

7 Outstanding Features →

The ACE7 fuel have seven outstanding benefits against the currently used fuel, which include thermal margin increase of greater than 10% in power, high burnup capability of 55,000 MWD/MTU(batch average), neutron economy enhancement, reduced fretting wear susceptibility, preventing fuel assembly bowing, integral clamp top nozzle eliminating potential loose part, and enhanced debris filtering efficiency

01 Enhancing Thermal Margin

The grid mixing vanes have been optimized with additional intermediate flow mixers. The CHF tests showed thermal margin increase of greater than 10% in power.

02 Achieving High Burnup Capability

To achieve high burnup capability of 55,000MWD/MTU(batch average), the dimensions of the fuel assembly and the fuel rod have been optimized and an advanced Zr-Nb alloy has been selected. The extensive fuel performance analyses indicate that the ACE7 fuel will meet the target burnup.

03 Improving Neutron Economy

Neutron economy has been increased with the optimized fuel rod diameter and the introduction of axial blankets at both ends of the pellet region.

04 Reducing Grid-to-Rod Fretting Wear Susceptibility

The mid-grid has vertical I-shaped spring and widened dimple to increase contact area between fuel rod and spring, which will reduce fretting wear susceptibility.

05 Preventing Fuel Assembly Bowing

The guide thimble tube is straight and tube-in-tube type to prevent fuel assembly bowing and incomplete RCCA insertion, while currently used fuels have swaged guide thimble tube as a dashpot.

06 Integral Clamp Top Nozzle

The top nozzle holddown springs are retained within the integrated nozzle and clamp casting to eliminate potential loose part of spring screws.

07 Increasing Debris Filtering Efficiency

The protective grid is used in conjunction with small hole bottom nozzle to filter debris efficiently as well as to support fuel rod against fretting wear-induced fuel failure.

ACE7TM

Advanced Fuel for Westinghouse Type Plants

KEPCO NF's ACE7 fuel, designed to replace WH type fuel, has been developed to meet the enhanced performance and reliability needs of utilities for future use. The ACE7 is fully compatible with reactor internals, handling equipments, other core components and resident fuels.



