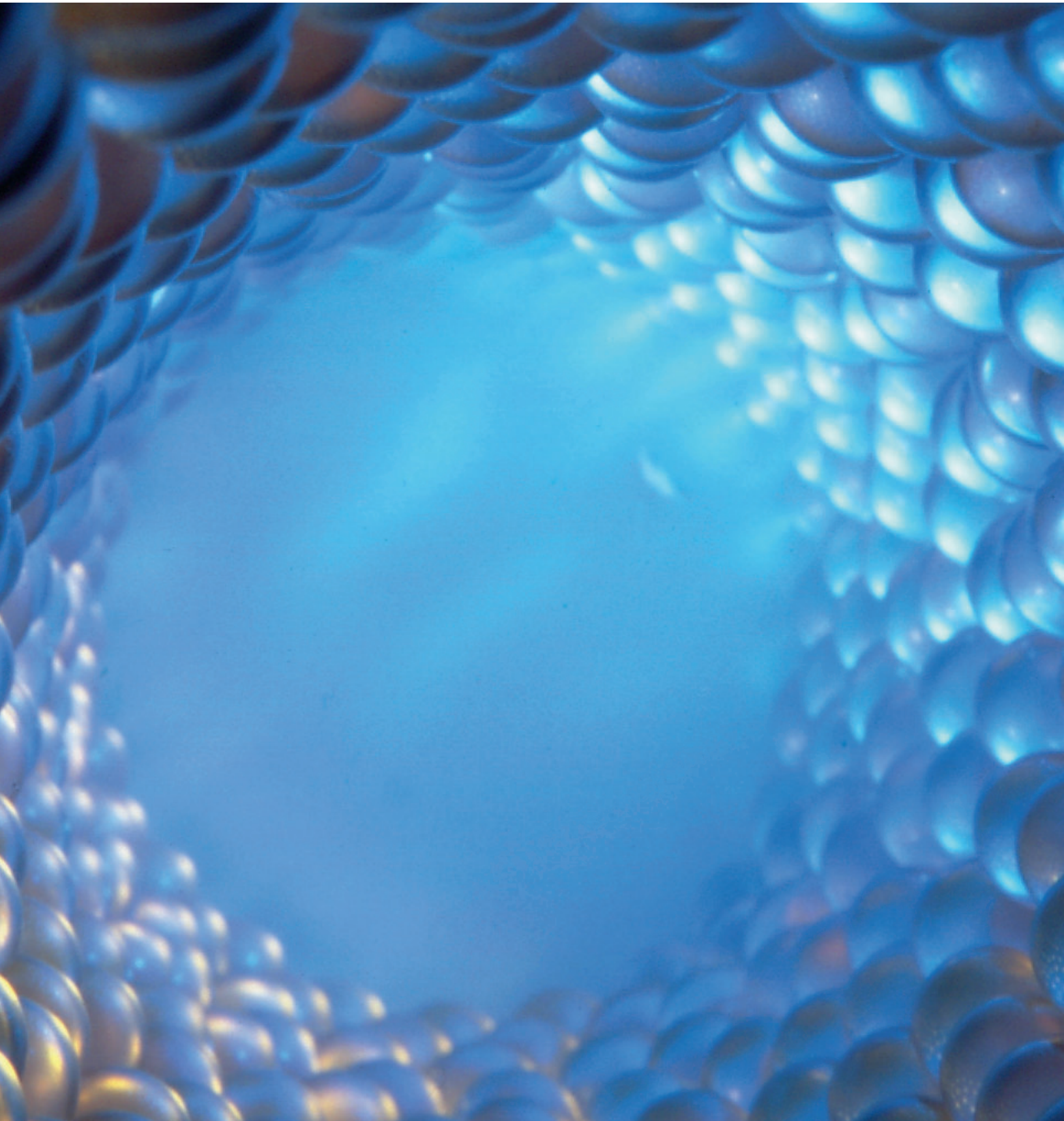
Water Solutions

DUPONT™

Ion Exchange Resins for Chemical Processing



Application & Product Name	Functionality	Matrix	Ionic Form	Minimum Capacity (eq/L)	Water Retention Capacity (%)	Partical Size (µm)	Shipping Weight (g/L)	Shipping Weight (lb/ft³)
Brine Softening								
AmberSep™ IRC747 UPS	Aminomethyl-phosphonic	Macro Styrenic	Na^+	1.75	64 – 69	550 ± 50	755	47.1
AmberSep™ IRC748	Iminodiacetic	Macro Styrenic	Na^+	1.35	60 – 65	500 – 650	750	46.8
AmberSep™ IRC748 UPS	Iminodiacetic	Macro Styrenic	Na^+	1.35	60 – 69	575 ± 75	750	46.8
Purification of Aqueous and Organic Solutions								
AmberSep™ G26 H	Strong acid[6]	Gel Styrenic	H^+	2.00	46 – 51	650 ± 50	800	49.9
AmberLyst™ 15WET	Strong acid	Macro Styrenic	H^+	1.80	52 – 57	600 – 850	770	48.1
AmberLyst™ 15DRY	Strong acid	Macro Styrenic	H^+	4.70[12]	≤ 1.6	< 300: ≤ 0.5 < 425: ≤ 2.0	610	38.1
AmberLyst™ 40WET	Strong acid	Macro Styrenic	H^+	2.20	44 – 53	580 – 800	830	51.8
AmberLyst™ A21	Weak base[7]	Macro Styrenic	FB	1.30	56 – 62	490 – 690	660	41.2
AmberLyst™ A22	Weak base	Macro Styrenic	FB	1.70	40 – 50	475 – 600	640	40.0
AmberLyst™ A23	Weak base	Macro Phenolic[8]	FB	1.80	60 – 65	470 – 740	650	40.6
AmberLyst™ A24	Weak base	Gel Acrylic	FB	1.60	56 – 64	700 – 950	700	43.7
AmberLyst™ A26 OH	Strong base[9]	Macro Styrenic	OH^-	0.80	66 – 75	560 – 700	675	42.1
AmberSep™ 21K XLT	Strong base[9]	Gel Styrenic	Cl^-	1.40	50 – 60	575 ± 50	670	41.8
AmberSep™ IRC748 UPS	Iminodiacetic	Macro Styrenic	Na^+	1.35	60 – 69	575 ± 75	750	46.8
AmberSep™ Retardion 11A8	WAC/SBA	Macro Styrenic	-	1.10	43 – 48	150 – 300	720	44.9
AmberLite™ XAD™4	Adsorbent	Macro Styrenic	-	-	54 – 60	490 – 690	680	42.5
AmberSorb™ L493	Adsorbent	Macro Styrenic	-	-	50 – 65	300 – 1180	620	38.7
