

Applying AVANTech's Innovative Solids Collection Filter (SCF™)

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The SCF™ Technology

- ◆ High flow rates, up to 4,542 l/min (1,200 gpm)
- ◆ High solids loading, >227 kg (>500 lbs)
- ◆ Pressurized system (no level control needed)
- ◆ Void space in liner can be filled with depleted 1.1-1.4 m³ (40-50 ft³) of radioactive resin or DAW
- ◆ No need to characterize each filter (only liner is characterized for disposal)
- ◆ Replaces hundreds of bag and cartridge filters
- ◆ Approved for disposal at Clive-Utah and Andrews-Texas using approved dewatering and packaging procedure

SCF™ Liner

- ◆ Simplified setup and packaging efficiency
- ◆ Standard carbon steel liner: 8-120 or 14-200 typical

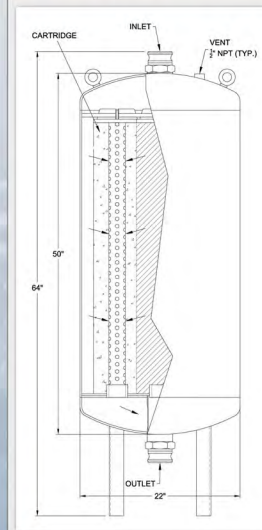


SCF™ Liner Piping Victaulics with ALARA Extensions



SCF™ Liner with Influent/Effluent Plumbing with Clearance for Cask or Process Shield

SCF™ Canister



Filter Membranes in SCF™ Canister (top of canister has been cut off for viewing). Note high dirt loading on depleted filters.

- ◆ Max Pressure: 690 kPa (100 psi)
- ◆ Max Canister D/P: 241 kPa (35 psid)
- ◆ Tare Weight: 181 kg (400 lbs)
- ◆ Max Loaded Weight: 680 kg (1500 lbs)
- ◆ Material: 304SS and Polypropylene
- ◆ Max Flow Rate (based on connection):
 - ◆ 3.8 cm (1-1/2 in.) connections: 284 l/min (75 gpm)
 - ◆ 5 cm (2 in.) connections: 473 l/min (125 gpm)
 - ◆ 7.6 cm (3 in.) connections: 946 l/min (250 gpm)
 - ◆ 15.2 cm (6 in.) connections: 4,542 l/min (1,200 gpm)
- ◆ Filter Micron Options: 1, 2, 5, 10 micron (absolute)
- ◆ Various Interface Connections: male camlock, victaulic fittings, etc.



Example with Four SCF™ Canisters (Without Outer Shell)



Submersible SCF™ in Pool (Four Canisters Without Outer Shell)

Maintaining Water Clarity Saves Time, Dose, and Money

The Applications

Decommissioning

- ◆ Fukushima
- ◆ Indian Point
- ◆ Oyster Creek
- ◆ Pilgrim

Reactor Cavity/Spent Fuel Pool:

- ◆ Brunswick
- ◆ Cooper
- ◆ Laguna Verde
- ◆ LaSalle
- ◆ Maine Yankee
- ◆ Nine Mile Point
- ◆ Oyster Creek
- ◆ Perry
- ◆ Pilgrim
- ◆ Zion

Torus/Suppression Pool:

- ◆ Browns Ferry
- ◆ Cooper
- ◆ Fermi
- ◆ Fitzpatrick
- ◆ Grand Gulf
- ◆ Limerick
- ◆ Pilgrim
- ◆ River Bend
- ◆ UCOR

Tank Desludging:

- ◆ Callaway
- ◆ Fermi
- ◆ Maine Yankee
- ◆ Oyster Creek
- ◆ Pilgrim
- ◆ River Bend
- ◆ South Texas Project
- ◆ Watts Bar
- ◆ Zion

Liquid Radwaste Treatment:

- ◆ Beaver Valley
- ◆ Brunswick
- ◆ Davis-Besse
- ◆ Wolf Creek



The SCF™ Canisters and Liners are Available in Different Sizes Depending on the Application

Result Summaries

Nine Mile Point Nuclear Station

Decontaminated Equipment Pit using high pressure vacuum system and robotic equipment, routing discharge through SCF™ Liner to lower dose and contamination levels without maintenance personnel having to manually decontaminate floor and walls. – **COST AVOIDANCE**

Cooper Nuclear Station

SCF-120 was utilized to collect sludge from torus cleaning during Refueling Outage. Total dose savings recognized was >1.5 man-rem (15 mSv), replacing the old method of using individual filter cartridges. The underwater pool clarity was sufficient to complete these tasks without any delays. – **SCHEDULE ADHERENCE**

Limerick Generating Station

Successful continuous operation of SCF™ Liner Filtration System at >3,217 l/min (>850 gpm) over past four years at Limerick Generating Station in support of torus desludging and diving operations.

– ALARA SAVINGS

- ◆ Maintained suppression pool visibility greater than 4.56 m (15 ft). Record low total exposure to divers.
- ◆ Removed >308.4 kg (>680 lbs) of torus type dirt in 2016 refueling outage, creating significant dose savings.
- ◆ Maintained clarity suppression pool during LOCA pump runs.
- ◆ ALARA savings of 3.59 man-rem (35.9 mSv).

LaSalle County Generating Station

SCF™ Filtration System was utilized to collect ALL solids and silt debris from vacuuming over 50 guide tubes and the inner/outer grating.

– SOURCE TERM REDUCTION

- ◆ 5,550,000 MBq (150 Ci) of source term activity removed from Unit 2.
- ◆ Dose rates/contamination levels lower than any previous outage.
- ◆ AFTER >11,356,235 l (>3,000,000 gal), filter vessel flow maintained 3,407 l/min (900 gpm) at 110 kPa (16 psid; complete turnover every 18 hours).



Dual SCF™ System with Shields

Cost Savings

>100% return on SCF™ investment when compared to individual filter applications.

The Applications are Limitless and Expanding Every Day