Workbook

Good Manufacturing Practices

Association of Rotational Molders International

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The Association of Rotational Molders (ARM) International is a worldwide trade association representing manufacturers of rotationally molded products, industry suppliers, designers, and professionals worldwide. ARM International is the primary voice of the industry and the source for information on rotational molding.

ARM International produces an array of educational and technical materials that are provided to its members; selected items are also available to non-members. For information on the Association of Rotational Molders International and its educational materials, please contact:

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ARM International and its Processes, Equipment and Tooling Committee have developed this publication.

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Summary of

Good Manufacturing Practices

1. Follow applicable policies and procedures.
2. Ensure proper material color and selection.
3. Ensure proper weighing.
4. Ensure proper venting.
5. Apply mold release properly.
6. Provide parting line protection.
7. Reduce contamination.

Instructions

Welcome to the review of ARM International's Good Manufacturing Practices videotape. Follow these steps to complete the workbook:

1. Watch Part 1 of the videotape. When prompted, stop the tape and answer the questions in Part 1 of the workbook.
2. Check your answers and review any missed questions by replaying Part 1 of the video.
3. When you are sure you know all the answers to Part 1, continue to play Part 2 of the videotape.
4. Answer and check your questions for Part 2; follow the same steps for Part 3.

Part 1

1 Which of the following steps should you take to ensure safety on the job? *(Check all that apply)*

- ◯ **A.** Use proper footwear
- ◯ **B.** Use shoulder pads
- ◯ **C.** Use eye protection
- ◯ **D.** Use hearing protection
- ◯ **E.** Use respiratory protection as needed
- ◯ **F.** Use a bulletproof vest
- ◯ **G.** Use proper head protection

2 Before you start a job, you should check mounting plates and the mold for loose or missing bolts because: *(Check all that apply)*

- ◯ **A.** A mold that is not securely attached to the arm can fall off and injure you or a co-worker
- ◯ **B.** One bolt is usually enough to hold a heavy mold on an arm
- ◯ **C.** The mold may be damaged in the fall, interrupting production
- ◯ **D.** A loose or missing bolt may prevent the mold from closing properly resulting in a defective part
- ◯ **E.** Fewer bolts means it will be quicker to close the mold

3 After the mold is charged and closed, you should check to make sure that all retaining bolts or clamps are tight. *(Check one)*

- ◯ **A.** True
- ◯ **B.** False

4 **All bolts should be long enough for their purpose, and you should only use proper size bolts for the thread being used.** *(Check one)*

- ◯ **A.** True
- ◯ **B.** False

5 **What should you do if a bolt or clamp breaks or seizes during production?** *(Check all that apply)*

- ◯ **A.** Notify your supervisor or maintenance person immediately
- ◯ **B.** Take a break
- ◯ **C.** Leave it for the next shift

6 **When checking for material and color, you should:** *(Check all that apply)*

- ◯ **A.** Check that the material is correct against your work instructions / work order
- ◯ **B.** Ignore any color mismatch or contamination in the material
- ◯ **C.** Check that the color is correct against your work instructions / work order
- ◯ **D.** Remove your sunglasses

7 **You can assure color quality by doing which of the following?** *(Check all that apply)*

- ◯ **A.** Using a signed off customer sample as a reference
- ◯ **B.** Consulting a sample color chip at your machine
- ◯ **C.** Switching samples if the color doesn't match
- ◯ **D.** Obtaining first part approval from your supervisor for each new lot of material

Part 2

1 **If you do not have an automatically zeroing scale, remember to:**
(Check all that apply)

- ◯ **A.** Weigh the weighing container
- ◯ **B.** Add the container's weight to the charge weight to get the total weight
- ◯ **C.** Do not weigh the container

2 **On a scale that does not automatically zero, if your weighing container weighs 2 pounds and your part specification calls for a 6 pound charge, the total weight will be:** *(Check one)*

- ◯ **A.** 2 pounds
- ◯ **B.** 6 pounds
- ◯ **C.** 8 pounds

3 **If you have an automatic scale that takes the weight of the container into account, place the container on the scale and press the "tare" button. The scale will take the weight of the container and:** *(Check one)*

