

- This work was supported by MEST of Korean Government.
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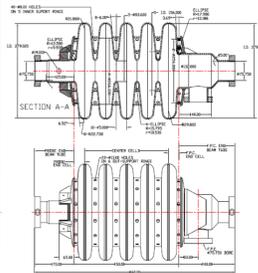
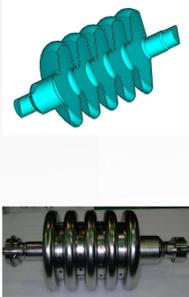
## Introduction to the PEFP Low-Beta SRF Prototype Cavity

### 1GeV Extension Plan

Parameter	Value
Beam Energy	100 MeV to 1 GeV
Peak Current	20 mA
Beam Duty	5 %
Beam Power	1 MW
RF Source	150 kW IOT
Cavity type	0.50/0.74, Elliptical
Focusing	SC Solenoid

### Prototype Cavity

Parameter	Five-cell type
Frequency [MHz]	700
Geometrical beta	0.42
Eacc [MV/m] @2.0K	8.0
Operating Temperature [K]	2.0
Intrinsic Q	5.0E09
Cavity length [m]	0.86
Effective length [m]	0.45



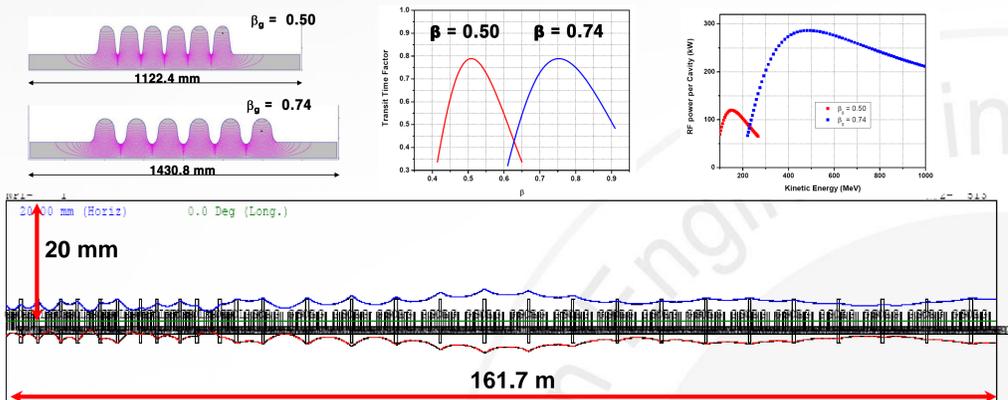
Engineering Design



Half Cell Machining



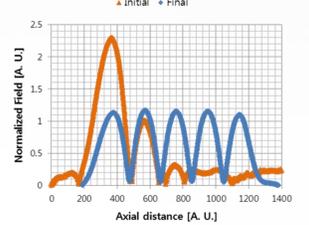
EB Welding



Field Flatness Tuning

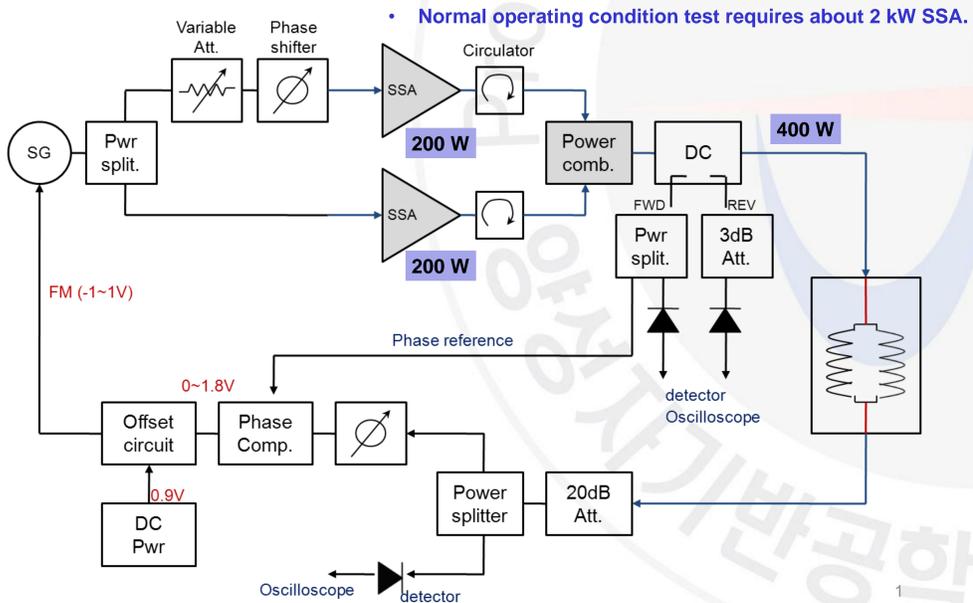


Surface Treatment (BCP with 1:1:2 & HPR)

