



Electron beam welding for cavity production, cooperation with KEK on internal welding of 1.3GHz type cavities

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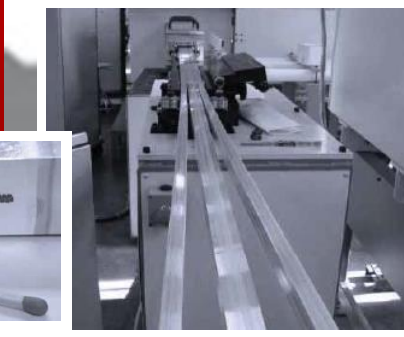


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2003 Crystal Award of the year

Accredited Training Centre for EB welding. Usage and maintenance of welding machines

More than 400 machines all over the world

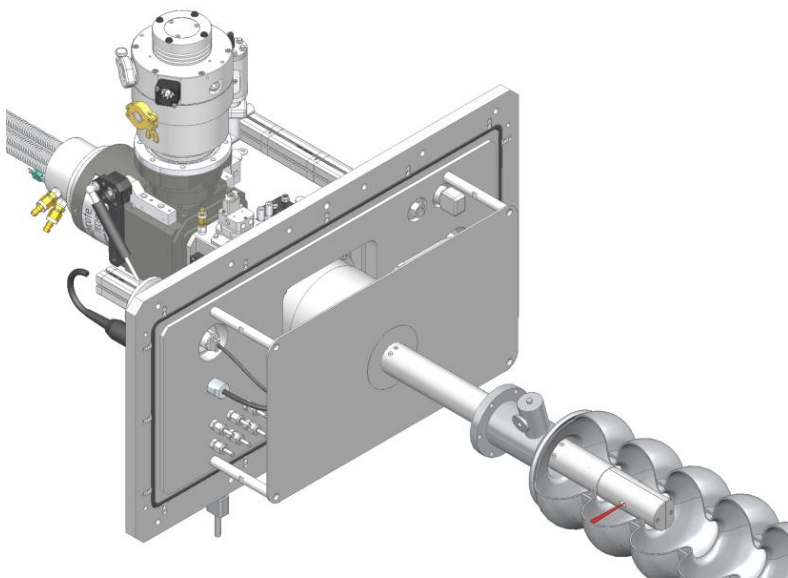
Upgrading old welding machines from any Suppliers

Many tools for weld inspection (X-ray, eddy current, ultrasounds, penetrant testing)



Special Tools for Inside 1.3Ghz Cavity welding

TECHBEND



Small Diameter Tool D57 for 90° Inside Welding

- Mastering of Beam Density Distribution
- Reproducible Beam Settings

TECHSCAN



Beam Analysis after 90° Beam Bending

- New welding approach => Weld Process Improvements
- Guarantee for Identical Welds



KEK - TECHMETA cooperation since end 2019

Cooperation for:

- Realisation of Equator & Iris seams by inside welding
- Realisation of complete SCRF cavity
- Realisation of a 1-cell, Tesla-like cavity of KEK design
- Cryo test in real conditions for evaluating the RF performance

Final objectifs:

- Proof of Interest of Inside Iris & Equator Welding
- Process Proposition for cost reduction



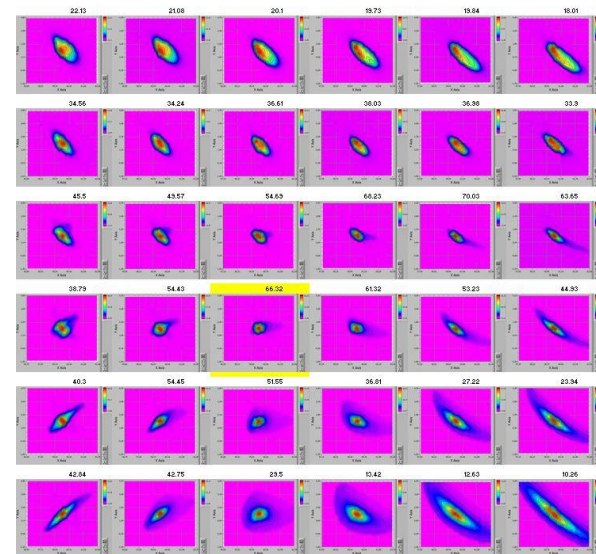
Cooperation in Progress:

KEK :

- Niobium cylinder (samples) provided (for Ebeam Set Up)

Techmeta :

- Tool modification for Iris weld:
 - Heat management
 - Metallisation management
- 90° Beam Density Distribution Scans
- Tool validation on Stainless Steel Samples, D_{int} 60mm



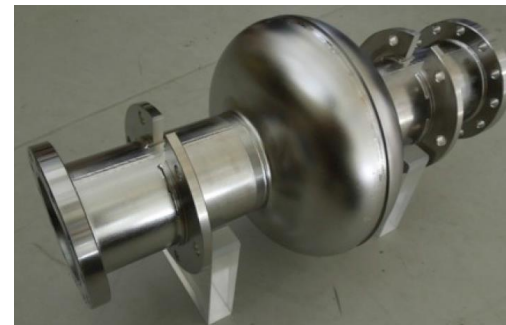


Cooperation in Progress:

Techmeta :

- Tool validation for D_{int} 60mm
Stainless Steel Samples
- TechBend Inside weld set-up





Cooperation Steps for 2020:

KEK :

- 1 cell Tesla-like (Type Cavity) parts preparation

Techmeta :

- Parameter Set Up – Slope In / Weld / Slope Out
- Parameter Optimisation on Niobium cylinders
- Special Dedicated Weld Equipment under construction
- Fixture Design & Realisation
- Inside Welding of 1.3GHz 1 cell Tesla-like Type Cavity

KEK :

- Welded Cavity surface preparation (EP etc.) for Cryo Test
- Cryo Test and RF performance measurements



Resume:

KEK – TECHMETA cooperation started

TechBend and TechScan permit new cavity weld approach

TechBend ready for Iris weld conditions

Conditions united for search of optimal parameters

To conclude:

2020 → The first 1.3GHz cavity through Inside Welding ?

2020 → A new approach to 1.3GHz cavity welding

Thank you for your attention

... at your disposition for any question

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'Simplicity is complexity resolved' – C. Brancusi