AGR Fuel

Advanced Gas-cooled Reactor (AGR) fuel is unique to Britain and is used to power the second generation of UK nuclear power stations.

Westinghouse

Manufacturing AGR Fuel

Manufacturing excellences achieved through automation, exacting process control and the work of highly skilled employees.

Advanced Gas-cooled Reactor (AGR) fuel is unique to Britain and is used to power the second generation of UK nuclear power stations. There are currently 14 AGR reactors operating on six sites. They have a total capacity of 7,875 Megawatts (million watts), provide about 15% of the base-load electricity in this country and are fuelled entirely by Springfields.

Manufacturing AGR fuel

An AGR assembly produces the same amount of electricity as 25.5 million cubic metres of gas.

State-of-the-art plant:

Westinghouse operates a highly sophisticated state-of-the-art production plant for the manufacture of AGR fuel. Further developments have been the introduction of stage II and stage III fuel designs, which have resulted in more efficient fuel.

Oxide fuel

AGR fuel elements consist of uranium dioxide pellets stacked inside fuel pins. These pins are then grouped within a graphite sleeve to form a fuel assembly. An AGR assembly is comprised of 36 stainless steel pins, each containing 64 pellets.

How AGR Fuel is Produced

- Uranium ore is chemically processed to produce UF_4.
- Reaction with fluorine gas to UF_6.
- Enrichment.
- Conversions to uranium dioxide.
- Pelleting.
- Canning of pellets to form fuel elements.
- Assembly of pins to form fuel elements.
- Delivery to AGR reactor.

OFC one of the most advanced nuclear manufacturing plants in the world.

Remote operation from a central control room.

Automated production line.

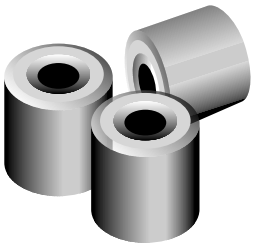
Uranium tetrafluoride (UF_4) must be converted to uranium hexafluoride (UF_6) – and then enriched before oxide fuel can be manufactured.

Enriched UF_6 is converted to uranium dioxide powder (UO_2) via the Integrated Dry Route process (IDR). Further processing including granulation of the UO_2 powder, pellet pressing, sintering and grinding produces fuel pellets ready for stacking inside a stainless steel pin. Once end caps are fitted the pins are scaled and pressurised before being assembled in a graphite sleeve to form an AGR fuel assembly.

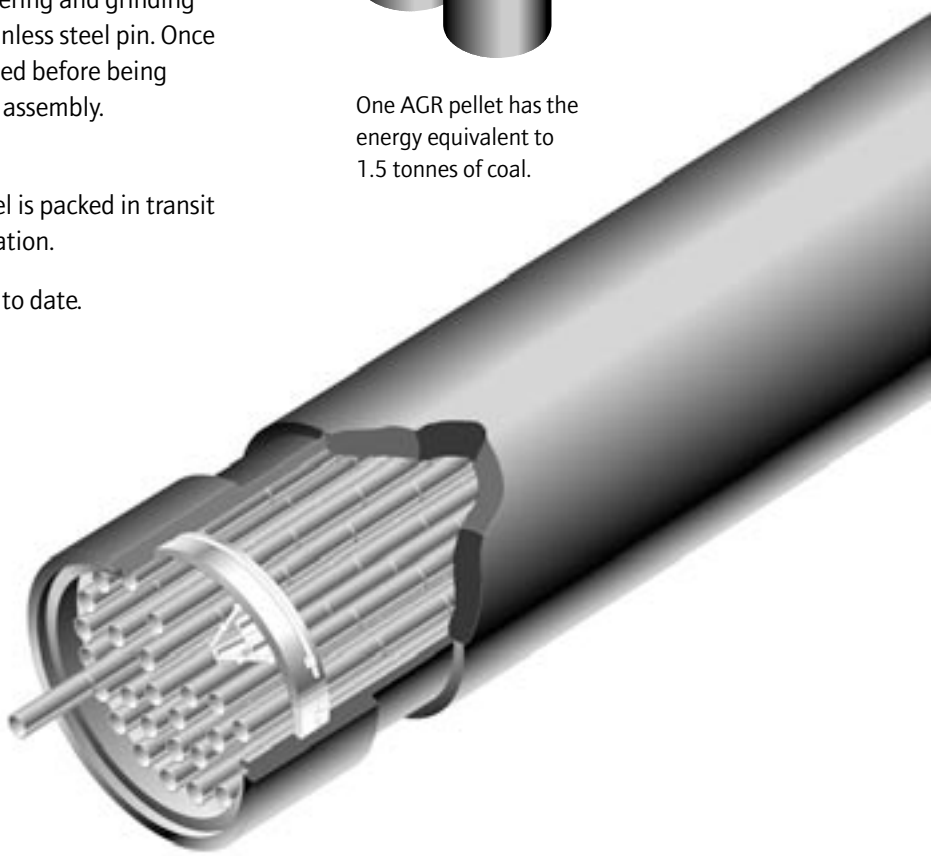
Assembly and Inspection

After final assembly and inspection, the finished fuel is packed in transit containers for dispatch to an AGR nuclear power station.

Over 5,000,000 AGR fuel pins have been produced to date.



One AGR pellet has the energy equivalent to 1.5 tonnes of coal.



An AGR assembly comprises 36 stainless steel fuel pins each containing 64 UO_2 fuel pellets. A single AGR assembly produces the same amount of electricity as 3,600 tonnes of coal.

Quality checks are made at each stage of manufacture.

Final assembly of AGR fuel.

Springfields supplies the fuel for all of Britain's AGR nuclear power stations.

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