

# Current Status of Final Design and R&D for ITER Blanket Shield Blocks in Korea

- The blanket shield block (SB) is one of the most important components to ensure a safe and reliable plasma operation. The conceptual, preliminary and final design reviews have been completed in the framework of Blanket Integrated Product Team (BIPT). Korea domestic agency (KODA) has been successfully completed the final design activities including thermo-hydraulic and thermo-mechanical analyses for SB #2, #6, #8 and #16.
- The cooling channel design of SB #2 and #6 were satisfied the design requirements with comparative ease, because those are located on in-board region of Tokamak and under relatively moderate nuclear heating load.
- The SB #8 which is one of the most difficult modules to design a cooling configuration got reached the design requirement with application of NB shine-through module concept and cover plates with 8 mm thickness.
- For the cooling channel design of SB #16, many cooling headers on front region were inserted to mitigate a peak stress nearby the access hole and radial slit end hole, in the early design stage. Eventually, only a few cooling headers have been remained by the effort through several iterations to remove them and to optimize the cooling configuration.

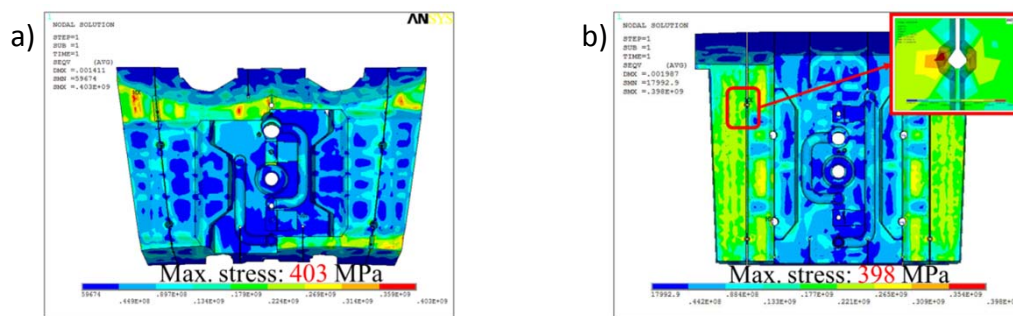


Fig. 1 Final modification result for a) SB#8 and b) #16

- Several R&D activities were implemented to resolve the fabrication issues prior to manufacture the SB #8 FSP. 316L(N)-IG forged steel was successfully fabricated and qualified in accordance with the technical specifications. The conventional fabrication techniques such as cutting, milling, drilling and welding were applied for the manufacturing of the SB #8 FSP. All of the tests such as visual & dimensional inspection, NDE, hydraulic pressure test and hot He leak test was carried out and met the acceptance criteria.



Fig. 2 Overall machining processes for manufacturing of the SB #8 FSP