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Radioactive Waste Treatment and Decommissioning

Ion exchange resins are an efficient and simple way to purify waste streams and concentrate radioisotopes on a solid substrate before treated liquid is released to the environment or recycled to the nuclear circuits. In certain cases, reverse osmosis membranes can be used to concentrate the radioactive stream and thus reduce the amount of liquid waste requiring treatment. During decommissioning operations, which mainly occur under water, ion exchange resins are used to purify decommissioning units to increase visibility and remove contaminants, as well as treat effluent when the decommissioning pool is emptied.

TECHNOLOGY	PRODUCT	APPLICATION	FEATURES AND RECOMMENDED USES	TYPE	MATRIX	MINIMUM TOTAL VOLUME CAPACITY (eq/L)	IONIC FORM AS SHIPPED
ION EXCHANGE RESINS	DuPont™ AmberLite™ IRN99 H	Rad Waste Treatment	Premium 16% DVB uniform particle size cation resin with very high capacity and oxidative stability. Highest selectivity for cationic radioisotopes and highest total capacity for long runs resulting in reduced waste and exposure.	SAC	GEL	2.50	H+
	DuPont™ AmberLite™ IRN78 OH	Rad Waste Treatment	Premium high solid uniform particle size anion resin with very high capacity used for removal of anionic radioisotopes.	SBA	GEL	1.20	OH-
	DuPont™ AmberLite™ IRN9766 OH	Rad Waste Treatment	Macroporous anion resin designed to remove radioactive colloidal material in all nuclear applications. Often used as an overlay above a mixed bed or a cation resin.	SBA	MACRO	0.85	OH-
	DuPont™ AmberLite™ IRN9652 H	Rad Waste Treatment	Macroporous high-capacity cation resin with high affinity for heavy metals & 137Cs.	SAC	MACRO	1.95	H+
	DuPont™ AmberLite™ IRN160 H/OH	Rad Waste & Decommissioning	High-capacity nuclear grade mixed bed composed of uniform particle size AmberLite™ IRN97 H and IRN78 OH resins on a 1:1 equivalent basis. Designed to minimize separation of anion and cation during installation and transfer.	MB	GEL/GEL	2.10/1.20	H+/OH-
	DuPont™ AmberLite™ IRN170 H/OH	Rad Waste & Decommissioning	Premium nuclear grade mixed bed composed of uniform particle size AmberLite™ IRN99 H and IRN78 OH Resins on a 1:1 equivalent basis. Highest selectivity for radioisotopes and highest total capacity for long resin life resulting in reduced waste and exposure.	MB	GEL/GEL	2.50/1.20	H+/OH-
	DuPont™ AmberLite™ IRN9882 H/OH	Rad Waste & Decommissioning	Nuclear grade macroporous mixed bed composed of 40% cation resin (12%DVB) and 60% AmberLite™ IRN9766 OH resin on a volume basis. Offers high exchange kinetics and the ability to remove colloids for highest decontamination rates.	MB	MACRO/ MACRO	1.65/0.85	H+/OH-
REVERSE OSMOSIS	FilmTec™ Elements	Rad Waste & Decommissioning	Please contact your DuPont representative for assistance.	N/A	N/A	N/A	N/A

Key:

SBA = Strong Base Anion
SAC = Strong Acid Cation
MB = Mixed Bed
Chel. = Chelating resin

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