate asbestos
- regulations pertaining to the encapsulation of asbestos

F-24.02 Encloses asbestos

- procedures used to enclose asbestos
- regulations pertaining to the enclosure of asbestos

F-25 Performs lead abatement and mould remediation

F-25.01 Performs lead abatement

- lead, its health risks and abatement procedures

F-25.02 Performs mould remediation

- mould remediation, its health risks and procedures for remediation

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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

RSOS topics covered in this section of training:

A-5 Performs routine trade practices

A-5.01 Performs measurements and calculations
- measurements and calculations

A-5.02 Interprets specifications and drawings (Introduction)
- specifications, types of drawings and drawing components

A-5.03 Prepares substrates
- substrates and the procedures used to prepare them for installation of insulation

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications
- material selection for industrial applications

B-6.02 Performs layout for industrial applications
- layout procedures for industrial applications

E-19 Installs insulation for refractory systems

E-19.01 Applies insulation to refractory systems
- insulating refractory systems
- procedures used to install insulation on refractory systems

E-19.02 Installs reflective systems
- reflective systems, their applications and the procedures used to install them

E-19.03 Installs cladding, jacketing and finishes to refractory systems
- procedures used to install cladding, protective jacketing and finishes to refractory systems

Canvas on Piping, Ducts and Equipment — 24 hours

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

RSOS topics covered in this section of training:

B-8 Insulates tanks, vessels and equipment

B-8.01 Installs insulation on tanks, vessels and equipment
- insulating tanks, vessels and equipment
- procedures used to install insulation on tanks, vessels and equipment

B-8.02 Applies vapour barriers on tanks, vessels and equipment
- vapour barriers, their application and the procedures used for installation

C-9 Prepares for installation of insulation in commercial applications

C-9.01 Selects materials for commercial applications
- material selection for commercial applications

C-9.02 Performs layout for commercial applications
- procedures used to lay out materials for commercial applications

D-14 Insulates for soundproofing

D-14.01 Insulates piping for soundproofing
- insulating piping for soundproofing and their installation procedures

D-14.02 Insulates turbines, equipment and mechanical systems for soundproofing

- insulating turbines, equipment and mechanical systems for soundproofing and their installation procedures

D-14.03 Fabricates acoustic panels (Not Common Core)
- acoustic panels, their applications and the procedures used to fabricate them

D-14.04 Installs acoustic panels to ceilings and walls (Not Common Core)
- acoustic panels, their applications and installation procedures

E-17 Sprays sealers, coatings and spray-on insulation

E-17.01 Protects surrounding work area for spraying
- protecting work area for spraying sealers, coatings and spray-on insulation

E-17.02 Prepares material, equipment and substrate for spraying
- preparing material, equipment and substrate for spraying

E-17.03 Installs reinforcing material for spraying
- installing reinforcing materials for spraying

E-17.04 Applies spray-on insulation, coatings and sealers
- applying spray-on insulation, coatings and sealers

Polyvinyl Chloride Pipe Covering — 18 hours

- pipe covering application types
- surface preparation
- practical application

RSOS topics covered in this section of training:

C-10 Insulates plumbing and mechanical piping systems

C-10.03 Installs cladding, jacketing and finishes on insulated plumbing and mechanical piping systems
- cladding, jacketing and finishes, their purpose and applications
- procedures used to install cladding, jacketing and finishes on insulated plumbing and mechanical piping systems

C-11 Insulates mechanical ducting

C-11.01 Installs insulation on mechanical ducting
- installing insulation on mechanical ducting systems
- procedures used to install insulation on mechanical ducting systems

C-11.02 Applies vapour barrier on insulated mechanical ducting
- application of vapour barrier on insulated mechanical ducting

C-12 insulates mechanical equipment

C-12.01 Installs insulation on mechanical equipment
- installing insulation on mechanical equipment
- procedures used to install insulation on mechanical equipment

