

**INTRODUCTION**

Concrete paving is sometimes considered a specialty among the many other concrete occupations. However, it is important to remember that all of the skills you've learned so far will be used. Floating, edging, and surface preparation are all parts of paving roads, highways, and interstates.

**FOCUS  
ASSIGNMENTS**

**FOCUS ASSIGNMENTS**

1. Choose a paving machine and learn about its characteristics — what it does, where it is used and anything else you find interesting.
2. Give a very brief, one or two minute, presentation to your class on your findings.



**UNIT  
OBJECTIVE**

After completing this unit, you will show the following competencies by mastering the activities on the Job Sheet and by scoring at least 85% on the Written Test.

**SPECIFIC  
OBJECTIVES**

1. Identify types of paving equipment.
2. Identify characteristics of a slipform paver.
3. Identify characteristics of a form paver.
4. Identify characteristics of a tube float machine.
5. Identify characteristics of a tube or roller-type finishing machine.
6. Match types of tools used on pavements to their correct uses.
7. Identify types of slipform curb machines.
8. Identify characteristics of a slipform curb machine.



9. Identify types of work bridges.
10. Identify types of automatic finishers.
11. Arrange in order step-by-step procedures to construct concrete pavements.
12. Check, level, and finish pavement behind a paving machine.  
(Job Sheet)



**OBJECTIVE 1**

Optional Activities/  
Resources in Instructor's  
Guide

**Identify types of paving equipment.**

- Subgrade trimmer (Figure 1)

FIGURE 1



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- Placer/spreader (Figure 2)

FIGURE 2



- Slipform paver (Figure 3)

FIGURE 3



- Texture/curing machine (Figure 4)

FIGURE 4



- Tube or roller-type power screed (Figure 5)

FIGURE 5



- Form paver (Figure 6)

FIGURE 6



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- Paving train

✓ **NOTE:** In a paving train, one piece of equipment follows another, enabling all phases of placing and finishing to be completed in the most efficient manner. (Figure 7)

FIGURE 7



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## OBJECTIVE 2

Optional Activities/  
Resources in Instructor's  
Guide

### Identify characteristics of a slipform paver.

- Follows preset string line
- Pulls edge forms behind it
- Levels concrete by means of a strikeoff screed
- Smooths surface of pavement and leaves it ready for final finish

## OBJECTIVE 3

Optional Activities/  
Resources in Instructor's  
Guide

### Identify characteristics of a form paver.

- Travels on preset forms
- Levels concrete by means of two strikeoff screeds
- Smooths pavement and leaves it ready for final finish



## OBJECTIVE 4

Optional Activities/  
Resources in Instructor's  
Guide

### Identify characteristics of a tube float machine.

- Steers automatically by use of sensor units that trace a preset string line
- Levels surface of pavement
- Finishes surface of pavement
- Seals the surfac

## OBJECTIVE 5

Optional Activities/  
Resources in Instructor's  
Guide

### Identify characteristics of a tube or roller-type machine.

- Steers automatically by use of sensor units that trace a preset string line
- Seeks out variations in slab profile, fills and levels slab
- Gives final touch to slab profile accuracy and smoothness
- Textures surface of pavement

