Cavity Fabrication in CFF/KEK and its pressure vessel certification

This information provided by Eiji Kako,for this workshop at CERN, 5 Sept., referring a presentation given by T. Saeki et al., at the TTC meeting at Jlab, 5- 8 November, 2012.

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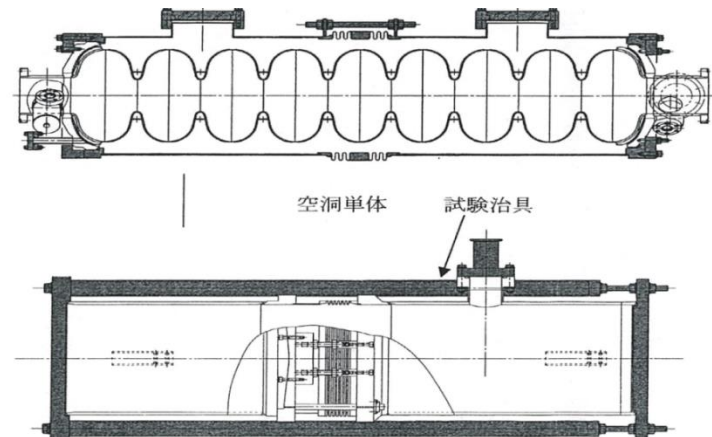
Japanese High-Pressure Gas code regulation

We must fabricate cavities complying with Japanese High-Pressure Gas (PHG) code if we use the cavities in cryomodule.

Ti

Ti

Ti

Ti

NbTi

Nb

Design = TESLA-like KEK-type

NbTi
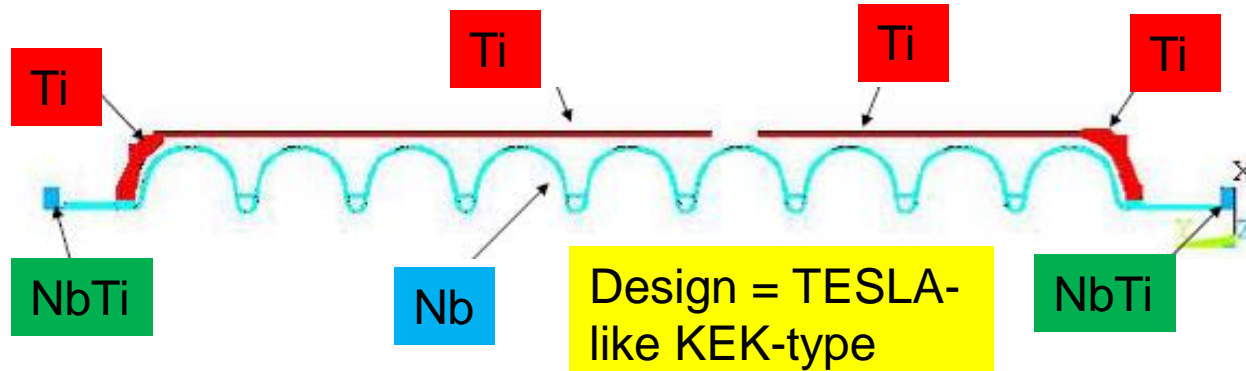
We must confirm the strength of liquid-He pressure-vessel by analysis with simulation and declare the welding details of Nb cavity and Ti jacket to the authority. In addition, we must perform series of pressure tests and report the results to the authority.
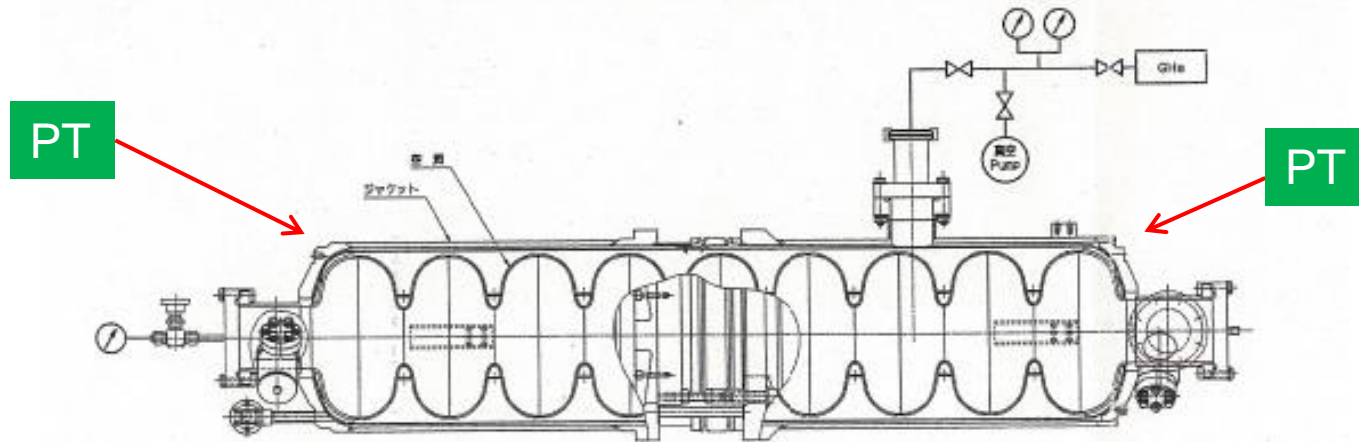
(Step-1)Bare 9-cell cavity（pressure-test with water)

(Step-2)Only He jacket (pressure-test with water)

空洞単体　　　　試験治具

Japanese High-Pressure Gas code regulation

(Step-3)9-cell cavity with welded He jacket（Pressure-test with gas and liquid penetrant test (PT) along welding seams between cavity and He jacket)

PT

PT

All the HPG-code process of past STF cavities had been done by the cavity vendor. But we (KEK/CFF) are trying to do the HPG process of KEK/CFF cavities by ourselves.

For realization of ILC, we need more cavity-vendors in Japan. In addition, in case of ILC in Japan, 2/3 of cavities might be imported from foreign vendors. If we (KEK/CFF) have the experience of HPG-code process, KEK/CFF can guide new and/or foreign vendors for the Japanese HPG-code process.
Also if KEK/CFF controls the HPG-code process, the cavity cost might be reduced.