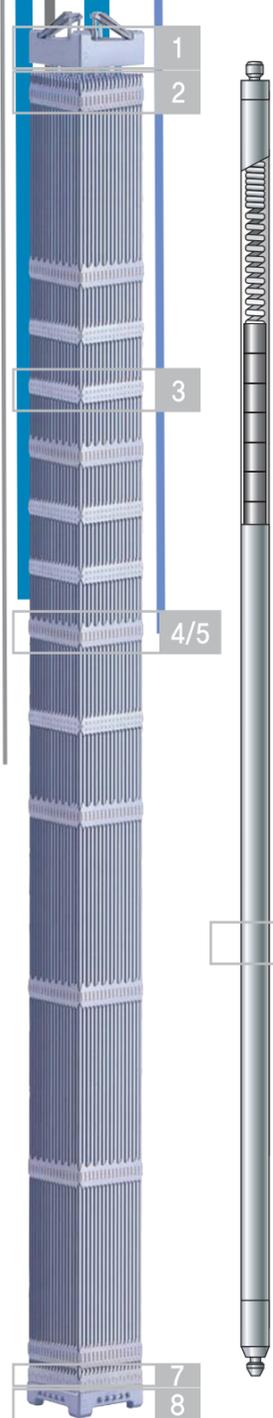
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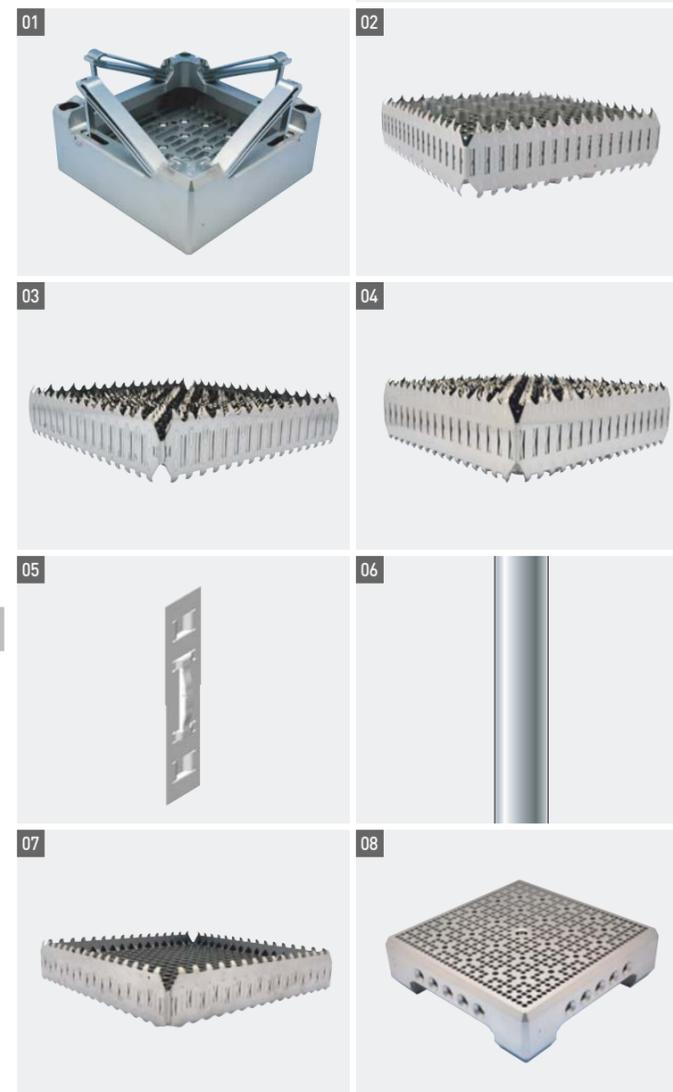


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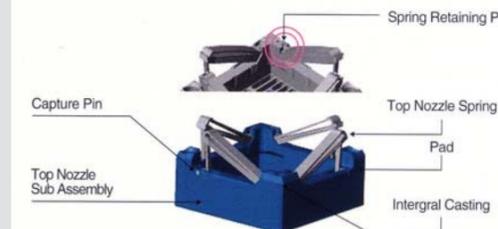


- 01 | Integral Clamp Top Nozzle
- 02 | High Burnup Inconel Grid
- 03 | Intermediate Flow Mixing Grid
- 04 | High Strength Mid Grid
- 05 | I-shaped Grid spring
- 06 | High Burnup Fuel Rod
- 07 | Protective Grid for Debris Filtering
- 08 | Debris Filtering Bottom Nozzle



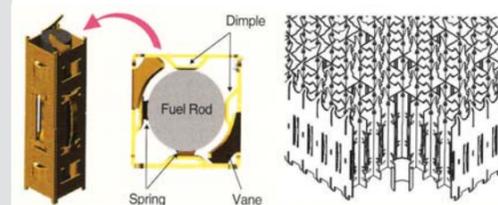
Integral Clamp Top Nozzle

- Elimination of potential loose part.
- Spring clamps and top nozzle consist of one casting to prevent spring screw cracking problem.
- Top nozzle and guide tubes are attached by lock tube for easy assembling and disassembling.



Vertical I-Shaped Spring Mid Grid

- Increased fretting wear margin.
- I-shaped grid spring geometries increase contact area as irradiation exposure.
- The large contact area of spring & dimple improves fuel rod fretting wear resistance.



Debris Filtering Bottom Nozzle

- Features in ACE7 fuel provide multi-protection against debris-induced fuel rod damage.
- Debris-filter bottom nozzle(DFBN) traps most debris before it enters the fuel assembly.
- The next line of defense is provided by solid end plugs and a protective grid located on the DFBN.