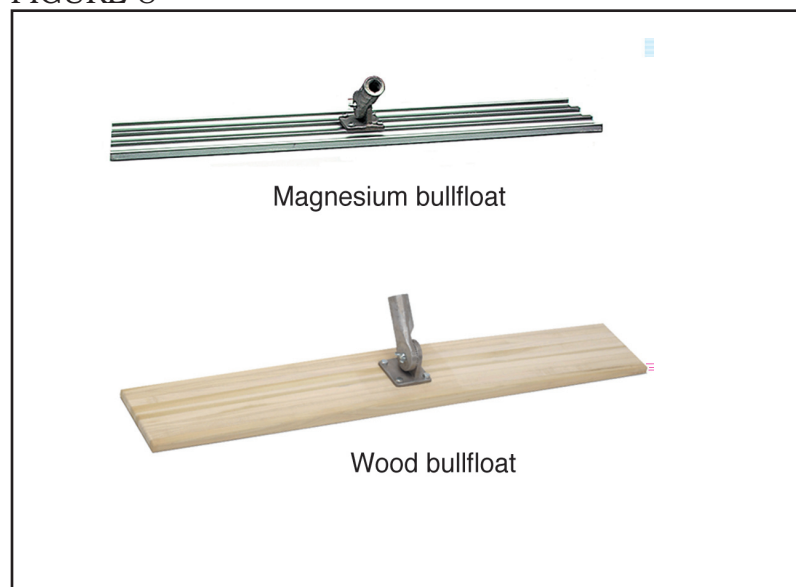
## OBJECTIVE 6

Optional Activities/  
Resources in Instructor's  
Guide

### Match types of tools used on pavements to their correct uses.

- **Bullfloat** — Used to level and smooth the surface of concrete (Figure 8)

FIGURE 8



- **Margin trowel** — Used for corner work (Figure 9)

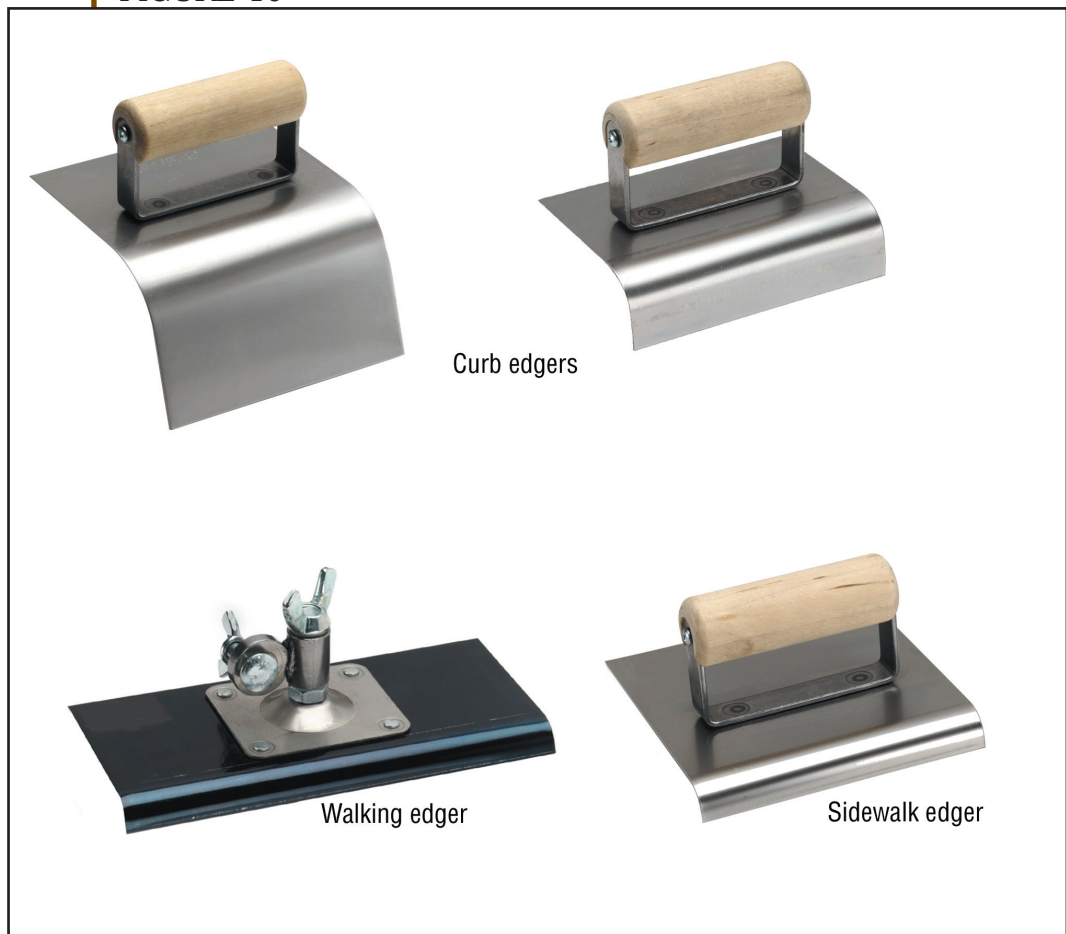
FIGURE 9



- **Edger** — Used to form or mold radius at edges and joints in concrete (Figure 10)

