

FUEL FABRICATION

Nuclear fuel fabrication converts the enriched UF_6 into fuel for Nuclear power reactors. Nuclear fuels are in the form of ceramic pellets.

ceramic pellets

Enriched uranium Hexafluoride converted in to uranium dioxide UO_2 powder. This powder processed into pellets form. These pellets are fired in a high temperature sintering furnace. In this sintering furnace it becomes hard ceramic pellets of enriched uranium.

Fuel rod

hard ceramic pellets of enriched uranium is grounded and the cylindrical pellets gets uniform size. The uniform sized pellets are stacked according to the nuclear reactor core's design specifications. The stacking done in the corrosion resistance metal alloy tubes. These tubes are sealed to contain fuel pellets and it is termed as fuel rods.

These finished fuel rods are grouped in special fuel assemblies and used to build up the nuclear fuel core of nuclear reactor.

Steel tube fuel rods

Metal used for tubes depend on nuclear reactor design. Previously stainless steel was used for making this Steel tubes. Now most of the nuclear reactors uses the Zirconium. Most commonly for Boiling water reactor and pressurised water reactor the tubes are assembled into bundles with precise spacing distance apart. All the bundles are given a unique number for identification. These numbering system helps to track the movements of each fuel rod from the manufacturing point to its disposal after spent.

Specification of Fuel fabrication plant

Special care is taken with the size and shape of the processing vessels to avoid criticality. A limited chain reaction releasing radiation is called criticality fault.

With low enriched fuel criticality is not at all expected to occur. Criticality is has a vital consideration in plants handling special fuels for research nuclear reactors.