

R&D of Ti-SUS Joint

KEK

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- We have been developing Ti-SUS316L Joint for the 35 MV/m cavities since their He jackets are made of Ti.
- Up to the present date, two bonding methods were examined:
 - (1) friction welding method
 - optimum welding method
 - (2) HIP (Hot Isostatic Pressing) method
 - choice of insertion metal
 - optimum HIP condition
- **Tensile tests** at 300 K and 80 K and **Charpy impact strength tests** at 300 K and 80 K were performed.



Friction welding sample
after the tensile test



No.1



No.2

HIP

No distinct differences of the tensile strength were found.

Test results

		Tensile strength (Mpa)	Charpy strength (J/cm ²)
HIP	300K	>480	~10
HIP	80K	>700	~5
Ti	300K	~490	~29
Ti	80K	~900	~32

- For STF-1, fourteen joints were fabricated.
 - 70 mm dia. X 7 pieces (incl. spares)
 - 30 mm dia. X 7 pieces

Test samples were made using one joint and tensile test and Charpy test were performed.

The test results were almost the same as those of previous samples.

- All pipe-shaped joints were leak tested at 2K and confirmed the leak tightness.
- Currently, two joints have been installed into STF-0.5 cryomodule and waiting the cool-down test.