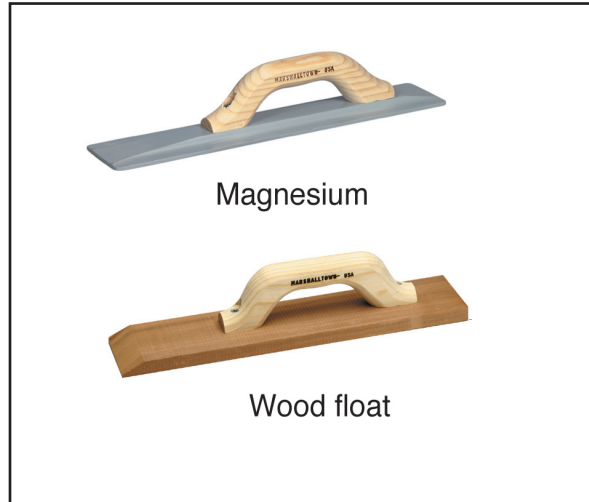
✓ **NOTE:** In some areas and for some curbs, edgers with a larger radius up to three inches may be used.

FIGURE 10



- **Hand float** — Used to level and close up surface of concrete on edges and sections of pavement where machines are not used; also used to shape curbs and curbs and gutters (Figure 11)

FIGURE 11



- **Paving jointers** — Used to cut joints in fresh concrete
  - ❑ Paving jointer bit (Figure 12)

FIGURE 12



- ❑ Deep bit hand type jointer (Figure 13)

FIGURE 13



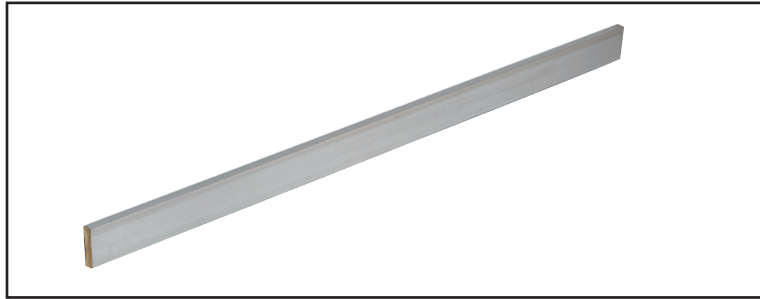
- ❑ Long handled walking type jointer (Figure 14)

FIGURE 14



- **Straightedge (screed)** — Used to rod small sections of concrete where machines would be impractical; also used to help shape gutters and the face of unformed curbs (Figure 15)

FIGURE 15



- **Roller-type hand screed** — Used to rod low slump concrete (Figure 16)

FIGURE 16



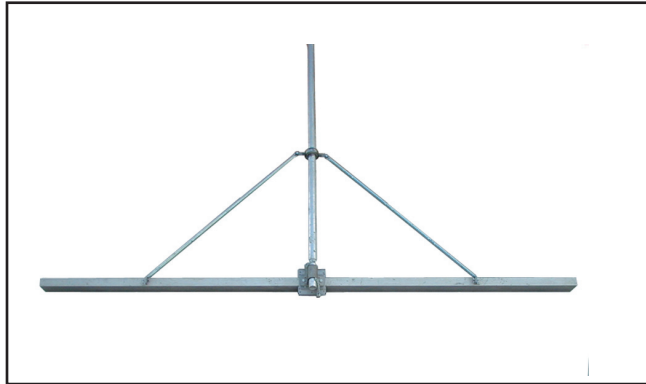
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- **Paver's scraping straightedge** — Used for checking and leveling surface of concrete (Figure 17)

✓ **NOTE:** This tool may also be called a bump cutter.

FIGURE 17



- **Paving brooms and tines** — Used to texture fresh concrete

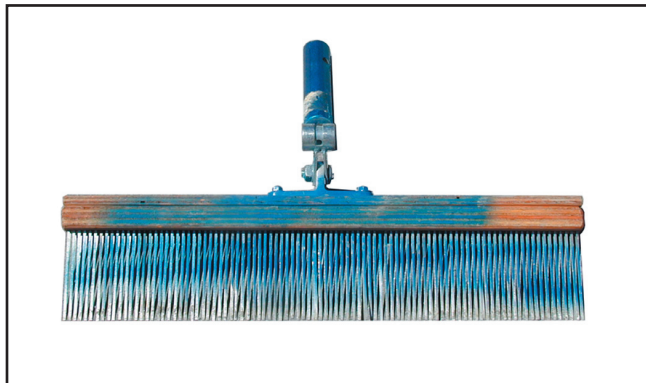
- Nylon brooms and tines (Figure 18)

