

Instruction Sheet for the Candidate

Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Shell Mold Casting
Purpose of Assessment	Formative Assessment
Candidate Details	Name _____ Registration/Roll Number _____
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within 04 Hrs. time frame (for practical demonstration & assessment):</p> <ul style="list-style-type: none"> • Arrange pattern for casting • Arrange mold for casting • Assemble mold for casting • Cast molten metal in mold • Remove the casting from mold
Time: 04 Hrs.	During a practical assessment, under observation by an assessor, you are required to
Minimum Evidence Required	<p>Arrange pattern for casting P1. Handle two-piece metal pattern as per job requirement P2. Use Aluminum pattern for mass production of patterns P3. Use Graphite pattern for casting of reactive materials.</p> <p>Arrange mold for casting P1. Heat up the pattern as per job requirements P2. Coat the pattern with a lubricant to facilitate removal. P3. Clamp the heated pattern to a dump box (containing a mixture of molding material). P4. Invert the dump box allowing molding material (Sand-resin mixture) to coat the pattern. P5. Make a shell around the heated pattern P6. Eject the shell from the pattern.</p> <p>Assemble mold for casting P1. Join the two shell together as per job requirement P2. Insert core in the mold, if required. P3. Clamp mold parts to form the complete shell mold. P4. Place the shell mold into a flask supported by a backing material.</p>

	<p>Cast molten metal in mold</p> <p>P1. Pour molten metal from ladle through gating system</p> <p>P2. Fill the mold cavity completely with the molten metal</p> <p>P3. Perform cooling of molten metal as per SOPs</p> <p>P4. Carryout solidification of molten metal into final casting</p> <p>Remove the casting from mold</p> <p>P1. Break the mold after the metal is cool down</p> <p>P2. Trim excess metal from the feed system, if any</p> <p>P3. Remove any sand from the mold, if any</p> <p>P4. Perform post casting inspection for any defect, if any</p> <p>P5. Prepare the inspection report as per SOPs</p>
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Self-Assessment Checklist

Candidate Name	
Registration No.	
Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Shell Mold Casting
Purpose of Assessment	Formative Assessment
Assessment Task	<ul style="list-style-type: none"> • Arrange pattern for casting • Arrange mold for casting • Assemble mold assembly for casting • Cast molten metal in mold • Remove the casting from mold

I can.....

Performance Criteria	Yes	No
P1. Handle two-piece metal pattern as per job requirement	<input type="checkbox"/>	<input type="checkbox"/>
P2. Use Aluminum pattern for mass production of patterns	<input type="checkbox"/>	<input type="checkbox"/>
P3. Use Graphite pattern for casting of reactive materials.	<input type="checkbox"/>	<input type="checkbox"/>
P4. Heat up the pattern as per job requirements	<input type="checkbox"/>	<input type="checkbox"/>
P5. Coat the pattern with a lubricant to facilitate removal.	<input type="checkbox"/>	<input type="checkbox"/>
P6. Clamp the heated pattern to a dump box (containing a mixture of molding material).	<input type="checkbox"/>	<input type="checkbox"/>
P7. Invert the dump box allowing molding material (Sand-resin mixture) to coat the pattern.	<input type="checkbox"/>	<input type="checkbox"/>
P8. Make a shell around the heated pattern	<input type="checkbox"/>	<input type="checkbox"/>
P9. Eject the shell from the pattern.	<input type="checkbox"/>	<input type="checkbox"/>
P10. Join the two shell together as per job requirement	<input type="checkbox"/>	<input type="checkbox"/>
P11. Insert core in the mold, if required.	<input type="checkbox"/>	<input type="checkbox"/>
P12. Clamp mold parts to form the complete shell mold.	<input type="checkbox"/>	<input type="checkbox"/>
P13. Place the shell mold into a flask supported by a backing material.	<input type="checkbox"/>	<input type="checkbox"/>
P14. Pour molten metal from ladle through gating system	<input type="checkbox"/>	<input type="checkbox"/>
P15. Fill the mold cavity completely with the molten metal	<input type="checkbox"/>	<input type="checkbox"/>
P16. Perform cooling of molten metal as per SOPs	<input type="checkbox"/>	<input type="checkbox"/>
P17. Carryout solidification of molten metal into final casting	<input type="checkbox"/>	<input type="checkbox"/>

P18. Break the mold after the metal is cool down	<input type="checkbox"/>	<input type="checkbox"/>
P19. Trim excess metal from the feed system, if any	<input type="checkbox"/>	<input type="checkbox"/>
P20. Remove any sand from the mold, if any	<input type="checkbox"/>	<input type="checkbox"/>
P21. Perform post casting inspection for any defect, if any	<input type="checkbox"/>	<input type="checkbox"/>
P22. Prepare the inspection report as per SOPs	<input type="checkbox"/>	<input type="checkbox"/>

Candidate's Signature_____ Assessor's Signature_____

Date: _____

Assessors Judgment Guide

Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Shell Mold Casting
Purpose of Assessment	Formative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Signature: _____
Assessment Outcome	<div style="display: flex; justify-content: space-between; align-items: center;"> COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> </div> Name of the Assessor _____ Assessor's code: _____ Signature: _____

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment		✓					
Other Requirement							

Observation Checklist

Assessment Task		<ul style="list-style-type: none"> • Arrange pattern for casting • Arrange mold for casting • Assemble mold assembly for casting • Cast molten metal in mold • Remove the casting from mold 		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Handle two-piece metal pattern as per job requirement			
2.	Use Aluminum pattern for mass production of patterns			
3.	Use Graphite pattern for casting of reactive materials.			
4.	Heat up the pattern as per job requirements			
5.	Coat the pattern with a lubricant to facilitate removal.			
6.	Clamp the heated pattern to a dump box (containing a mixture of molding material).			
7.	Invert the dump box allowing molding material (Sand-resin mixture) to coat the pattern.			
8.	Make a shell around the heated pattern			
9.	Eject the shell from the pattern.			
10.	Join the two shell together as per job requirement			
11.	Insert core in the mold, if required.			
12.	Clamp mold parts to form the complete shell mold.			
13.	Place the shell mold into a flask supported by a backing material.			
14.	Pour molten metal from ladle through gating system			
15.	Fill the mold cavity completely with the molten metal			
16.	Perform cooling of molten metal as per SOPs			
17.	Carryout solidification of molten metal into final casting			
18.	Break the mold after the metal is cool down			

19.	Trim excess metal from the feed system, if any			
20.	Remove any sand from the mold, if any			
21.	Perform post casting inspection for any defect, if any			
22.	Prepare the inspection report as per SOPs			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Knowledge Assessment

Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Shell Mold Casting
Purpose of Assessment	Formative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Candidate Signature: _____
Assessment Outcome	<div style="display: flex; justify-content: space-around;"> COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> </div> Name of the Assessor: _____ Assessor's code: _____ Signature of the Assessor: _____

Candidate's response is not required to be identical, but similar concepts and/or keywords must be used. Oral questioning may be used to clarify candidate understanding of topic and its application.

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)		Satisfactory	Not Satisfactory
1.	Describe shell mould casting process		
2.	Describe Mold creation techniques		
3.	Define Gating system		

4.	Explain Pouring techniques		

Feedback to the Candidate	
Candidate's Signature_____ Assessor's Signature _____	