

ORIENTATION

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Explain what insulation is and the basic uses of insulation.
2. Understand the history of insulation.
3. Identify some tool requirements and their uses.
4. Identify some systems that require insulation.
5. Identify who designs the required insulation for different systems.
6. Explain what an estimate is used for in a project.
7. Identify some of the types of insulation materials used.
8. Explain the difference between commercial and industrial plants.
9. Explain who subcontractors and general contractors are.
10. Explain who owners are.
11. Explain what energy conservation is.

Note to the Instructor

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead projector and screen
Whiteboard / Chalkboard
Appropriate Personal
Protective Equipment

Materials

Trainee Task Module
Performance Profile Sheets
Module Examinations
Transparencies
Markers / Chalk
Pencils / Paper

HOW TO USE THIS INSTRUCTOR'S GUIDE

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Introduction/Overview
Classroom, and/or Demonstration, and/or Laboratory
Class Break
Classroom, and/or Demonstration, and/or Laboratory
Summary

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Laboratory: Instructors will facilitate all laboratory activities, coach trainees as they practice the procedures, monitor trainee progress, and provide feedback. The instructor will make sure that safety rules are followed at all times and that protective equipment is worn.

NCCER Standardized Craft Training Programs

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MODULE OVERVIEW

This module introduces the insulating trainee to the basic requirements for a career as an insulator. The intended audience for this module includes all insulating trainees.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Task Module

Approximately 5 hours or two sessions of training time is suggested to cover *Orientation*. The training class session is a suggested 2-1/2 hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence—Two 2¹/₂-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Introduction	1.0 – 5.0
2	Typical Insulation Systems Performance Profile / Module Examination	5.0 – 7.0

TRANSPARENCY 1-2
TASK MODULE 19101, ORIENTATION

PERFORMANCE PROFILE TASKS

- 1. Identify 10 tools needed for insulation work.**
- 2. Identify the assorted types of insulation materials on display.**

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Explain how a construction team works together to complete a project.
2. Explain the work an insulation contractor performs.
3. Explain what happens when poor communications between trades takes place.
4. Identify some of the specific areas that would make insulation application difficult.
5. Identify what is important upon the first day of assignment on the job site.

Note to the Instructor

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Required Equipment and Materials

The following are required for instruction using this module:

Equipment

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Whiteboard / Chalkboard

Materials

Trainee Task Module
Markers / Chalk
Transparencies
Paper / Pencils
Performance Profile Sheets
Module Examinations

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Classroom, and/or Demonstration, and/or Laboratory
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MODULE OVERVIEW

This module introduces the insulating trainee to the methods and procedures for developing trade relations. The intended audience for this module includes all insulating trainees.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Module 19101

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Task Module

Approximately 7.5 hours or three sessions of training time is suggested to cover *Trade Relations*. The training class session is a suggested 2-1/2 hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Three 2¹/₂-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Introduction; Contractor Relationships; Types Of Contracts	1.0 – 3.0
2	Mechanical Contractor; Sub-Subcontractors	4.0 – 5.0
3	Other Subcontractors; General Contractor Performance Profile / Module Examination	6.0 – 7.0

PERFORMANCE PROFILE TASKS

- 1. Break into groups and conduct a typical scheduling meeting for a project with each of the trainees assuming different roles.**
- 2. Take turns being a contractor and an inspector on a project.**

TOOLS OF THE TRADE

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Identify specific tools required in the insulation trade.
2. Choose the correct tool for the specific application.
3. Demonstrate the procedures for the care of personal hand tools.
4. Demonstrate the proper usage of personal hand tools.
5. Explain the general safety rules for hand tools.
6. Explain how and where personal tools should be kept when not in use at the job site.

NOTE TO THE INSTRUCTOR

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead projector and screen
Whiteboard / Chalkboard
Appropriate Personal Protective Equipment
Hand tools needed for demonstration
Power tools needed for demonstration

Materials

Trainee Task Module
Markers / Chalk
Transparencies
Paper / Pencils
Module Examination
Performance Profile Sheets

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Introduction/Overview
Classroom, and/or Demonstration, and/or Laboratory
Class Break
Classroom, and/or Demonstration, and/or Laboratory
Summary

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MODULE OVERVIEW

This module introduces the insulating trainee to the required tools of the trade and their proper use. The intended audience for this module includes all insulating trainees.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Modules 19101 and 19102.

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Task Module

Approximately 7½ hours or 3 sessions of training time is suggested to cover *Tools of the Trade*. The training class session is a suggested 2½ hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Three 2½-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Introduction; Basic Tools; Additional Tools	1.0 – 5.0
2	Power Tools And Shop Tools; Safety Tools	6.0 – 7.0
3	Performance Profile / Module Examination	

PERFORMANCE PROFILE TASKS

- 1. Describe appropriate personal protective equipment and demonstrate the safety procedures for using power tools.**
- 2. Identify all tools required and demonstrate a knowledge of the use of each tool.**

MATERIAL HANDLING, STORAGE, AND DISTRIBUTION

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Explain how to receive materials.
2. Explain how to store materials properly.
3. Separate materials for easy usage when needed.
4. Explain why certain materials should be stored inside.
5. Describe where excess materials should be placed.
6. Describe what happens to boxes of materials when not kept dry.

