

Instruction Sheet for the Candidate

Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Investment Casting
Purpose of Assessment	Formative Assessment
Candidate Details	Name_____ Registration/Roll Number_____
Guidance for Candidate	To meet this standard, you are required to complete the following within 04 Hrs. time frame (for practical demonstration & assessment): <ul style="list-style-type: none"> • Arrange pattern for Casting • Prepare mold for casting • Perform casting • Perform post-casting operations
Time: 04 Hrs.	During a practical assessment, under observation by an assessor, you are required to
Minimum Evidence Required	Arrange pattern for Casting <ol style="list-style-type: none"> 1. Arrange wax patterns as per requirement 2. Use cores to form any internal features within the pattern if required 3. Attach patterns to a central wax gating system (sprue, runners, and risers) to form a tree-like assembly Prepare mold for casting <ol style="list-style-type: none"> 1. Place wax tree-like assembly into mold flask 2. Prepare slurry by mixing ceramic powder with water and stir it homogenously 3. Perform degassing of slurry in vacuum chamber 4. Pour slurry into the flask to coat the wax pattern tree 5. Bake the shell as per standard to form a ceramic shell around the patterns and gating system 6. Remove the wax leaving a hollow ceramic shell that acts as a one-piece mold 7. Apply protective coating to mold as per standard Perform Casting <ol style="list-style-type: none"> 1. Pre-heat mold in a furnace as per SOP 2. Pour molten metal from a ladle into the gating system of the mold 3. Carry out complete filling of the mold cavity with liquid melt as per

	<p>standard operating procedure</p> <p>Perform post-casting operations</p> <ol style="list-style-type: none"> 1. Perform cooling of molten metal as per SOPs 2. Carryout solidification of molten metal into final casting 3. Remove casting flask as per standard procedure 4. Separate the casted parts from gating system either by sawing or cold breaking (using liquid nitrogen) 5. Perform post casting inspection for any defect, if any 6. Prepare the inspection report as per SOPs 7. Clean up work area and equipment 8. Dispose off waste at designated place
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Self-Assessment Checklist

Candidate Name	
Registration No.	
Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Investment Casting
Purpose of Assessment	Formative Assessment
Assessment Task	<ul style="list-style-type: none"> • Arrange pattern for Casting • Prepare mold for casting • Perform casting • Perform post-casting operations

I can.....

Performance Criteria	Yes	No
P1. Arrange wax patterns as per requirement	<input type="checkbox"/>	<input type="checkbox"/>
P2. Use cores to form any internal features within the pattern if required	<input type="checkbox"/>	<input type="checkbox"/>
P3. Attach patterns to a central wax gating system (sprue, runners, and risers) to form a tree-like assembly	<input type="checkbox"/>	<input type="checkbox"/>
P4. Place wax tree-like assembly into mold flask	<input type="checkbox"/>	<input type="checkbox"/>
P5. Prepare slurry by mixing ceramic powder with water and stir it homogenously	<input type="checkbox"/>	<input type="checkbox"/>
P6. Perform degassing of slurry in vacuum chamber	<input type="checkbox"/>	<input type="checkbox"/>
P7. Pour slurry into the flask to coat the wax pattern tree	<input type="checkbox"/>	<input type="checkbox"/>
P8. Bake the shell as per standard to form a ceramic shell around the patterns and gating system	<input type="checkbox"/>	<input type="checkbox"/>
P9. Remove the wax leaving a hollow ceramic shell that acts as a one-piece mold	<input type="checkbox"/>	<input type="checkbox"/>
P10. Apply protective coating to mold as per standard	<input type="checkbox"/>	<input type="checkbox"/>
P11. Pre-heat mold in a furnace as per SOP	<input type="checkbox"/>	<input type="checkbox"/>
P12. Pour molten metal from a ladle into the gating system of the mold	<input type="checkbox"/>	<input type="checkbox"/>
P13. Carry out complete filling of the mold cavity with liquid melt as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
P14. Perform cooling of molten metal as per SOPs	<input type="checkbox"/>	<input type="checkbox"/>
P15. Carryout solidification of molten metal into final casting	<input type="checkbox"/>	<input type="checkbox"/>
P16. Remove casting flask as per standard procedure	<input type="checkbox"/>	<input type="checkbox"/>

P17. Separate the casted parts from gating system either by sawing or cold breaking (using liquid nitrogen)	<input type="text"/>	<input type="text"/>
P18. Perform post casting inspection for any defect, if any	<input type="text"/>	<input type="text"/>
P19. Prepare the inspection report as per SOPs	<input type="text"/>	<input type="text"/>
P20. Clean up work area and equipment	<input type="text"/>	<input type="text"/>
P21. Dispose off waste at designated place	<input type="text"/>	<input type="text"/>

Candidate's Signature _____ Assessor's Signature _____

Date: _____

Assessors Judgment Guide

Qualification	National Vocational Certificate in Metal Forming & Processing Level 4
Competency Standard	Perform Investment 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 • Prepare mold for casting • Perform casting • Perform post-casting operations 		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Arrange wax patterns as per requirement			
2.	Use cores to form any internal features within the pattern if required			
3.	Attach patterns to a central wax gating system (sprue, runners, and risers) to form a tree-like assembly			
4.	Place wax tree-like assembly into mold flask			
5.	Prepare slurry by mixing ceramic powder with water and stir it homogenously			
6.	Perform degassing of slurry in vacuum chamber			
7.	Pour slurry into the flask to coat the wax pattern tree			
8.	Bake the shell as per standard to form a ceramic shell around the patterns and gating system			
9.	Remove the wax leaving a hollow ceramic shell that acts as a one-piece mold			
10.	Apply protective coating to mold as per standard			
11.	Pre-heat mold in a furnace as per SOP			
12.	Pour molten metal from a ladle into the gating system of the mold			
13.	Carry out complete filling of the mold cavity with liquid melt as per standard operating procedure			
14.	Perform cooling of molten metal as per SOPs			
15.	Carryout solidification of molten metal into final casting			
16.	Remove casting flask as per standard procedure			

17.	Separate the casted parts from gating system either by sawing or cold breaking (using liquid nitrogen)			
18.	Perform post casting inspection for any defect, if any			
19.	Prepare the inspection report as per SOPs			
20.	Clean up work area and equipment			
21.	Dispose off waste at designated place			
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 Investment Casting
Purpose of Assessment	Formative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Candidate Signature: _____
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> 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 metals and alloys		
2.	Melting points of various metals/alloys		
3.	Advantages of investment casting		

4.	Limitation of investment casting process		
5.	Why investment casting is preferred on other casting process		
6.	Define molds		

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