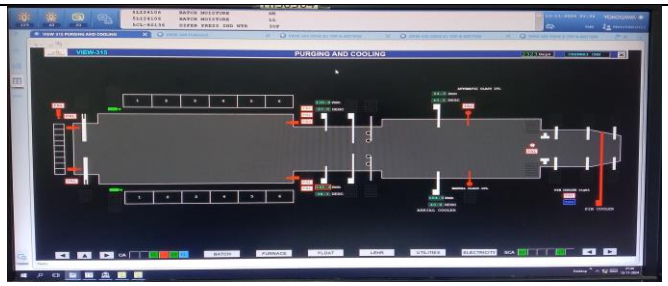
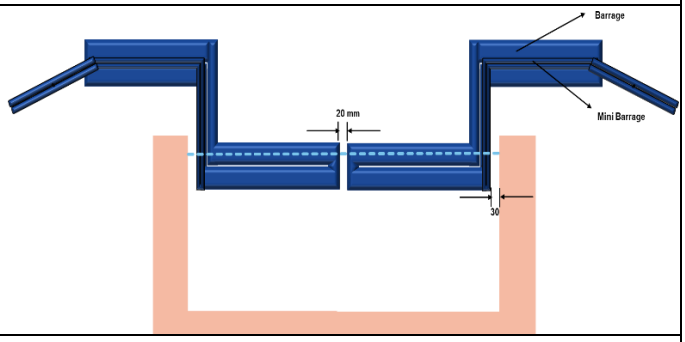
SAINT-GOBAIN	STANDARD OPERATING PROCEDURE	Doc. No: SGC-FL5-BF-SOP-08
		Rev.No: 03
	BARRAGE COOLER INSERTION & REMOVAL	Date: 4/06/2025
		Page 1 of 6

1.0 Scope	2.0 Resource Required
1.1 Purpose: The barrage is a water-cooled jacket inserted from both sides in the neck of furnace. The barrage is used for the glass making process. **1.2 Area of Application:** Neck **1.3 Responsibility:** Shift engineer & Manager/team members of hot end/Functional team	**2.1 Man:** Furnace Shift & Functional Team **2.2 Machine :** Barrage **2.3 Material:** The equipment consists of a movable trolley with facility to lower and lift it. There are three sizes of Barrage available (350- and 450-mm, 500 mm height) They are used based on the pull and tint.
3.0 Terms and Definition	**4.0 Key Performance Requirements**
3.1 Water flow **3.2** Water temperature **3.3** Barrage body temperature	**4.1 Quality** Inlet water temperature No leakage **4.2 EHS** No prolong heat exposure to the person. **4.3 Customer Spec/Internal requirement: SC/CC/OC – OC** ***Significant Characteristics (SC), Critical Characteristics (CC), Other Characteristics (OC)
5.0 Continual improvement – WCM Practices	**6.0 Competency Enhancement**
5.1 Refer Quick Kaizen sheet (SGC-FL5-BF-FOR-10) **5.2** Refer OPL sheet (SGC-FL5-BF-FOR-4)	**6.1** MKT2 : Furnace module

7.0 Procedure	
7.1 Sequence of Operation	
7.1.1 Two persons needed for barrage taking in or taking out & to be done very slowly. Additionally, an Electrician to be present to help in case there is problem in connection midway.	Slowly push in or out as per required during electrical motor failures
Barrage Insertion	
7.1.2 Barrage Dimensions and Welding joints to be ensured before installation. Test the Barrage trolley for upward and downward movement with the help of LCS panel remote.	Use the LCS panel for testing the Barrage movement.
7.1.3 Ensure availability of one electrical technician before barrage insertion	
7.1.4 Ensure hooter working condition by closing the inlet water valve. After hooter checking open the water valves.	Visually check the valve conditions.

	 Check the alarm is displayed in DCS Page (315) – Purging and cooling.
7.1.5 Remove the temporary Ceramic board covers for barrage opening.	Using by long hooks **Barrage ready for insertion.** 
7.1.6 Lift the barrage such that the lower portion of barrage is 50 mm above the floor of refractory opening.	Personal skill and visually check for the distance. Use the LCS panel remote for this purpose.
7.1.7 Move the barrage trolley inside the neck while guiding the flexible hoses.	Use the LCS panel remote for the Barrage movement. 
7.1.8 Ensure that the barrage trolley does not move further than the marked point in the rail.	Visually check.
7.1.9 Place the Barrage trolley from other side and ensure that distance between the two barrages inside the furnace is not more than 100 mm and not less that 50 mm.	Use the Working end peep hole to check the distance between the barrages. **Barrage kept for preheating before insertion.**

