

Assessment Evidence Guide

For

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Level-3

Furnace Operator
(Formative Assessment)

8th -12th March 2021



**National Vocational & Technical
Training Commission**

Title of Qualification: Furnace Operator	CS Code:	Level: 3	Version:
Competency Standard Title: Operate Non-Electric Melting Furnace	Assessment Date (DD/MM/YY): Assessment Time:		

Candidate Details	Name: Registration/Roll Number:.....
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration & assessment):</p> <p>Assessment Task 1: Candidate is required to: Operate Pit furnace for melting of given metallic material</p> <p>Assessment Task 2: Candidate is required to: Operate cupola furnace for the melting of given metallic material</p> <p>And complete:</p> <ol style="list-style-type: none"> 1. Knowledge assessment test (Written or Oral) 2. Portfolios at the time of assessment (if any)
Minimum Evidence Required	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 1</p> <ul style="list-style-type: none"> • Inspect the lining of pit and crucible • Inspect the accessories of gas supply system and blower. • Place the empty crucible in the pit furnace on specific position for preheating. • Open gas valve and ignite gas in the pit furnace. • Switch off furnace after suitable preheating time. • Receive the metallic charge and put in crucible. • Ignite gas in the furnace for melting and place the cover on the pit. • Switch ON the blower to increase the intensity of fire. • Check the temperature of the charge with temperature gun • Remove the slag with the help of crucible tongs. • Switch off the furnace and remove cover for picking out the crucible.

	<p>During a practical assessment, under observation by an assessor, you will complete:</p> <p>Assessment Task 2</p> <ul style="list-style-type: none"> • Inspect the interior lining, slag hole and tap hole of the furnace. • Close the bottom door of furnace and put prop under it. • Prepare coke bed on bottom plate of cupola with suitable slope towards tap hole • Put soft wood pieces on the coke bed and ignite it. • Add more coke in cupola when it becomes red hot • Add metallic charge on the red-hot coke. • Add coke and metal charge periodically up to charging door. • Close tap and slag hole after soaking time. • Start air blast to increase the melting speed of molten metal. • Pour out the slag from slag hole and close the slag hole. • Pour molten metal into the ladle and close tap hole. <p>Portfolios required at the time of assessment (if any) for</p>
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Continued on following page

Assessors Judgment Guide (to be completed by the Assessor and signed both by the assessor and the candidate after the 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:

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							

Each Assessment Task (with performance criteria)				
Assessment Task 1		Description of assessment task 1		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
	Inspect the lining of pit and crucible			
	Inspect the accessories of gas supply system and blower.			
	Place the empty crucible in the pit furnace on specific position for preheating.			
	Open gas valve and ignite gas in the pit furnace.			
	Switch off furnace after suitable preheating time.			
	Receive the metallic charge and put in crucible.			
	Ignite gas in the furnace for melting and place the cover on the pit.			
	Switch ON the blower to increase the intensity of fire.			
	Check the temperature of the charge with temperature gun			
	Remove the slag with the help of crucible tongs.			
	Switch off the furnace and remove cover for picking out the crucible.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 2		Description of assessment task 2		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
	Inspect the interior lining, slag hole and tap hole of the furnace.			
	Close the bottom door of furnace and put prop under it.			
	Prepare coke bed on bottom plate of cupola with suitable slope towards tap hole			
	Put soft wood pieces on the coke bed and ignite it.			
	Add more coke in cupola when it becomes red hot			
	Add metallic charge on the red-hot coke.			
	Add coke and metal charge periodically up to charging door.			
	Close tap and slag hole after soaking time.			
	Start air blast to increase the melting speed of molten metal.			
	Pour out the slag from slag hole and close the slag hole.			
	Pour molten metal into the ladle and close tap hole.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Title of Qualification:	CS Code:	Level:	Version: 01
Competency Standard Title:	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

Guidance for Candidate	To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.
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Assessors Guide (to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name:..... Registration/Roll Number: Candidate Signature:
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: Assessor's code: Signature of the Assessor:

Title of Qualification:	CS Code:	Level:	Version: 01
Competency Standard Title:	Assessment Date (DD/MM/YY): Assessment Time: 30 min		

WRITTEN ASSESSMENT

Question	Candidate's answer
1. Define refractory material.	Refractory material is a material that is resistant to decomposition by heat, pressure or chemical attack and retains strength at high temperature.
2. Write some properties of refractory material.	Different properties of refractory materials are following. i High melting point ii High wear resistance iii High hardness iv High impact strength v High corrosion resistance, etc.
3. Write the names of any four refractory materials.	i Alumina Refractories ii Silica Refractories iii Magnesite Refractories iv Chromite Refractories v Zirconia Refractories
4. What is means by charging of a furnace?	Putting of the raw material in the furnace by any suitable mean is known as charging of the furnace.
5. Define slag.	Slag is the co-product or byproduct of a furnace. Slag is produced during melting or smelting process of a furnace. Slag composed of oxides, silicates, aluminates or alumino-silicates of impurity elements present in the charge.
6. Define coke.	Coke is the purified form of coal. Coal is heated in the absence of air in coke ovens at 1100 to 1500 degree Celsius to convert it in coke.