FIGURE 18



- Texture broom (tine broom) (Figure 19)

FIGURE 19



## OBJECTIVE 7

Optional Activities/  
Resources in Instructor's  
Guide

### Identify types of slipform machines.

- Curb-and-gutter slipform paver (Figure 20)

FIGURE 20



- Median barrier slipform paver (Figure 21)

FIGURE 21



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## OBJECTIVE 8

Optional Activities/  
Resources in Instructor's  
Guide

### Identify characteristics of a slipform curb machine.

- Follows a preset string line
- Shapes and forms curb and gutter automatically
- Leaves surface smooth and ready for final finishing

## OBJECTIVE 9

Optional Activities/  
Resources in Instructor's  
Guide

### Identify types of work bridges.

#### WORDS YOU SHOULD KNOW

<b>work bridge</b>	type of portable platform that spans the pavement and is used by concrete masons when finishing concrete
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- Standard type for flat slabs (Figure 22)

FIGURE 22



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- Powered type for flat slabs (Figure 23)

FIGURE 23



## OBJECTIVE 10

Optional Activities/  
Resources in Instructor's  
Guide

### Identify types of automatic finishers.

- Burlap (Figure 24)

FIGURE 24



- Texturing (Figure 25)

FIGURE 25



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## OBJECTIVE 11

**Arrange in order step-by-step procedures used to construct concrete pavement.**

### WORDS YOU SHOULD KNOW

<b>profilograph</b>	instrument used to check finished surface of pavement by measuring profile from gradeline of the finished surface over a quarter of a mile
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1. Prepare subgrade or subbase
2. Set forms (if slipform paver is not used)
3. Install vapor barrier (if specified)
4. Install dowel bar assemblies for joints (where and if specified)
5. Install reinforcing steel (where and if specified)
6. Make final inspection
7. Wet down subgrade sufficiently (if vapor barrier is not used)
8. Place and spread concrete
9. Compact (vibrate) and straightedge concrete



10. Check concrete surface with paver's scraping straightedge
11. Edge concrete
12. Finish concrete by texturing surface
13. Locate and mark joints for sawing
14. Cover and/or cure
15. Saw and seal joints (when concrete is hard enough)
16. Apply surface sealer
17. Check ride with profile meter or profilograph

## OBJECTIVE 12

**Complete the Job Sheet.**



Name \_\_\_\_\_ Score \_\_\_\_\_

**OBJECTIVE 12**

**Check, level, and finish pavement behind a paving machine.**

**BASIC SKILLS**



Employability

**EQUIPMENT  
AND SUPPLIES**

- Bullfloat
- Hand float
- Hand trowel (where required)
- Edger with one-half-inch radius
- Edger with one-inch radius
- Margin trowel
- Paver's straightedge or bump cutter
- Shovel
- Sprayer
- Concrete
- Curing agent
- Personal protective equipment

✓ **NOTE:** Refer to C.F.R 1926.28 Sub Part C in regard to personal protective equipment.

