



ARPM Training Academy

ARPM

SKILLS COURSES



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NONMOLDING OPERATIONS

ARPM-1001 Introduction to Nonmolding Operations

Course Description

Nonmolding operations are manufacturing steps that occur before or after a rubber product is molded. As an operator, you might be required to perform some of these steps. Understanding nonmolding operations and how they are performed will give you a better understanding of the rubber molding process.

By the end of this module, you will be able to

- Define nonmolding operations
- Contrast molding operations with nonmolding operations
- Understand where nonmolding operations fit into the molding process
- List different types of nonmolding operations

Estimated completion time (hours): 0.8

ARPM-1002 Preparing Inserts

Course Description

Some rubber products include inserts, which are pieces of metal or other materials that support or give shape to the product. Various preparation steps, such as cleaning, help to ensure the rubber successfully bonds with the insert during molding.

By the end of this module, you will be able to

- Define insert
- List types of inserts
- Understand the process for preparing inserts
- Describe methods for quality testing prepared inserts

Estimated completion time (hours): 1.4

ARPM-1003 Molding Products with Inserts

Course Description

This module introduces you to the process of molding products with inserts. Several different factors, including the weather, can impact the success of the molding process and whether the products you produce meet the customer's requirements.

By the end of this module, you will be able to

- List the process for molding a product with an insert
- Understand the dangers of misplaced inserts
- List key factors for successfully bonding rubber to an insert
- Describe what happens when the temperature is incorrect during bonding
- Define the terms bond line and bond failure analysis
- Understand the difference between destructive and nondestructive testing

Estimated completion time (hours): 0.9

ARPM-1004 Preparing Rubber for Molding

Course Description

As an operator, you may be responsible for preparing rubber for molding. These preparation steps set the stage for molding quality products that meet the customer's requirements.

By the end of this module, you will be able to

- Explain the importance of preparing rubber for molding
- Define the term preform
- Describe different methods of preparing rubber for molding
- Explain the purpose of weighing preforms
- Explain the purpose of anti-tack solution

Estimated completion time (hours): 0.9

ARPM-1005 Deflashing

Course Description

Flash is a normal occurrence on a molded product, but it can sometimes interfere with the functionality of the product by preventing the products from mating with other products or sealing properly. Deflashing removes the flash and helps to ensure that the product works as designed.

By the end of this module, you will be able to

- Describe the purpose of deflashing
- Define flash characteristics
- Describe several different methods of deflashing

Estimated completion time (hours): 0.9

ARPM-1006 Performing Secondary Operations

Course Description

The rubber molding process typically includes secondary operations, which transform the product or prepare it for use by the customer.

By the end of this module, you will be able to

- Explain why secondary operations are performed
- Define common secondary operations
- Describe assembly operations performed on molded products
- Describe ways that products might be packaged to send to the customer

Estimated completion time (hours): 1.0

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QUALITY IN RUBBER MANUFACTURING

ARPM-1007 Quality in Rubber Manufacturing

Course Description

How do you feel about the hassles of returning or exchanging a defective product? It can be annoying, frustrating, and time-consuming. Customers who buy rubber products feel the same way. Rubber manufacturers implement quality systems to identify and prevent quality problems.

By the end of this module, you will be able to

- Define a quality product
- List examples of the cost of poor-quality
- Calculate the scrap percentage
- Describe your role in your company's quality processes
- List different testing methods used to test products
- Describe the purpose of a run chart
- Define the term containment
- Define nondestructive and destructive testing
- Understand the purpose of work instructions
- Describe typical defects found in rubber products and their causes
- Describe different methods used for quality management

Estimated completion time (hours): 2.1

ARPM-1008 Durometers

Course Description

One important property of a rubber product is hardness. If the hardness doesn't meet the requirements defined by the customer or the product engineers, the product might not work as expected. A durometer is a measuring tool used to measure the hardness of products made from rubber, plastic, gel, and other materials.

By the end of this module, you will be able to

- Define hardness
- List the parts of a digital durometer
- List the parts of an analog durometer
- Describe the purpose of a durometer test stand
- Explain how durometers work
- Recognize different indenter shapes
- Describe Shore hardness scales and different types of durometers
- List the steps for measuring hardness with a digital durometer
- List the steps for measuring hardness with an analog durometer

Estimated completion time (hours): 1.2

ARPM-1009 Pyrometers

Course Description

To produce high-quality rubber products, the temperature of the mold cannot be too high or too low. A pyrometer enables you to quickly and easily measure the temperature of the mold or other objects.