	
7.1.10 For Minimum disturbance in Glass quality, dip the barrage inside the glass within 30 Minutes.	Personal skill
7.1.11 During the immersion in glass one person must verify the immersion in glass by looking through working end peephole. The barrage body should be visible above the glass melt by 25mm.	Visual check.
7.1.12 Repeat the same on the other side. And ensure both barrage is immersed in same depth. Ensure the two barrages between gap is 20 mm.	
7.1.13 Check the cooling water flow and outlet temperature	By physical checking
Barrage Removal	
7.1.16 Remove the temporary covers	
7.1.17 Ensure power supply to the barrage.	Check in the LCS panel remote.
7.1.18 Make sure that rail guides are clean and without obstructions.	Visual check.
7.1.19 Keep the cullet collection tray ready to be put between the rails.	
7.1.20 Lift the barrage to the maximum height possible while looking at the barrage opening door. The barrage top to be clear to pass through the door opening.	Use the LCS panel remote for lifting the Barrage.
7.1.21 Guide the water-cooling hose both inlet and outlet which should not obstruct the track	Personal skill and Visual check

7.1.22 Immediately move the trolley backward and stop only when the barrage is fully out.	Personal skill and Visual check **Barrage removal starting.** 
7.1.23 Keep the cullet collection tray below the Barrage	
7.1.24 Lower down the barrage fully and close the door with ceramic boards.	Ceramic boards available on either side of the furnace 60 m level.

7.2 Special Process Requirements

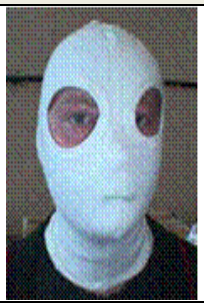
7.2.1 After barrage insertion / after barrage removal WE & PB temp will change drastically, need to adjust WE air flow accordingly.

7.3 Prevention & Detection Controls

7.3.1 Barrage water flow >50Nm3/hr. –to be checked for any flow alarm (Super critical alarm for Barrage Low flow cooling water Left & Right)
7.3.2 Barrage Water temperature – 40 to 45 deg C (Based on water temperature)
7.3.3 Barrage body temperature ~48 deg C

7.4 Controls Related to EHS

7.4.1 PPE MATRIX

				
Goggles	**Safety shoe**	**Hand gloves**	**Fleece top**	**Face hood**

8.0 EHS Compliance Obligations

8.1 *Barrage must have been hydrotested @6bar by authorized people/Vendor*
8.2 Proper PPE's adherence

9.0 Possible deviation & Impacts	10. Proposed actions
9.1 Barrage water leakage in welding points	**10.1** Barrage should be procured from DTI Authorized supplier (PEG – Projects Engineering Groups)
9.2 Water hoses getting winded up and caught up in the passage of barrage	**10.2** Water hose must be continuously guided while insertion and removal.
9.3 Stoppage of trolley while removal results in the devitrified glass falling in the glass leading to quality issues and may be shutdown.	**10.3** Do not stop the operation of removal, in the event of trolley is not coming out by motor pull it manually.
9.4 Insertion depth of Barrage may not be equal.	**10.4** Continuous inspection must be there while insertion of Barrage through the working end Peephole. And final inspection to be done after closing the barrage window with ceramic board. Through the window of barrage using the peephole point.
9.5 Crossing the limit of insertion.	**10.5** Continuous inspection must be there while insertion of Barrage through the working end Peephole.
9.6 Exposure to heat	**10.6** Use all the Heat-resistant PPE's and drink plenty of water.
9.7 Cullet generation.	**10.7** Cullet generated must be disposed to the cullet yard.
9.8 Metallic wire tied in the water hose clamp causes spark if it comes in contact with barrage.	**10.8** To avoid sparking metallic wire must be replaced by cable tie.
9.9 Barrage position after immersion not checked will lead to gap more in between the sidewall and barrage	**10.9** Scale measurement and stopper position to be checked after insertion of barrage and mini barrage

11. Reference documented information

11.1 Mini Barrage Insertion **(SGC-FL5-BF-SOP- 112)**
11.2 Barrage Operation Best Practice **(SGG-55-3414-01-D)**

12. Revision History

Revision No.	Date	Description of changes

00	8.6.2018	New format	
01	25/07/2023	QCP Changed with CC/SC/OC	
02	23/01/2024	Barrage procurement supplier defined	
03	4/6/2025	General revision done	
	Prepared By	Reviewed By	Approved By
Name	Divya D	Sandeep Kumar Dogga	Kesavan D
Designation	Team member- Batch & Furnace	TM/TL Batch & Furnace	Team Leader – Hot end
Date	4/6/2025	4/6/2025	4/6/2025