

# STF Plan of gradient improvement

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# STF infra-structure for cavity

(1) EP facility construction was almost over.

No.1 EP bed for 1.3GHz

No.2 EP bed is only for 500MHz (1.3GHz will be prepared next year.)

\*HPR, clean room, annealing are operational

(2) Vertical Test facility construction was almost over.

No.1 cryostat is operational

No.2 cryostat is under construction for He pumping connection

(3) Pre-tuning machine

Manual pre-tuning machine is operational

Automated pre-tuning machine will come soon.

(4) Cavity inspection machine

Two machines are operational

(5) Local grinding machine

Two grinding machines are operational

(6) cavity fabrication facility

under construction, will be ready in the next year.

(7) Surface study facility

Laboratory-EP, Field emission scanner, soon will be available.

SEM, XPS, SIMS, XRF etc are in operation.

# Gradient Improvement effort and plan (1)

## Quench by defect

### (1) Cavity fabrication feedback

- Put all the information of quench by defect to fabrication companies.
- Put inspection procedure in the fabrication process.
- Put grinding procedure in the fabrication process.

### (2) Inspection and repair by local grinding after bulk-EP

- Collecting data for quench-defect correlation using replica-method.
- Collecting demonstration example of successful local grinding.
- Try to understand them by field enhancement calculation.
- Improvement of local grinder machine.
- Improvement of replica-method.
- Improvement of inspection camera.

# Gradient Improvement effort and plan (2)

## Quench by field emission

### (1) Identify the source of field emission

- Collecting data for field emission source by using T-map, X-ray map and dose-meter.
- Collecting data for correlation with surface process parameter.
- Collecting data for correlation with surface stains.

### (2) Optimization of EP treatment

- Collecting data for EP surface residuals using XPS, SEM, TOF-SIMS, etc.
- Accumulating data of EP acid constituent and impurities along aging.
- Accumulating data of impurities in rinse-washout water by XRF.
- Improvement of rinse procedure not to have any stains.
- Improvement of EP parameter not to have any residuals.
- Installing many monitors (temp., chemicals, etc) to characterize the best EP.
- Development of wipe-off procedure for surface residuals.
- Development of field-emission scanner for coupon sample.
- (Development of in-situ field emitter finder for 9-cell cavity; just an idea.)
- Improvement of clean-room assembly work.