NOTE TO THE INSTRUCTOR

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead projector and screen
Whiteboard / Chalkboard
Appropriate Personal Protective Equipment
Samples of materials to be stacked

Materials

Trainee Task Module
Markers / Chalk
Transparencies
Paper / Pencils
Performance Profile Sheets
Module Examinations

HOW TO USE THIS INSTRUCTOR'S GUIDE

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Introduction/Overview
Classroom, and/or Demonstration, and/or Laboratory
Class Break
Classroom, and/or Demonstration, and/or Laboratory
Summary

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MODULE OVERVIEW

This module introduces the insulating trainee to the methods and procedures for proper materials handling, storage, and distribution.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Modules 19101 through 19103.

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Task

Approximately 2¹/₂ hours or one session of training time is suggested to cover *Material Handling, Storage, and Distribution*. The training class session is a suggested 2¹/₂ hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — One 2¹/₂-Hour Session

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section
1	Introduction; Delivery; Stacking; Storage; Moving Material; Cleanup And Usage Performance Profile / Module Examination	1.0-7.0

TRANSPARENCY 4-2

TASK MODULE 19104

MATERIAL HANDLING, STORAGE, AND DISTRIBUTION

PERFORMANCE PROFILE TASKS

- 1. Identify materials provided by your instructor and describe proper storage procedures.**
- 2. Stack and cover insulation materials.**

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CHARACTERISTICS OF PIPE

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Identify the various types of pipe.
2. Understand why different pipe is used for certain services.
3. Understand the relationship between pipe size and sizes of insulation.
4. Understand what heat traced pipe is.
5. Understand thermal expansion for hot systems.
6. Describe the various accessories in pipe systems.
7. Demonstrate how to achieve greater insulation thickness using different sizes of piping insulation.
8. Convert outside diameter (O.D.) and inside diameter (I.D.) measurements between copper and iron piping.

NOTE TO THE INSTRUCTOR

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead projector and screen
Appropriate Personal Protective Equipment
Whiteboard / Chalkboard
Assorted samples of pipe, copper, and iron
Assorted samples of fittings
Assorted samples of heat tracing

Materials

Trainee Task Module
Transparencies
Markers / Chalk
Paper / Pencils
Performance Profile Sheets
Module Examination

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Classroom, and/or Demonstration, and/or Laboratory
Class Break
Classroom, and/or Demonstration, and/or Laboratory
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MODULE OVERVIEW

This module introduces the insulating trainee to the identification of types of pipe, sizes, and uses of pipe and insulation thickness. The intended audience for this module is all insulating trainees.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Modules 19101 through 19104.

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time for This Task Module

Approximately 5 hours or two sessions of training time is suggested to cover *Characteristics of Pipe*. The training class session is a suggested 2-1/2 hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Two 2½-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Steel Pipe	1.0 – 3.0
2	Copper Tubing, Plastic Pipe, And Cast Iron Pipe Performance Profile / Module Examination	4.0 – 7.0

PERFORMANCE PROFILE TASKS

- 1. Identify iron pipe, copper tubing, and stainless steel tubing.**
- 2. Choose a piece of pipe insulation which will fit both a copper tubing size and the corresponding iron pipe size.**
- 3. Properly nest two sizes of pipe insulation.**

INSTALLING FIBERGLASS PIPE INSULATION

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Describe the basic characteristics of fiberglass pipe insulation.
2. Identify and use the proper tools for application.
3. Properly install ASJ jacket and butt strips with or without the use of staples.
4. Make required measurements on pipe for the proper installation of pipe insulation and jacket.
5. Install fiberglass insulation on pipe at contact-type hangers.
6. Make proper cuts in fiberglass pipe insulation for installation on pipe where several cut-outs are required.
7. Trim out insulation for pipe couplings, welds, and other obstructions.
8. Install rigid inserts at pipe hangers when fiberglass pipe insulation is being installed on pipe.

NOTE TO THE INSTRUCTOR

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead Projector and Screen
Appropriate Personal Protective Equipment
Whiteboard / Chalkboard
Sample of fiberglass pipe insulation
Piping mock-up
Required trainee tools

Materials

Trainee Task Module
Transparencies
Markers / Chalk
Paper / Pencils
Performance Profile Sheets
Module Examination

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MODULE OVERVIEW

This module introduces the insulating trainee to the methods and procedures for installing fiberglass pipe insulation.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Modules 19101 through 19105.