C-12.02 Applies vapour barriers on insulated mechanical equipment
- application of vapour barrier on insulated mechanical equipment

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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

RSOS topics covered in this section of training:

A-5 Performs routine trade practices

A-5.01 Performs measurements and calculations
- measurements and calculations

A-5.02 Interprets specifications and drawings
- specifications, types of drawings and drawing components

A-5.03 Prepares substrates
- substrates and the procedures used to prepare them for installation of insulation

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications
- material selection for industrial applications

B-6.02 Performs layout for industrial applications
- layout procedures for industrial applications

E-20 Installs insulation for cryogenic systems

E-20.01 Applies insulation to cryogenic systems
- cryogenic insulation systems and their applications
- procedures used to apply insulation to cryogenic systems

E-20.02 Applies vapour barrier to insulated components of cryogenic systems
- application of vapour barrier on insulated components of cryogenic systems
- procedures used to apply vapour barrier on insulated components of cryogenic systems

E-20.03 Installs cladding, jacketing and finishes to cryogenic systems
- procedures used to install cladding, protective jacketing and finishes to cryogenic systems

E-21 Insulates for marine applications (Not Common Core)

E-21.01 Insulates bulkheads, deckheads and hulls (Not Common Core)
- insulating bulkheads, deckheads and hulls

Miscellaneous Applications — 12 hours

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

RSOS topics covered in this section of training:

D-13 Installs fire stop system

D-13.01 Identifies approved fire stop system
- fire stop systems for architectural, structural, mechanical and electrical components

D-13.02 Applies fire stop materials to architectural, structural, mechanical and electrical components
- applying fire stop materials to architectural, structural, mechanical, and electrical components

D-16 Installs underground insulating systems

D-16.01 Installs pipe insulation to underground systems
- insulating piping in underground systems and the installation procedures

D-16.02 Installs pour-in-place and spray-on insulation to underground systems
- pour-in-place insulation for underground systems and the procedures used for its installation

E-18 Installs fireproofing

E-18.01 Applies fireproofing to architectural, structural, mechanical and electrical components
- applying fireproofing to architectural, structural, mechanical and electrical components

E-18.02 Applies protective covering to fireproofing materials
- protective fireproofing materials

Blueprint Reading and Pattern Development — 39 hours

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

RSOS topics covered in this section of training:

B-8 Insulates tanks, vessels and equipment
B-8.01 Installs insulation on tanks, vessels and equipment
- insulating tanks, vessels and equipment
- procedures used to install insulation on tanks, vessels and equipment

B-8.02 Applies vapour barriers on tanks, vessels and equipment
- vapour barriers, their application and the procedures used for installation

C-9 Prepares for installation of insulation in commercial applications
C-9.01 Selects materials for commercial applications
- material selection for commercial applications

C-9.02 Performs layout for commercial applications
- procedures used to lay out materials for commercial applications

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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 Two topics from the RSOS taught in context:

A-2 Uses and maintains tools and equipment
A-4 Uses communication and mentoring techniques
B-7 Insulates piping and fittings

For details regarding the In-Context topics, see page 27

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

RSOS topics covered in this section of training:

A-1 Safety-related functions

A-1.01 Uses personal protective (PPE) and safety equipment

- PPE and safety equipment, their applications, maintenance and procedures for use
- Regulations pertaining to PPE and safety equipment

A-1.02 Maintains safe work environment

- Safe work practices
- Regulations pertaining to safety, tools and equipment

A-4 Uses communication and mentoring techniques

A-4.02 Uses Mentoring Techniques

- Strategies for learning skills in the workplace
- Strategies for teaching workplace skills

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications

- material selection for industrial applications

B-6.02 Performs layout for industrial applications

- layout procedures for industrial applications

Metal Fabrication — 39 hours

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

RSOS topics covered in this section of training:

