

FCAL1 Process Sheet

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Process Spec: 1.3.3.1.1.2-4 – Tube Cleaning^{cont'd}

Process (continued):

5. Place the matrix with tubes in tank 1, which is filled with warm (66°C) 5% LPS solution, and activate ultrasonic transducer timer for 40 minutes. *Check solution with Ph meter to assure reading is above 11.6 before each load.*
6. Remove cleaning matrix with tubes from LPS bath and place in tank 2, a rinse vat filled with clear water. Agitate the cleaning matrix (up and down motion) 6 times to completely flush water through tubes.
7. Place matrix with tubes in tank 3, which is filled with warm (66°C) 2% Citranox solution, and activate ultrasonic timer for 40 minutes. *Check solution with Ph meter to assure reading is below 2.5 before each load.*
8. Remove cleaning matrix with tubes from Citranox bath and place in tank 4, a rinse vat filled with FD water. Agitate the cleaning matrix (up and down motion) 6 times to completely flush FD water through tubes. *Check FD water with conductivity meter to assure conductivity of 1 µS or less.*
9. Remove cleaning matrix with tubes from tank 4 and place in tank 5, a pre-drying vat filled with isopropyl alcohol. Agitate the cleaning matrix (up and down motion) 6 times as before. Remove matrix with tubes from tank 5 to the lab bench behind tank farm.
10. Give a blast of nitrogen down each tube (while still in matrix) and blow liquid from outside of the tubes and cleaning matrix.
11. Perform QC check as outlined in Quality Control of Copper Tube Cleaning Process Specification [1.3.3.1.1.2-5](#).
12. Place the cleaning matrix with tubes on drying bench (large cart) in the clean room.

Remarks:

- If Ph readings are not within required range more solution must be added until desired Ph reading is obtained.
- The FD water in the second rinse vat must be replaced if its conductivity is higher than 1 µS (micro-Siemens).

Global Process: [1.3.3.1.1.2](#) – Tube Processing

Previous: [1.3.3.1.1.2-3](#) – Tube De-burring Inspection

Follow-Up: [1.3.3.1.1.2-5](#) – Tube Cleaning Inspection