#### 2018 Briefing Session on ITER/BA

# The effort of MTC in Divertor development and prospect of related technology

# December 14, 2018 Metal Technology Co. Ltd. Eegineerlig Divison

# ♪ The effort of MTC in Divertor development



and prospect of related technology



- **1** Activity of manufacturing and development
  - Manufacturing of divertor cassette for JT-60SA
  - Development of brazing technique for CFC mono-block Divertor
- 2 Activity of analysis and design
  - Analysis of electromagnetic force for JT-60SA -Conceptual study for DEMO
- **3 Prospect in industrial application** of technology for nuclear fusion

-Utilization of dissimilar joint technique by HIP

-Non-destructive inspection using neutron beam

-Small electron accelerator Micro Tron / MIC 1

# Metal Technology Co. Ltd. Eegineerlig Divison

the metal solution?



# Activity in manufacturing and development

#### ΜΤϹ



#### Manufacturing of Divertor Cassette for JT-60SA MTC



#### Development of joining procedure for in-vessel cooling pipe by laser welding

Laser

D 54

Lens

Mirror

Positioning

censer

Setting of DVT cassette and joining of cooling pipe in vacuum vessel



#### Laser welding of cooling pipe in DVT cassette Joint positioning procedure



Target tolerance for joint ±0.3mm



LED

Nozzle for gas

#### Development of blazing technique for CFC mono-block divertor



φ19

CPU PROMINENTARY, CT-4, SPACE AL OFFICIAL TO B. OTTO REP. TO GAL DECEMBER PROF. TO B.

## Study of improved concept for CFC mono-block divertor



3/4インチ\



Typical issue in the future : Joining technique for tungsten coated CFC mono-block

## Mono-Block Structure & heat sink Structure of JT-60SA



Sealing of the end of the treaded hole

#### Analysis of electromagnetic stress for divertor cassette of JT-60SA





m

## Conceptual study for DEMO as BA DEMO design team



For study of conceptual design for DEMO divertor **Elastic-plastic analysis** 

the metol solution'

# Example of utilization of dissimilar joint technique



#### **Cooling pipe for ITER TF coil structure**



#### Mock up for cooling performance estimation of Cooling pipe of ITER TF coil structure



# Medical application as Target for accelerator / B N C T



## Small electron accelerator – 「Micro Tron / MIC 1」







# Thank you very much for your attention.