By the end of this module, you will be able to

- Explain the purpose of a pyrometer
- Define thermal radiation and conduction
- List common types of pyrometers
- Describe how common types of pyrometers work
- Explain why you measure the mold temperature
 - Describe how to use a thermocouple pyrometer to take a temperature measurement

Estimated completion time (hours): 1.5

JOB SETUP AND PRODUCTION FLOW

ARPM-1010 Job Setup and Production Flow

Course Description

The job setup process involves installing the mold into a press and other tasks to prepare the press for molding a specific part. The job setup process is closely related to the production process, during which parts are made.

By the end of this module, you will be able to

- List the purpose of a work order, bill of materials, order information, and router
- List the steps in the job setup process
- Describe how an insert loading tray operates
- Explain how knockout pins operate
- Describe how blow-off tools operate
- List the steps in the production process flow
- Understand the importance of checking the press status
- Explain the purpose of the first heat
- List examples of tests performed during the first heat inspection
- Calculate the scrap rate
- List several methods for cleaning a mold

Estimated completion time (hours): 1.0

INTRODUCTION TO RUBBER MANUFACTURING

ARPM-1011 Introduction to Rubber Manufacturing

Course Description

Rubber products are everywhere, including your car, home, and workplace. This module provides an overview of how rubber products are manufactured and your responsibilities while on the job.

By the end of this module, you will be able to

- Explain where rubber comes from
- Describe the basic steps used to manufacture a finished rubber product
- List some of the ingredients used to create rubber compound
- Describe some of the physical properties of a rubber product
- Explain the importance of heat energy in manufacturing a rubber product
- Describe three main types of rubber processing
- List examples of products created by each type of rubber processing
- Understand the importance of quality, safety, and cost awareness in rubber manufacturing

Estimated completion time (hours): 1.0

ARPM-1012 Materials Used in Rubber Manufacturing

Course Description

You can't manufacture products without raw materials. This module provides information about the rubber polymer and other materials used to manufacture molded or extruded rubber products. It also discusses the labels used to control inventory throughout the manufacturing process.

By the end of this module, you will be able to

- List typical ingredients in a rubber compound
- Discuss the qualities of different types of rubber compounds
 - Understand the different types of inserts used in compression and transfer molding
- Explain how inserts are identified
- Describe the different parts of a rubber compound label
- Describe the importance of the first in, first out method to control inventory
- Explain the importance of proper material handling
- List possible sources of material contamination

Estimated completion time (hours): 1.0

ARPM-1014 Safety in a Manufacturing Environment

Course Description

While it isn't possible to eliminate every possible hazard in the workplace, you can take proactive steps to minimize them. Start by analyzing your work area to identify the risks and then work with your supervisor and coworkers to minimize the risks. You can help everyone be safer at work.

By the end of this module, you will be able to

- List possible safety hazards in a rubber manufacturing environment
- Describe the possible consequences of a workplace accident
- Explain the purpose of several basic safety practices
- Describe various types of personal protective equipment
- Explain safe material handling practices
- Describe possible hazards from people-machine interactions
- Define pinch points
- List different types of machine safety devices
- Explain why housekeeping is an important safety practice

Estimated completion time (hours): 1.4

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MATERIAL MIXING

ARPM-1015 Material Mixing Technology

Course Description

You can't manufacture rubber products without rubber compound. Mixing rubber compound is the process of blending ingredients so that the final product has the qualities the customer requires.

By the end of this module, you will be able to

- Explain why the recipe is so important in mixing
- List the steps in the mixing process
- Define the terms single-pass mixing and two-pass mixing
- Describe the machines used during weigh-up
- List the parts of an internal mixer
- Describe how an internal mixer operates
- List the parts of a mill
- Describe how a mill operates
- List the parts of a batch-off machine
- Describe how a batch-off machine operates

Estimated completion time (hours): 1.3

ARPM-1016 Material Mixing Operating Tasks

Course Description

Material Mixing Operator Tasks

The tasks you perform in the mixing department are critical to producing quality rubber products. If the rubber compound is not mixed properly, it will be difficult or impossible for employees in the production department to do their jobs. Let's look at tasks you might perform as an operator in the mixing department and how they can affect the rubber compound.

By the end of this module, you will be able to

- List tasks operators in the weigh-up area might perform
- Explain the importance of verifying the correct recipe
- Define zeroing and tolerance as they relate to weighing ingredients
- Describe tasks operators in the mixing area might perform
- Explain the difference between the mixer machine conditions and the machine cycle
- Describe tasks operators in the mill area might perform
- Define the terms cut down, partial cut down, banding, and rolling a "pig"
- Describe tasks operators in the batch-off area might perform
- Explain two methods of applying anti-tack solution
- Describe why the loop length is important
- Explain different types of testing you might perform in the mixing department
- List typical product defects that can occur in the mixing department
- List common problems you might encounter in the mixing department

Estimated completion time (hours): 1.3

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COMPRESSION & TRANSFER MOLDING