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time For This Task Module

Approximately 30 hours or twelve sessions of training time is suggested to cover *Installing Fiberglass Pipe Insulation*. The training class session is a suggested 2½ hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods for this module are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Twelve 2½-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Introduction; Sizing; ASJ Jacketing	1.0.0 – 3.0.0
2	Handling And Storing; Tools; Piping Terminology	4.0.0 – 6.0.0
3	Installing Fiberglass Pipe Insulation; Applying Self-Seal Lap ASJ Jacketing; Applying Ells And Tees; Cutting Techniques	6.0.0 – 8.0.0
4	Installing Fiberglass Pipe Insulation; Cutting Techniques	7.0.0
5	Butt Strip And Jacketing Installation	9.0.0
6	Applying With Staples And Vapor Sealing; Applying Without Jacketing	10.0.0
7	Trimming Insulation	12.0.0
8	Insulation At Pipe Hangers	13.0.0
9	Insulation At Pipe Hangers	13.0.0
10	Insulation At A Welded Type Saddle	13.0.0
11	Insulation At Tees; Guidelines For A Quality Job	14.0.0 – 15.0.0
12	Performance Profile Exam / Module Examination	

PERFORMANCE PROFILE TASKS

- 1. Install fiberglass pipe insulation on straight run pipe with ASJ and SSL using butt strips on circumferential joints.**
- 2. Install fiberglass pipe insulation at an outside pipe hanger using rigid inserts.**
- 3. Install a tee.**
- 4. Saddle a smaller size pipe insulation to a larger size.**

INSULATING PIPE FITTINGS, VALVES, AND FLANGES

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Identify different types of pipe fittings, valves, and flanges and explain the insulation requirements for each.
2. Cut and install mitered segments of insulation to pipe elbows.
3. Cut insulation for application to flanged valves.
4. Install insulation on pipe flanges.
5. Cut and install plug 90 degree ells.

Note to the Instructor

Before teaching this Task Module, you should review the details in this Instructor's Guide for Equipment and Materials, Testing, and the suggested Teaching Sequence. Be sure to allow ample time to prepare your own training plan or lesson plan and to gather all required equipment and materials.

Required Equipment and Materials

The following are required for instruction using this module:

Equipment

Overhead projector and screen
Appropriate Personal Protective Equipment
Piping fittings mock-up
Insulation for fittings
Whiteboard / chalkboard
Trainee tools

Materials

Trainee Task Module
Transparencies
Markers / chalk
Pencils / paper
Module Examination
Performance Profile Sheets

HOW TO USE THIS INSTRUCTOR'S GUIDE

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Introduction/Overview
Classroom, and/or Demonstration, and/or Laboratory
Class Break
Classroom, and/or Demonstration, and/or Laboratory
Summary

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MODULE OVERVIEW

This module introduces the insulating trainee to the methods and procedures for insulating pipe fittings, valves, and flanges.

Prerequisites

Please see the Course Map. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following modules:

Core Curricula; Insulating Level 1, Modules 19101 through 19106

Safety Considerations

Ensure that the trainees are equipped with Appropriate Personal Protective Equipment.

Teaching Time For This Task Module

Approximately 40 hours or sixteen sessions of training time is suggested to cover *Insulating Pipe Fittings, Valves, and Flanges*. The training class session is a suggested 2½ hour time period, which includes one break. **You will need to adjust the time required for hands-on activities and testing based on your class size and resources.** All time periods are suggested, and you will need to adapt the suggested lesson plan to meet your local conditions.

Suggested Teaching Sequence — Sixteen 2½-Hour Sessions

Adjust your class times based on class size and resources.

Session	Topic	Trainee Module Section(s)
1	Introduction; Types Of Fittings; Fitting Materials	1.0.0 – 3.0.0
2	Tools Needed To Insulate; Copper Fitting	3.0.0 – 3.2.0
3	Insulating Pipe Fittings; PVC's; Fitting Covers	3.2.0 – 3.2.3
4	Mitered Segment Fitting Covers; Miter Charts; Fitting Saw	3.2.3 – 3.2.4
5	Cutting Miters By Hand And With A Fitting Saw	3.2.4 – 3.2.5
6	Installing Miters On 90 Degree Ells; Applying Miter Finishes	3.2.5 – 3.2.6
7	Mitered Pipe Section (Stove Pipe) Fitting Cover; Miter Box	3.2.6 – 3.2.7
8	Cutting And Installing Stove Pipe	3.2.6 – 3.2.7
9	Built-Up Fitting Covers; Insulation Cement	3.3.0 – 3.3.1
10	Insulating Tees	3.3.1 – 3.3.2
11	Insulating Tees; Various Types Of Finishes	3.3.1 – 3.3.2
12	Insulating Reducers And Line Flanges	3.3.2 – 3.4.1
13	Insulating Flanged Valves	3.4.1
14	Summary — Fabricate, Install, Insulate And Finish A Flanged Valve	
15	Performance Profile Examination	

TRANSPARENCY 7-2

TASK MODULE 19107, INSULATING PIPE FITTINGS, VALVES, AND FLANGES

PERFORMANCE PROFILE TASKS

- 1. Lay out by hand a 6 x 1-1/2 mitered elbow and apply to the piping mock up.**
- 2. Lay out by hand a tee and install.**
- 3. Lay out and install a flanged valve for a cold service application.**
- 4. Insulate a screwed fitting with insulation cement.**