Preparation procedure in TTF3-SLAC/FNAL couplers

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Acknowledgment:
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Preparation procedure in TTF3-SLAC/FNAL couplers

Process flow

- Receiving
  - Couplers are shipped to SLAC from CPI backfilled with dry nitrogen gas
  - Couplers are moved into class 10000 clean room for metrology
- Incoming metrology
  - Point by point inspection is performed using standardized metrology report
  - Defective areas are documented and photographed
  - 100% interior surface video
- Cleaning
  - Bellows exercise (cold ends only) +/- 5mm
  - Couplers are moved to class 100 and class 10 clean room
  - Couplers are cleaned for 15 minutes in ultrasonic bath with liquid detergent
  - Couplers are rinsed with ultra pure water
  - Couplers blown dry with Nitrogen gas, considered clean when particle counts are below 10
- RF Conditioning
  - Couplers are assembled onto the test stand in the class 10 clean room
  - Leak check, move to RF conditioning area
  - Couplers are RF conditioned and processed
- Couplers are packaged and shipped to FNAL
  - Hardware packaged per ILC shipper
  - Colds double bagged and shipped on CPC stands
  - Warms bagged and purged with Nitrogen

Preparation procedure in TTF3-SLAC/FNAL couplers
Metrology

- Incoming metrology
  - Work done inside cleanroom
  - Visual inspection of internal and external surfaces.
  - Geometry and clocking are checked.
  - Point by point inspection is performed using standardized metrology report.
  - Defective areas are documented and photographed.
  - 100% interior surface video
  - Bellows exercise (cold ends only)

Preparation procedure in TTF3-SLAC/FNAL couplers
Cleaning

- Cleaning
  - Couplers are moved to class 100 and class 10 clean room
  - Couplers are cleaned for 15 minutes in ultrasonic bath with liquid detergent
  - Ultrasonic cleaning is done per SLAC spec “Ultrasonic Bath Cleaning Process”
    - 50 degrees C
    - “Liquid-Nox” cleaning agent
    - Process 15 minutes, Power setting 5, sweep mode 40KHz +/- 2KHz
    - Move to rinse tank
  - Couplers are rinsed with ultra pure water until resistivity meter reads < 100
  - 5 minutes extra rinse time added
  - Rinse with filtered ethyl alcohol to displace water
  - Couplers blown dry with Nitrogen
  - Move to class 10, leave overnight to dry completely
  - Blown with ionized Nitrogen until particle count < 10
  - Ready for mounting on processing stand or packaging for shipment

Preparation procedure in TTF3-SLAC/FNAL couplers
Issues

- Metrology process
  - 100% video of interior plating surfaces? Does anyone do this?
  - What criteria is used for visual inspection of plating, what acceptance criteria?
- Ultrasonic cleaning
  - Is it too aggressive to plated surfaces? Copper is removed continuously.
  - Measurements indicate that power levels vary greatly by location inside tank
  - What is an appropriate time and power level?
  - Extra rinse time to assure removal of particles, does anyone do this?
  - Bellows exercise to help loosen particles, is it needed?
- Leak check prior to coupler RF processing
  - Discussion: What are desirable leak check procedures (MLD, ultimate vacuum, bag or no bag etc.)
  - Why? FNAL detected a leak in a cold that was not detected at SLAC.
  - The leak check spec on the DESY drawings is very relax (1.0 x 10^-9 mbar x liter / second), is this acceptable?