A-5 Performs routine trade practices

A-5.01 Performs measurements and calculations

- measurements and calculations

A-5.02 Interprets specifications and drawings

- specifications, types of drawings and drawing components

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications

- material selection for industrial applications

B-6.02 Performs layout for industrial applications

- layout procedures for industrial applications

E-21 Insulates for marine applications (Not Common Core)

E-21.01 Insulates bulkheads, deckheads, and hulls (Not Common Core)

- procedures used to install cladding, protective jacketing and finishes on marine applications

Equipment Layout — 36 hours

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

RSOS topics covered in this section of training:

B-6 Prepares for installation of insulation in industrial applications
B-6.01 Selects materials for industrial applications
- material selection for industrial applications

B-6.02 Performs layout for industrial applications
- layout procedures for industrial applications

Pipe Rack Layout — 39 hours

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

RSOS topics covered in this section of training:

B-8 Insulates tanks, vessels and equipment
B-8.03 Installs cladding, jacketing and finishes on tanks, vessels and equipment
- cladding, jacketing and finishes, their purpose and application
- procedures to install components on tanks, vessels and equipment

C-11 Insulates mechanical ducting
11.03 Installs cladding, jacketing and finishes on insulated mechanical ducting
- cladding, jacketing and finishes, their characteristics and applications
- procedures used to install cladding, jacketing and finishes on insulated mechanical ducting systems

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Extruded Foam Pattern Development — 24 hours

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

RSOS topics covered in this section of training:

B-7 Insulates piping and fittings
B-7.03 Installs cladding, jacketing and finishes on piping and fittings
- cladding, jacketing and finishes, their purpose and application
- procedures used to install cladding, jacketing and finishes on insulated piping and fittings

B-8 Insulates tanks, vessels and equipment
8.03 Installs cladding, jacketing and finishes on tanks, vessels and equipment
- cladding, jacketing and finishes, their purpose and application
- procedures to install components on tanks, vessels and equipment

C-12 Insulates mechanical equipment
12.03 Installs cladding, jacketing and finishes on insulated mechanical equipment
- cladding, jacketing and finishes, their characteristics and applications
- procedures used to install cladding, jacketing and finishes on insulated mechanical equipment

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Blueprint Reading and Pattern Development — 48 hours

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

RSOS topics covered in this section of training:

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications

- material selection for industrial applications

B-6.02 Performs layout for industrial applications

- layout procedures for industrial applications

D-15 Installs removable covers

15.01 Fabricates removable covers

- removable covers, their applications and the procedures used to fabricate them

15.02 Fastens removable covers

- removable covers, their applications and the procedures used to fasten them

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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.

Level Three topics from the RSOS taught in context:

A-2 Uses and maintains tools and equipment

For details regarding the In-Context Topics, see page 27

IN-CONTEXT TOPICS

In-Context means learning that has already taken place and is being applied to the applicable task. Learning outcomes for in context topics are accomplished in other topics in that level.

A-1 Safety-related functions

A-1.01 Uses personal protective (PPE) and safety equipment

- PPE and safety equipment, their applications, maintenance and procedures for use
- Regulations pertaining to PPE and safety equipment

A-1.02 Maintains safe work environment

- procedures used to organize materials on site

A-2 Uses and maintains tools and equipment

A-2.01 Tools and equipment

- tools and equipment, their applications, maintenance and procedures for use

A-2.02 Uses access equipment

- access equipment, their applications, maintenance and procedures for use

A-4 Uses communication and mentoring techniques

A-4.01 Uses Communication Techniques

- trade terminology
- effective communication practices

A-4.02 Uses mentoring techniques

- strategies for learning in the workplace
- strategies for teaching workplace skills

B-6 Prepares for installation of insulation in industrial applications

B-6.01 Selects materials for industrial applications

- material selection for industrial applications

B-6.02 Performs layout for industrial applications

- layout procedures for industrial applications

B-7 Insulates piping and fittings

B-7.01 Installs insulation on piping, fittings and hangers

- procedures used to install insulation on piping, fittings and hangers

B-7.02 Applies vapour barriers on piping and fittings

- vapour barriers, their application and the procedures used for installation

C-9 Prepares for installation of insulation in commercial applications

C-9.01 Selects materials for commercial applications

- material selection for commercial applications

C-9.02 Performs layout for commercial applications

- procedures used to lay out materials for commercial applications

APPENDIX A: POST HARMONIZATION TRAINING PROFILE CHART

This chart which outlines the finalized model for SATCC technical training sequencing with a cross reference to the Harmonized apprenticeship technical training sequencing, at the topic level.

