



## Pall Ultipor® GF Fine Nuclear Grade Filters

The Ultipor® GF Fine filter is Pall's next-generation filter for nuclear applications. These disposable filter cartridges are rated at 0.05 micron at an efficiency of 99.98%, and use proprietary Pall Ultipor GF Plus media as a fundamental resource.

The medium uses a binder resin which coats the glass and aramid fibers, imparting a positive zeta potential in aqueous service for higher sub-micron particle removal efficiency. These filters also have an integrally bonded fixed-pore structure that produces a rugged composite medium, which resists unloading or media migration.

### Problems with High Radiation

For nuclear plants, reducing out-of-core radiation is a critical need. High amounts of radiation in the nuclear circuit causes contamination of equipment and the creation of hot spots. This results in increased operating costs for the plant due to:

- Increased use of filters to control the high radiation levels
- Increased radwaste disposal costs
- Increased exposure to personnel

### Finer Filtration as a Solution

Sub-micron filtration is a proven technology for reducing radioactive exposure-related costs.

Pall has shown for more than 30 years that dose reduction program-based finer filtration results in a significant reduction in exposure for the plant equipment and its personnel.

Some of the cleanest plants in the world are already equipped with Pall filters, down to 0.1 micron. For these plants, the remaining dosage contributors are nuclear particles occurring in sizes smaller than 0.1 micron.

Therefore, any further dose reduction program needs to remove particles smaller than 0.1 micron more efficiently. The Ultipor GF Fine filter is designed to accomplish this by removing 0.05



Ultipor GF Fine filter

micron particles at 99.98% efficiency. By eliminating these fine dose contributors, Pall filters take the industry one step further towards clean nuclear power, for both the plant and its personnel.

### Pall Ultipor GF Fine Filters

Pall Ultipor GF Fine filter cartridges are made with Pall's proprietary, high-efficiency glass and aramid fiber filter media pleated into low pressure drop modular filter elements.

Pall's new advanced media allows targeting of specific compounds such as various Cobalt isotopes, which occur in sizes smaller than 0.1 micron.

***“Ultipor GF Fine filters are the next step towards cleaner, safer nuclear plant operation.”***

## Features and Benefits

- Absolute rated at 99.98% efficiency, down to 0.05 micron<sup>1</sup>
- Finer media with enhanced Zeta potential improves removal of sub-micron dose contributors (including Cobalt 58, Cobalt 60, and iron oxides)
- Long service life
- High dirt-holding capacity
- High permeability, resulting in lower pressure drop
- Reduced maintenance costs
- Enhanced service life of reactor coolant pump seals

## Applications

The Ultipor GF Fine nuclear-style disposable filters are available in a multitude of styles, depending on the customer requirement. These disposable cartridges, designed for irradiated service, are supported by a perforated stainless steel inner core and / or an outer cage. Internal tie rods (or welded cages) connect the top and bottom end caps and reinforce cartridge integrity, even when the element is handled remotely and lifted from the filter vessel.

These disposable nuclear cartridges are targeted at key nuclear plant applications including:

- Fuel Pool
- Seal Water Injection/Return
- Reactor Coolant Letdown Pre/Post
- Radwaste
- Chemical Addition
- Recycle Evaporator

<sup>1</sup> 99.98% efficiency in a single pass mode with Latex beads as the test contaminant. The test is designed in accordance with the guidelines provided in ASTM 795-F-88 procedure.

Note: The above mentioned standard was withdrawn in 2003 with no replacement.



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