

Development for mass-production of cavity at MHI

WG4 “Cavity Fabrication and Preparation”

- Development histories
- Increasing production Line
 - Using Laser Beam Welding
- Reducing the number of parts
 - Seamless dumbbell
 - Unification of monitor port and flange
- Batch Process

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MITSUBISHI HEAVY INDUSTRIES, LTD.

*H.Hara , K.Sennyu , T.Tsuiki , T.Yanagisawa , K.Okihira , K.Kanaoka

1. Development histories

Phase	Cavity No.	Welding process for stiffener	Welding process for baseplate	Number of the cavity for final welding per 1 chamber	New process
R&D	MHI-A 9cell	LBW	EBW	1	
	MHI-B 2cell	-	-	1	Seamless dumbbell
	MHI-C 9cell	LBW	LBW	1	9seam / 1batch
	MHI-D 9cell	LBW	EBW	1 +3 dummy	Unification of monitor port and flange
STF 2-a	#23-26	LBW	EBW	2	Using retainer ring for monitor port
STF 2-b	#27-30	LBW	EBW	4	

2. Increasing production line

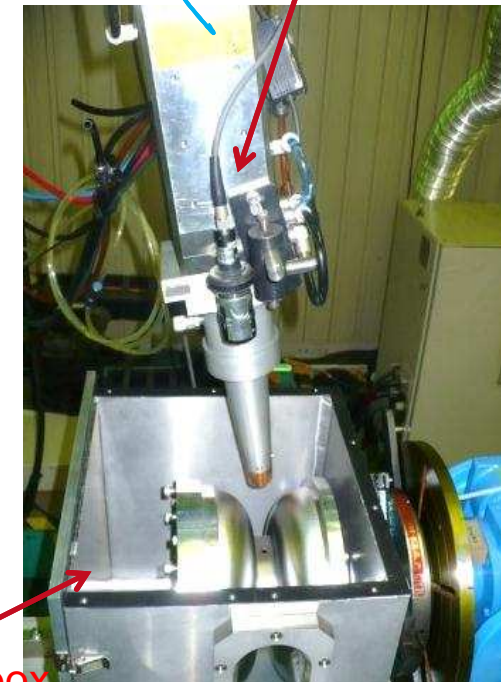
Laser can be divided by beam switch to multi station through fiber