ARPM-1017 Compression Molding Technology

Course Description

Compression molding is one method of producing molded rubber parts. This module provides an overview of compression molding and your role in operating a compression molding press. By the end of this module, you will be able to

- Describe how a molded rubber part is formed
- Describe how compression molding works
- List the main parts of a compression molding machine
- List the main parts of a mold
- Explain the primary steps in the compression molding cycle
- Explain where heat is added to the rubber compound
- Describe how a process setup sheet is used
- List common parameters found on a process setup sheet
 - List the types of functions found on the control panel of a compression molding machine

Estimated completion time (hours): 1.2

ARPM-1018 Transfer Molding Technology

Course Description

Transfer molding is one method of producing molded rubber parts. This module provides an overview of transfer molding and your role in operating a transfer molding press.

By the end of this module, you will be able to

- Describe how a molded rubber part is formed
- Describe how transfer molding works
- List the main parts of a transfer molding press
- List the main parts of a mold
- Explain the primary steps in the transfer molding cycle
- Explain where heat is added to the rubber compound
- Describe how a process setup sheet is used
- List common parameters found on a process setup sheet
 - List the types of functions found on the control panel of a transfer molding press

Estimated completion time (hours): 1.3

ARPM-1019 Compression and Transfer Molding Operator Tasks

Course Description

Before starting work as a compression or transfer molding press operator, it's a good idea to understand the types of tasks you will perform. This module describes the types of tasks you might perform in your job.

By the end of this module, you will be able to

- Describe tasks you will perform at the start of your shift, before molding parts
- List the steps in the molding cycle
- Define the term heat
 - List other tasks you might perform while parts are curing, including deflashing and inspecting parts
- Describe several common defects you might see when inspecting parts
- Define the term mold fouling

Estimated completion time (hours): 1.0

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INJECTION MOLDING

ARPM-1020 Injection Molding Technology

Course Description

Injection molding is a common method of molding rubber parts. This module describes the equipment used for injection molding and the steps in the injection molding process.

By the end of this module, you will be able to

- Describe how an injection molded part is formed
- Define the terms molded part and mold cavity
- List the parts of an injection molding machine
- List the parts of a mold used for injection molding
- Describe how rubber fills the mold cavities
- Explain the steps in the injection molding cycle
- Understand where heat is added to the rubber compound
- Describe what the process setup sheet is used for
- Define the term shot size
- Describe typical controls on an injection molding press
- Explain the different modes of operation on an injection molding press

Estimated completion time (hours): 1.5

ARPM-1021 Injection Molding Operator Tasks

Course Description

If you are going to run an injection molding machine, it's a good idea to understand the types of tasks you will perform. This module describes the responsibilities of an injection molding operator.

By the end of this module, you will be able to

- Understand typical tasks performed before, during, and after molding parts
- Explain the importance of verifying the materials, machine settings, and safety devices
 - Understand the importance of conducting a visual inspection of the injection molding machine
- Explain why compound is purged before molding parts
- List the basic steps to operate an injection molding machine
- List other tasks you might perform while parts are being cured in the machine
- List tasks you might perform after molding products
- List methods you might use to inspect parts
- Describe typical defects that might occur during injection molding
- Describe possible machine and process failures

Estimated completion time (hours): 1.2

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EXTRUSION

ARPM-1022 Extrusion Technology

Course Description

Extrusion is one method of producing rubber parts. This module provides an overview of extrusion and your role in operating an extruder.

By the end of this module, you will be able to

- Describe how extruded parts are formed
- List methods of curing extruded parts
- List the parts of an extruder
- Describe the controls commonly found on an extruder's control panel
- Describe different types of dies
- Explain why screens are used with dies
- Describe how dies are mounted in the extruder head
- Understand why dies are heated
- Describe several different extruder processes
- Describe how to determine proper compound feed
- Explain how rubber compound flows through the extruder
- List the basic settings found on a process setup sheet
- Describe how process settings affect the machine functions

Estimated completion time (hours): 1.3

ARPM-1023 Extrusion Operator Tasks

Course Description

Before starting work as an extruder operator, it's a good idea to understand the types of tasks you will perform. This module describes the types of tasks you might perform in your job.

By the end of this module, you will be able to

- Understand typical tasks performed before, during, and after extruding products
- Explain the importance of verifying the materials and extruder settings
- Understand the importance of conducting a visual safety inspection of the extruder
 - Understand the equipment used to print information or stripes on the rubber extrudate
 - Understand the equipment used to shape extruded cross sections during the autoclave curing process
- Describe several common defects you might see when inspecting parts
- Describe the types of records that you may be required to keep
- List possible types of machine and process failures
- Describe tasks you might perform after extruding products

Estimated completion time (hours): 1.0