Implementation for harmonization took place progressively.

SATCC Level One	Hours	Pan-Canadian Harmonized Level One
		Organizes Work (In-Context)
Insulation Accessories, Tools and Equipment	23	Tools and Equipment
Orientation and Safety	12	Safety Related Functions
Insulation Materials, Application and Safety	82	Organizes Work
		Communication
		Routine Trade Practices
		Preparation for Industrial Applications
		Piping and Fitting Insulation
		Preparation for Commercial Applications
Blueprint Reading and Pattern Development	27	Plumbing and Mechanical Piping System Insulation
Asbestos Abatement	18	Preparation for Asbestos Abatement
		Asbestos Removal
		Asbestos - Maintenance and Repair
		Lead Abatement and Mould Remediation
Trade Mathematics (Exceeds)	18	
	180	

SATCC Level Two	Hours	Pan-Canadian Harmonized Level Two
		Tools and Equipment (In-Context)
		Safety Related Functions (In-Context)
		Communication (In-Context)
		Piping and Fitting Insulation (In-Context)
Introduction to Metals	18	Routine Trade Practices
		Preparation for Industrial Applications
		Preparation for installation of insulation in commercial applications
Blueprint Reading and Pattern Development	74	Preparation for installation of insulation in commercial applications
		Plumbing Systems and Mechanical Piping Installation
		Mechanical Ducting Insulation
		Mechanical Equipment Insulation
Canvas on Piping, Ducts and Equipment	24	Preparation for installation of insulation in commercial applications
		Plumbing Systems and Mechanical Piping Installation
		Mechanical Ducting Insulation
		Mechanical Equipment Insulation
Poly Chloride Pipe Covering	18	Plumbing Systems and Mechanical Piping Installation
		Protective Cladding Insulation
Miscellaneous Applications (includes Firestop Systems)	12	(*Harmonized Level 4*)
Safety, Noise Control	6	Removable Cover Installation
		Soundproofing Insulation
		Tank Vessel and Equipment Insulation
		Removable Cover Installation
Trade Mathematics (Exceeds)	28	
	180	

*The board stands as an exception by teaching Firestop Systems Installation in level Two, rather than in Level 3.

SATCC Level Three	Hours	Pan-Canadian Harmonized Level Three
		Tools and Equipment
		Safety Related Functions
		Communication (3 only)
Metal Fabrication	39	Preparation for Industrial Applications
		Routine Trade Practices (Harmonized Level 3 & 4)
		Preparation for Industrial Applications (Harmonized Level 3 &4)
Blueprint Reading and Pattern Development	48	Removable Cover Installation (hard cover) (Harmonized Level 3 & 4)
Equipment Layout	36	Piping and Fitting Insulation (Harmonized Level 3 & 4)
Pipe Rack Layout	39	Mechanical Ducting Insulation (Harmonized Level 3 & 4)
		Mechanical Equipment Insulation (Harmonized Level 3 & 4)
Extruded Foam Pattern Development	24	Tank Vessel and Equipment Insulation
Trade Mathematics(Exceeds)	48	
Safety, Tools and Codes (Exceeds)	6	
	240	

Exceed Topics

Throughout this guide to course content there are topics which exceed the minimum scope of work as set out in the Insulator (Heat & Frost) RSOS. Industry in Saskatchewan has deemed certain topics to fall within the scope of work of the Insulator trade in Saskatchewan and therefore require technical training to cover these topics.