- ◯ **A.** Automatically drop to zero
- ◯ **B.** Show the weight of the container

4 **Venting problems are the number one cause of rejects.** *(Check one)*

- ◯ **A.** True
- ◯ **B.** False

5 **You can prevent venting problems by having the right materials handy for venting purposes. These include:** *(Check all that apply)*

- ◯ **A.** Filler material
- ◯ **B.** Rolled up newspaper
- ◯ **C.** Teflon tubes
- ◯ **D.** Copper or brass tubes

6 **To insert a vent properly:** *(Check all that apply)*

- ◯ **A.** Extend vent to center of cavity
- ◯ **B.** Push it in until it reaches the other side
- ◯ **C.** Leave it out for maximum venting
- ◯ **D.** Make sure that it is secure and will not fall out

7 **Filter material should be packed:** *(Check one)*

- ◯ **A.** Tightly
- ◯ **B.** Loosely

8 **Check vent tubes and change filler material:** *(Check one)*

- ◯ **A.** Every cycle
- ◯ **B.** Every hour
- ◯ **C.** Every day
- ◯ **D.** Every week

9 **Failure to install a vent could result in:** *(Check all that apply)*

- ◯ **A.** Fire in the oven
- ◯ **B.** Damage to the mold or the part
- ◯ **C.** A longer coffee break
- ◯ **D.** More efficient and faster cycles for parts

Part 3

1 Too much mold release causes: *(Check one)*

- ◯ **A.** Sticking
- ◯ **B.** Excessive warpage

2 Too little mold release causes: *(Check all that apply)*

- ◯ **A.** Total mold seizure
- ◯ **B.** Selective sticking
- ◯ **C.** Area whitening
- ◯ **D.** Warpage and pitting

3 The best defense against problems at the parting line is to: *(Check all that apply)*

- ◯ **A.** Keep material off the parting line during loading
- ◯ **B.** Ignore build up
- ◯ **C.** Check the parting lines after every cycle
- ◯ **D.** Do not use metal scrapers on soft metal parting lines
- ◯ **E.** Ignore parting line bolts that are still attached during demolding

4 Remove material that has built up along the parting line only with tools that are harder than the mold material. *(Check one)*

- ◯ **A.** True
- ◯ **B.** False

5 If the mold is stuck, you should: *(Check one)*

- ◯ **A.** Pry only at the parting line
- ◯ **B.** Pry on the pry points

6 Dust, dirt, and small pieces of hardened material can find their way in to molded parts. When this happens, blemishes or irregularities result, making the part unsuitable for sale. *(Check one)*

- ◯ **A.** True
- ◯ **B.** False

7 To prevent contamination in parts, you should:
(Check all that apply)

- ◯ **A.** Watch for contaminated product from the supplier
- ◯ **B.** Cover all containers of powder that aren't in use
- ◯ **C.** Mix your cigarette ash in with the powder
- ◯ **D.** Separate colored resin boxes from natural boxes
- ◯ **E.** Sweep up spilled powder from the floor and put it back into the container
- ◯ **F.** Watch for foreign matter in bulk containers when filling molds
- ◯ **G.** Tag the container if contamination is present
- ◯ **H.** Not worry if you cannot find your cigarette lighter after the mold is closed
- ◯ **I.** Keep the parting lines clean

Answers

Part 1:

1. A, C, D, E, G
2. A, C, D
3. A
4. A
5. A
6. A, C
7. A, B, D

Part 2:

1. A, B
2. C
3. A
4. A
5. A, C
6. A, D
7. B
8. A
9. A, B

Part 3:

1. B
2. A, B, C
3. A, C, D
4. B
5. B
6. A
7. A, B, D, F, G, I

A Skillful Operator Defined

- Takes care throughout the process.
- Is always patient.
- Pays attention to detail.
- Uses his/her own judgment constantly.
- Knows that timing is everything.
- Uses instinct as well as technical skills.
- Follows a system; doesn't get behind or ahead of him/herself.
- Does it right the first time.
- Manages waiting time by tending to housekeeping chores.
- Always plans for and solves problems.
- Uses tools and equipment skillfully.
- Observes and reacts immediately—doesn't wait to take action.
- Makes sure that documentation is current and accurate.

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