Beam switch



Oscillator

Optical laser head



Shield gas box

Welding station

3. Reducing the number of parts~Seamless dumbbell



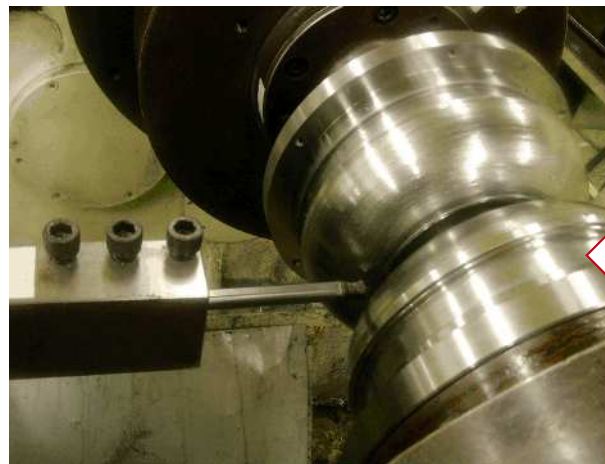
Deep drawing from sheet



Set of pipe



Spinning



Turning for stiffner

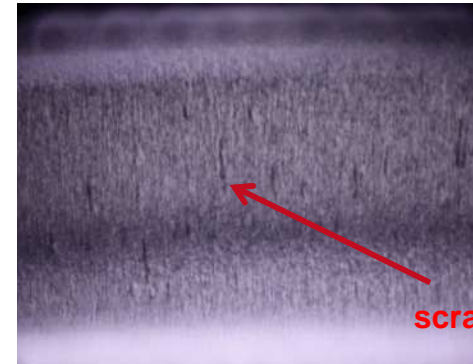


Turning for thinning of equator

3. Reducing the number of parts~Seamless dumbbell



BCP 140μm

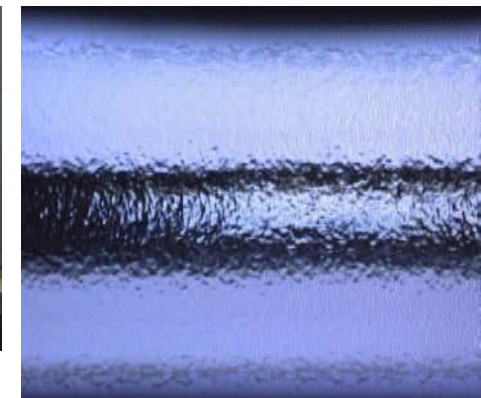


scratch

Inner surface of seamless iris

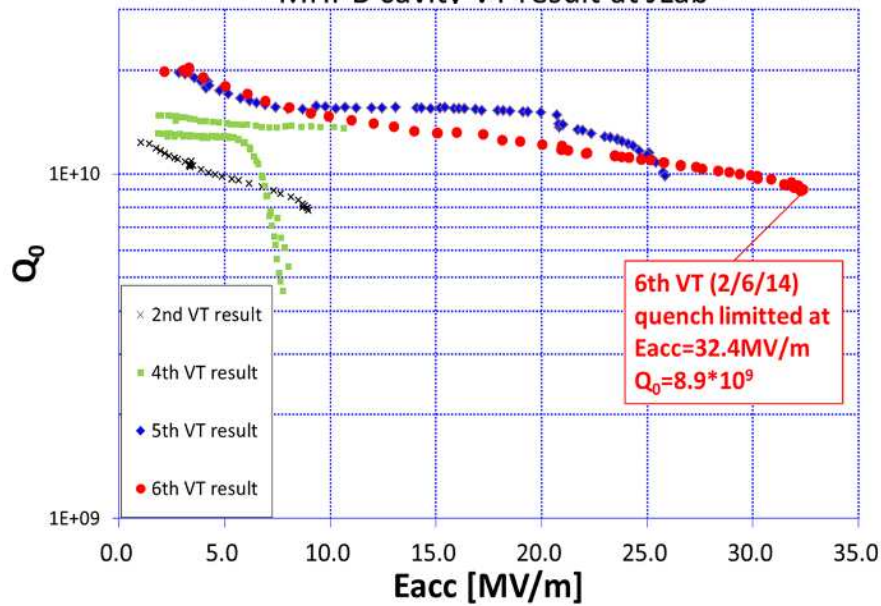


EP 30μm

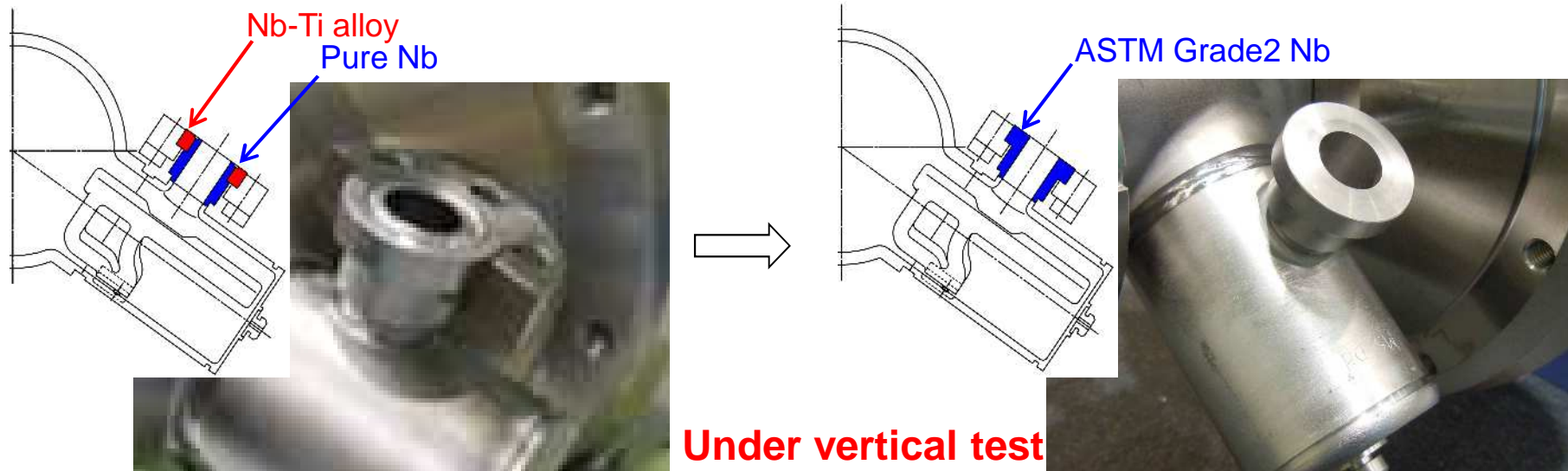


Inner surface of seamless iris

MHI-B cavity VT result at JLab



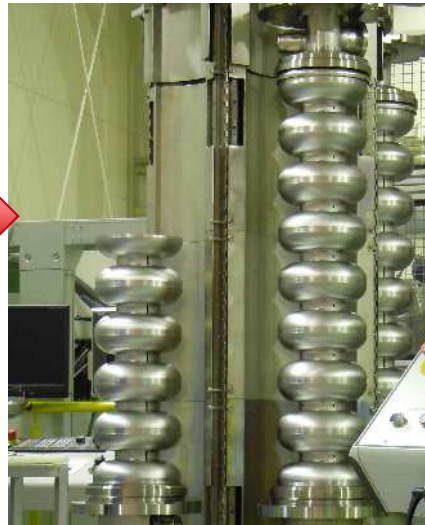
3. Reducing the number of parts~Unification of parts



3. Batch Process



4 sets of Cavity parts



Assembling process



Before welding



Under vertical test



After welding

Thank you for your attention !



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