AmberSorb™ V493	Adsorbent	Macro Styrenic	-	-	≤ 5	300 – 1180	340	21.2
AmberSorb™ V503	Adsorbent	Macro Styrenic	-	-	≤ 5	850 – 1150	340	21.2
AmberLite™ BD10DRY	Strong acid	-	H^+	4.90[12]	≤ 5	< 300: ≤ 5%	870	54.3
Hydrometallurgy								
AmberSep™ M4195	Bis-Picolymamine	Macro Styrenic	FB/H_2SO_4 salt	35 g Cu/L	40 – 60	297 – 841	670	41.8
AmberSep™ M4195 UPS	Bis-Picolymamine	Macro Styrenic	FB/H_2SO_4 salt	35 g Cu/L	40 – 60	410	670	41.8
AmberSep™ M4196 UPS	HPPA	Macro Styrenic	FB/H_2SO_4 salt	35 g Cu/L	40 – 60	320	670	41.8
AmberSep™ 43600	Thiouronium	Macro Styrenic	FB	0.70	42 – 54	550 ± 50	675	42.1
AmberSep™ 21K XLT	Strong base[9]	Gel Styrenic	Cl^-	1.40	50 – 60	575 ± 50	670	41.8
AmberSep™ 21K 16-20	Strong base[9]	Gel Styrenic	Cl^-	1.20	50 – 58	800 – 1300	690	43.1
AmberSep™ 920U XL	Strong base[11]	Macro Styrenic	Cl^- or SO_4^{2-}	1.00[5]	48 – 60[5]	1050 – 1350	680[5]	42.4[5]
AmberSep™ 920U SO4	Strong base[11]	Macro Styrenic	SO_4^{2-}	1.00[5]	53 – 65[5]	845 – 1050	680 – 710	42.4 – 44.3
AmberSep™ 91419	Strong base	Macro Styrenic	Cl^-	0.23 – 0.33	49 – 59	760 – 1200	670	41.8
AmberSep™ 91419 XL	Strong base	Macro Styrenic	Cl^-	0.30 – 0.40	45 – 55	822 – 1445	670	41.8
AmberSep™ 400	Strong base[9]	Gel Styrenic	SO_4^{2-} or HCO_3^-	1.40[5]	40 – 47[5]	600 – 750	730	45.4[13]
AmberSep™ 4400	Strong base[9]	Gel Styrenic	SO_4^{2-} or HCO_3^-	1.40[5]	40 – 48[5]	610 ± 50	730	45.4[14]
Mercury Removal								
AmberSep™ 43600	Thiouronium	Macro Styrenic	FB	0.70	42 – 54	550 ± 50	675	42.1
AmberSep™ GT75	Alkyl thiol	Macro Styrenic	H^+	0.80	35 – 40	575 ± 50	675	42.1
AmberSep™ GT74	Thiol	Macro Styrenic	H^+	1.40	38 – 46	450 – 700	784	48.9
AmberSorb™ L493	Adsorbent	Macro Styrenic	-	-	50 – 65	300 – 1180	620	38.7
Boron Removal								
AmberLite™ IRA743	N-methylglucamine	Macro Styrenic	FB[4]	0.60	48 – 54	500 – 700	700	43.7