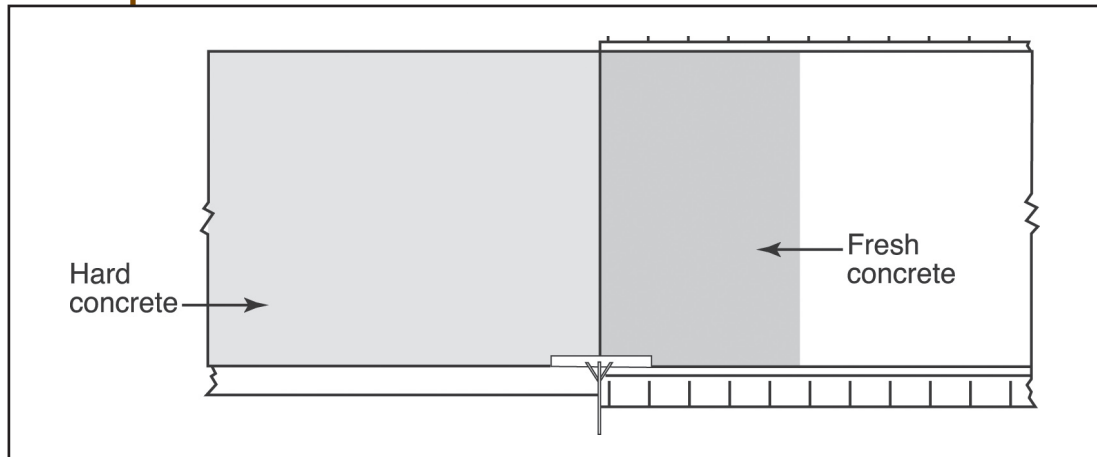


## PROCEDURE

Yes No

1. Start at the header and place the paver's straightedge so one half is on fresh concrete and the other half is across the header or hard concrete. (Figure 1)

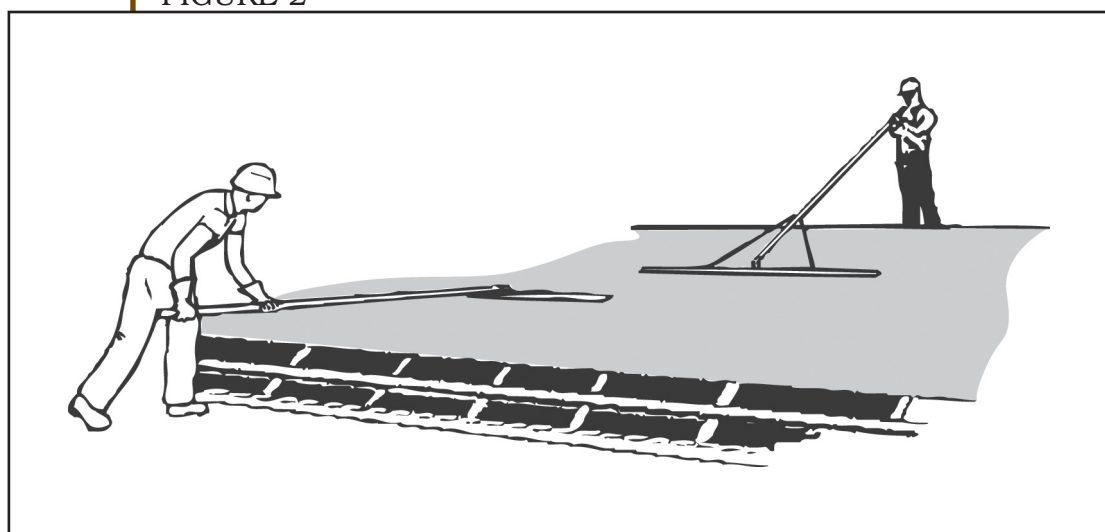
FIGURE 1



2. Tilt the handle down and slowly push the straightedge across the pavement a little past the center line. (Figure 2)

✓ **NOTE:** Another finisher will be doing the same job on the opposite side of the pavement. Therefore, one finisher must start first and advance ahead of the other finisher. After the first pass, if the straightedge rides flat across the slab and does not show high or low places, the surface is flat.

FIGURE 2



**Yes No**

- 3. Check for low places.
- 4. Use a shovel to spread concrete in low areas.

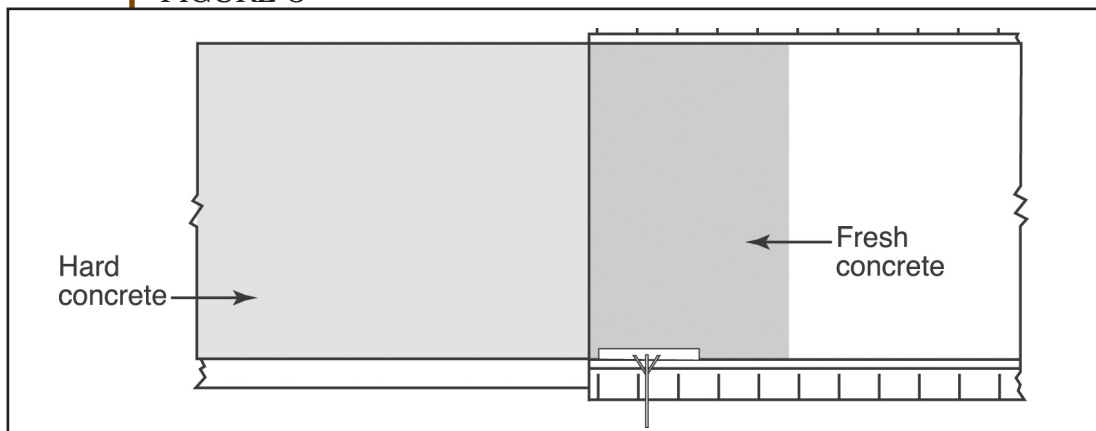
✓ **NOTE:** Place a small amount of concrete first so it may be worked in with ease. If necessary, add more.