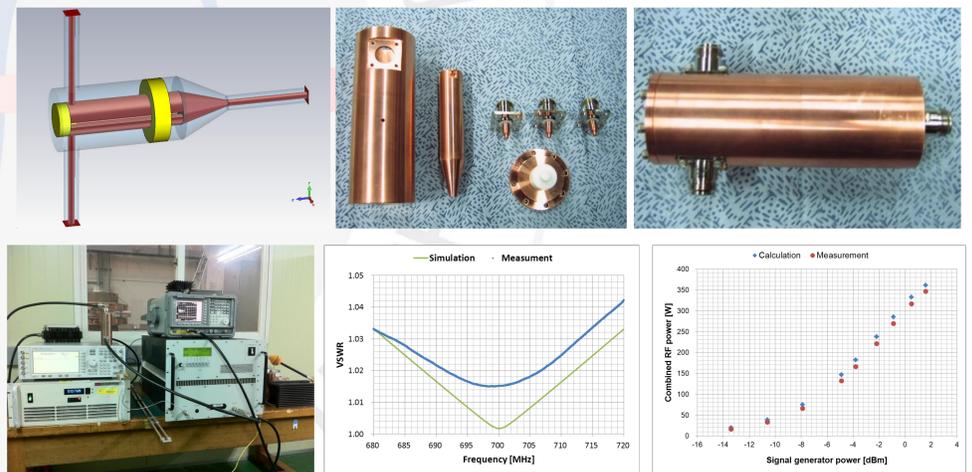


Field Flatness : ~2%

## RF System for Vertical Test

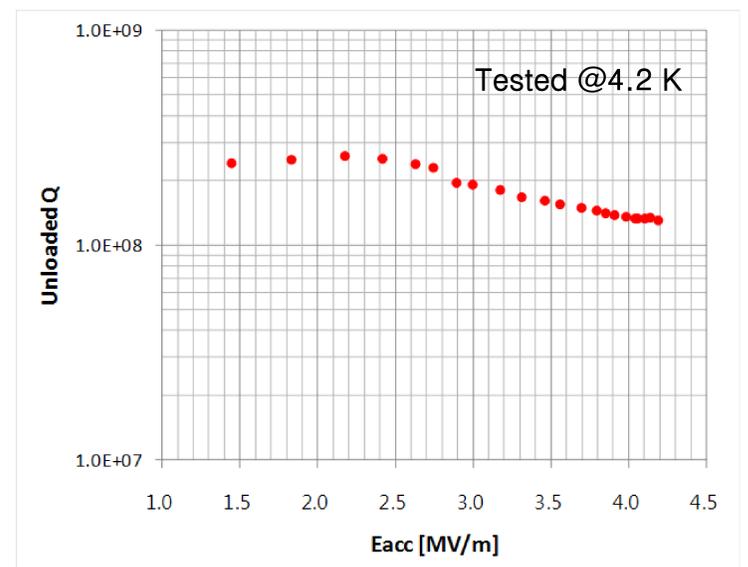
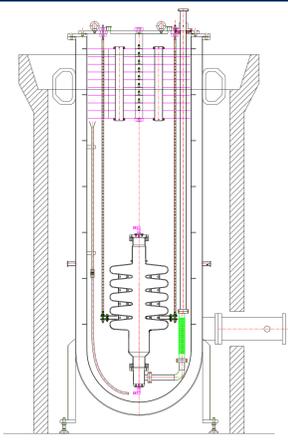


## Split Coaxial RF Power Combiner



- S11 : better than -35 dB (Good matching), BW : ±20 MHz @VSWR1.05
- Amplitude balance : better than 0.06 dB
- Phase balance : better than 0.3 degree

## Vertical Test Results of the PEFP SRF Prototype Cavity



## Summary

- Prototype cavity for PEFP was tested.
- $Q_0 \sim 2.9E8$  @4.2K,  $E_{acc} \sim 4.2$  MV/m @330W