[1] The total capacity has only limited relevance for the operating capacity

[2] All resins are suitable for aqueous and non-aqueous solutions; they have been selected or designed for a particular application to assure a long lifetime, high selectivity, and excellent kinetics, which allow a high operating capacity, low leakage levels, and optimal regenerant utilization

Recommended Max. Op. Temperature (°C)	(°F)	Remarks
80	180	Uniform particle size. Hardness removal from NaCl solutions in membrane chlor-alkali plants: Highest selectivity for Ca and Mg.
90	194	Hardness removal from NaCl solutions in membrane chlor-alkali plants: Highest selectivity for Sr and Ba.
90	194	Uniform particle size. Hardness removal from NaCl solutions in membrane chlor-alkali plants: Highest selectivity for Sr and Ba.
130	266	Uniform particle size. General demineralization processes.
120	250	Cation removal from aqueous streams containing soluble organics.
120	250	Cation removal from organic streams.
140	285	High-capacity resin for cation removal.
100	210[4]	Purification of organic compounds (phenol and glycerine, etc.). Rinse water recyling (demineralization).
120	250	Acid removal from aqueous and organic streams. Demineralization from acidic solutions.
50	120[4]	Phenol deacidification.
50	120[4]	Ag recovery from photographic effluents. Good adsorption and desorption of organics.
60	140[10]	Demineralization of aqueous and non-aqueous solutions.
100	212[5]	Uniform particle size. Removal of Fe^{3+} and Zn^{2+} from HCl. Ag recovery from photographic effluents.
90	194	Heavy metals removal and recovery.
100	212	Chloride removal from caustic. Chromatographic separation of ionic species.
150	300	Removal of aromatic hydrocarbons such as phenols and pesticides from wastes. Hydrogen peroxide purification.
170	340	Removal of organics from aqueous streams.
170	340	Removal of organics from vapor streams.
170	340	Large bead for removal of organics from vapor streams in fluidized bed systems.
120	250	Purification of biodiesel.
75	170[5]	Removal and recovery of Cu, Ni, Co, and Zn from solutions with pH < 4.
75	170[5]	Uniform particle size. Removal and recovery of Cu, Ni, Co, and Zn from solutions with pH < 4.
75	170[5]	Uniform particle size. Removal and recovery of Cu and Ni from solutions with pH < 4.
60	140	Recovery of Pt, PGMs, and precious metals – must be used at pH < 7.
100	212[5]	Uniform particle size. Uranium from alkaline leach ISR operations.
100	212	Screened particle size from 16 – 20 U.S. Mesh. High-efficiency, large-bead resin suitable for fluidized-bed and Resin-In-Pulp (RIP) applications.
-	-	Extra large beads for less resin loss and lower pressure drop. Uranium extraction from leach systems (*in situ* leaching and RIP systems).
-	-	Uranium extraction from sulfuric acid leach systems (*in situ* leaching and RIP systems).
100	212[5]	Recovery of Au from cyanide leaching.
100	212[5]	Recovery of Au from cyanide leaching. Larger uniform particle size, designed specifically for use in Resin-In-Pulp (RIP) processing.
-	-	Recovery of uranium from leach systems using fixed beds, *in situ* leaching, fluidized beds, or Resin-In-Pulp (RIP) applications.
-	-	Extraction of uranium from ore by leaching.
60	140	Removal of Hg – must be used at pH < 7.
60	140	Removal of Hg.
60	140	Removal of Hg from NaCl and NaOH. Regenerable with concentrated HCl.
170	340	Removal of zerovalent Hg.
75	167	Boron removal from concentrated $MgCl_2$ solutions, agricultural water supplies, and wastewaters.

[3] Macroporous styrene-DVB polymer
[4] Free base form
[5] Chloride form
[6] Sulfonic acid
[7] Tertiary amine
[8] Phenol formaldehyde polycondensate
[9] Type I, quaternary ammonium
[10] Hydroxide form
[11] Type II, quaternary ammonium
[12] Dry weight capacity, meq/kg
[13] Sulfate form
[14] Bicarbonate form

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Form No. 45-D01064-en CDP, Rev. 2
January 2020