- 5. Push the straightedge across the slab, then pull it back, cutting off humps and dragging the excess concrete off the edge of the pavement.

✓ **NOTE:** Humps will be detected by the way the straightedge tears the surface.

- 6. Be sure the first five feet of paving are flat.
- 7. Move the straightedge toward placement until the full length of the straightedge is lying on the fresh concrete. (Figure 3)

FIGURE 3



- 8. Repeat steps 2 through 7 until the entire pavement has been checked and flattened.
- 9. Finish the last pass the same as the first pass with half of the straightedge on the fresh concrete and the other half across the hard concrete.

✓ **NOTE:** Be sure that with each pass you proceed only five feet or half the length of the straightedge.

- 10. Continue checking the surface of the concrete until the pavement is flat.



**Yes No**

11. Follow up with a bullfloat by positioning the handle so that the bullfloat is slightly tilted up when pushing forward.

12. Push the bullfloat halfway across the slab.

13. Position the handle so that the bullfloat is slightly tilted up when pulling back.

14. Pull the bullfloat back across the slab.

✓ **NOTE:** To check for flatness, position the bullfloat so that the blade is flat to the surface of the pavement.

15. Check for high places.

16. Position the handle so that the blade is relatively flat to the surface and with several quick movements pull the bullfloat backward, cutting off the hump.

17. Check for low places.

18. Place small amount of concrete in the low area and work it with a quick back and forth movement of the bullfloat, continuing until the low place has been flattened.

19. Continue this procedure until the pavement is completely floated.

20. Be sure the concrete is hard enough and is level with the top of the forms.

21. Run the edger.

✓ **NOTE:** Quite often walking-type edgers are used on pavement.

A. Push the blade of the margin trowel into the concrete along the edge of the form.

B. Draw the trowel lengthwise along the form.

✓ **NOTE:** This will open up the surface next to the form.



**Yes No**

- C. Place the edger in position along the form or concrete and slightly tilt up from the edge; at the same time push down on the handle and push forward.
- D. At the end of the stroke, slightly tilt the edger and pull backward.
- E. Continue this forward and backward movement until the entire pavement has been edged.

✓ **NOTE:** When running the edger, be sure to hold the edger level with the surface of the concrete. Do not edge concrete that is too wet. This will create high and low places.

- 22. Finish the pavement with a texturing machine.
- 23. Rerun all edges and expansions after the pavement has been textured, if specified.
- 24. Apply a curing agent as soon after finishing as possible without damaging the surface.
- 25. Use a margin trowel, brush, and water to clean tools and equipment.
- 26. Have the instructor check your work.
- 27. Clean the work area and return tools and equipment to proper storage.



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## SKILL TEST RECORD

### PRODUCT EVALUATION

**Evaluator note:** Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of “3” or higher to demonstrate student mastery. (See Key below.) A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

Safety	4	3	2	1
Use of tools	4	3	2	1
General appearance	4	3	2	1
Overall performance	4	3	2	1

### AVERAGE RATING

**Evaluator note:** To obtain an average rating for the Profile of Training Mastery, total the points in Product Evaluation and divide by the total number of criteria. Circle the rating on the Key.

### KEY

- 4 Skilled** — Can perform job with no additional training
- 3 Moderately Skilled** — Has performed job during training program; limited additional training may be required
- 2 Limited Skill** — Has performed job during training program; additional training is required to develop skill
- 1 Unskilled** — Is familiar with process, but is unable to perform job

### EVALUATOR'S COMMENTS

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