Insulator (Heat & Frost)
A Guide to Course Content

Insulators (Heat & Frost) maintain and apply thermal insulation to commercial and industrial structures and equipment.

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 at least 4 years in the trade.

There are three levels of technical training delivered by the Heat and Frost Insulator Training Committee in Regina and by NAIT in Edmonton, Alberta:

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

The information contained in this pamphlet serves as a guide for employers and apprentices. The pamphlet briefly summarizes the training delivered at each level of apprenticeship training. An apprentice spends approximately 15% of the 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.

Level One - 6 weeks

Orientation and Safety
- 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 Materials, Application and Safety
- 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

Insulation Accessories, Tools and Equipment
- mastics and cements
- mitres
- metal mesh, wire and bands
- hand and power tools
- material handling

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

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

Blueprint Reading and Pattern Development
- lines, scale rulers, symbols
- pictorial and orthographic drawings
- divisions of blueprints and print assessment

Level Two - 6 weeks

Safety, Noise Control and Exposure to Heat and Cold
- safety and noise control
- exposure to heat and cold

Canvas on Piping, Ducts and Equipment
- application identification and surface preparation
- practical application
- stud welder use

Polyvinyl Chloride Pipe Covering
- pipe covering application types
- surface preparation
- practical application

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

Miscellaneous Applications
- underground systems
- breechings
- expansion joints
- fireproofing/firestopping

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

Blueprint Reading and Pattern Development
- orthographic drawings
- isometric drawings
- specifications and addendums
- commercial and industrial systems
- mechanical drawings and symbols

Level Three - 8 weeks

Safety, Tools and Codes
- regulations and building codes
- hand and power tool use and safety
- heat loss detection

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

Equipment Layout

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

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

Extruded Foam Pattern Development
- extruded foam concepts
- elbows
- reducers and reducing elbows
- extruded foam plastics for pumps

Trade Mathematics
- 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

Blueprint Reading and Pattern Development
- blueprint reading and material take-offs
- commercial and industrial systems
- estimating