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| **ER5C Pair Processing Steps** | | | |
| **Document Number:** | ER5C-PR-WCA-CPR-PROC | **Effective Date:** | DD Apr 2025 |
| **Revision Number:** | 1 | **Periodic Review Date:** | N/A |
| **Document Owner:** | Christiana Wilson | **Department Owner:** | SRF Operations |

# Purpose and Scope

The purpose of this document is to provide a high-level overview of ER5C cavity pair qualification. It lists the steps to process the ER5C cavities from receipt to handover as a cavity pair to the cryomodule group.

# Definitions and Diagrams

The following terms have specific meanings within this procedure.

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| **Term** | **Definition** |
| HEP | Horizontal Electropolish |
| USC | Ultrasonic Rinsing |
| HPR | High Pressure Rinse |
| VTA | Vertical Testing Area |
| RF | Radiofrequency |
| CMM | Coordinate Measuring Machine |
| BCP/HF | Buffered Chemical Polish / Hydrofluoric Acid |

# Roles and Responsibilities

The following roles have responsibilities described in this document.

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| **Role** | **Responsibility** |
| SRF Ops Staff | Perform work according to approved procedures, document work performed in Travelers or other locations as appropriate. |
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# Safety

The individual must keep safety as the first priority in the process; before beginning any job, the user

must assure they have the correct PPE for the individual job. Maintaining the level of safety and secure

nature of the work area is paramount. Assure personal safety by using caution in movement and taking

necessary steps to avoid unnecessary personnel in the immediate area

# Procedure (Traveler ID)

1. Initial Fabrication (ER5C-CAV-FAB)

INITIAL INSPECTION

1. Optical Inspection (ER5C-INSP-CAV-OPTK)
2. Initial RF Inspection (ER5C-TUNE-CAV)
3. CMM Cavity Receipt Inspection (ER5C-INSP-CAV)

CHEMESTRY AND HEAT TREATMENT

1. Initial Thickness Measurement (ER5C-CHEM-CAV-THICK)
2. HEP (ER5C-CHEM-CAV-HEP)
3. Ethanol Rinse inside of cavity (ER5C-CHEM-CAV-DEGR)
4. USC Rinse (ER5C-CHEM-CAV-DEGR)
5. Thickness Measurement (ER5C-CHEM-CAV-THICK)
6. Heat Treatment (ER5C-FURN-CAV-HEAT)
7. HEP (ER5C-CHEM-CAV-HEP)
8. Ethanol Rinse inside of cavity (ER5C-CHEM-CAV-DEGR)
9. USC Rinse (ER5C-CHEM-CAV-DEGR)
10. Thickness Measurement (ER5C-CHEM-CAV-THICK)

POST CHEMESTRY

1. RF Tune, set probes, RF meas. (ER5C-TUNE-CAV)
2. CMM post processing and flange Inspection (ER5C-INSP-CAV)
3. Flange Lapping (ER5C-CHEM-CAV-FLAP)
4. Flange BCP/HF (ER5C-CHEM-FLNG-BCP)
5. USC Rinse (ER5C-CHEM-CAV-DEGR)
6. Final Inspection (ER5C-INSP-CAV)

PAIR ASSEMBLY

1. USC multiple passes (ER5C-CHEM-CAV-DEGR)
2. HPR multiple passes with or without ozone (ER5C-CHEM-CAV-HPR)
3. First-Assembly, attach load and elbow to cavity (ER5C-CLNRM-CPR-ASSY)
4. HPR multiple passes with or without ozone (ER5C-CHEM-CAV-HPR)
5. Final-Assembly, attach doglegs and pair cavities (ER5C-CLNRM-CPR-ASSY)
6. Leak Check pair on pump cart. (ER5C-CLNRM-CPR-EVAC)
7. Plasma Process (ER5C-VTA-CAV-PLSM)
8. Final-Assembly, transfer to test stand and leak test (ER5C-CLNRM-CPR-TSTD)

VTA

1. Warm Dewar Leak Check (ER5C-VTA-CPR-LEAKW)
2. Cavity pair cool down (ER5C-VTA-CPR-COOL)
3. VTA High Power RF Test (ER5C-VTA-CPR-VTRF)
4. Desorption Leak Test (ER5C-VTA-CPR-LEAKD)

# References

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| **Document No.** | **Title** |
| SRF-06-PR-001 | Records Management Procedure |
| SRF-07-PR-001 | Document Management Procedure |
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# Release and Revision History

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| --- | --- | --- |
| **Rev #** | **Major Changes** | **Revision Date:** |
| 1 | Initial version (Utilizing SRF-07-FM-005 SRF OPS Procedure Template, R1) | DD Apr 2025 |
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# Approvals

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| Document Owner | C. Wilson |
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* *Put valid dates everywhere DD is found and verify they are accurate*
* *Attach DocuShare Approval Picture here*