



Standard Resin Analysis

SAMPLE ID: A220E_RO(0020E03)24
SAMPLE NO: 13807
DESCRIPTION: CATION
SAMPLE POINT: SOFTENER
RESIN ID: C-211

Capacity as Received 1.77
(Meg/ml. (H₂O))
Capacity, New Resin
(Avg.)
Capacity as Recd

RESIN DATA SHEET
USF C-375 SG H CATION RESIN



ION EXCHANGE

USF C-375 SG H is a strong acid
cation exchange resin that is specially
designed for high-purity applications
where organic foulants are
present. The resin is a 100% cross-
linked styrene gel resin
structure. The

application
by USFilter
specification
allows as
control the
negotiate it

USFilter

RESIN
PRODUCTS
AND
SERVICES

Cross-Reference Guide

USFilter Brand	Amberlite Rohm & Haas	Lewatit Bayer	Ionac Sybron	Diaion Mitsubishi	Dowex Dow	Purolite
Weak Acid Cation						
C-271	IRC-76	CNP-80	CCP		MAC-3 (Marathon MAC-3)	C-106
C-281	IRC-86		CC*	WK20N		C-105
Strong Acid Cation						
C-211	IR-120 (1200)	S-100 (Monoplus S-100)	C-249	SKIB	HCR-S (Marathon C)	C-100
C-361	IR-122 (1500)	KP-10	C-250	SK-110	HGR (Marathon C-10)	C100X10
C-381	IR-200	SP-120	CFP-110	PK-228	MSC-1 (Marathon MSC)	C-150
Weak Base Anion						
A-399	Higher capacity weak base Anion (see page 4)					
A-394	IRA-94	MP-64 (Monoplus MP-64)	AFP-329	WA-30	MWA-1 (Marathon WBA)	A-100
A-444	IRA-67	AP-49 (OC1072)		WA-11		A-845
Strong Base Anion						
A-244	IRA-410 (4600)	M-600 (Monoplus M-600)	ASB-2	SA-20A	SAR (Marathon A2)	A-300
A-284	IRA-400 (4200)	M-500 (Monoplus M-500)	ASB-1	SA-10A	SBR (Monosphere 550)	A-600
A-464	IRA-402 (4400)	M-504	ASB-1P	SA-12A	SBR-P (Marathon A)	A-400
A-674	IRA-900	MP-500 (Monoplus MP-500)	A-641	PA-312	MSA-1 (Marathon MSA)	A-500
A-714	IRA-458	AP-247A (OC1074)				A-850
Mixed Bed						
TM-9						MB-400
EDM	MB-150					
NR-6	IRN-150		NM-60		MR-3 (Marathon MR-3)	NRW-37
NR-14			MN-73			

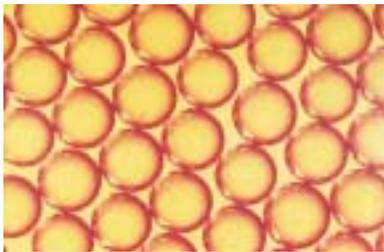
() indicates Uniform Particle Size Equivalent

*Product is no longer available

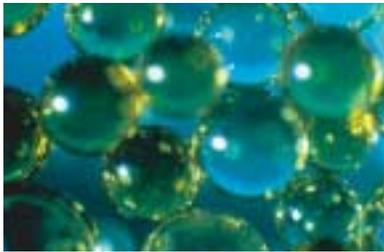
PRODUCTS AND SERVICES TO
ENSURE PEAK PERFORMANCE

Resin Products & Services

The selection, application and supply of ion exchange resins is critical to the performance and cost effectiveness of your water treatment system. For the past 80 years USFilter has pioneered the development and application of a better ion exchange resin. Along the way we acquired and developed technologies from trusted leaders that you are familiar with in the water treatment industry. IWT, Arrowhead, Ionpure, Permutit, Continental, and Penfield are only a few of the many companies that currently make up USFilter. Through these acquisitions we have all the products and services necessary to support your water treatment needs.



Uniform particle sized resin



Poly-dispersed resin

In addition to being the largest distributor of ion exchange resin, we also provide a full range of resin support services including laboratory testing, removal, cleaning and resin re-conditioning for extended life. For specialty applications we offer customized high purity resin processing and blending such as conversion into special ionic forms for FDA cycling for food and pharmaceutical applications.

We offer special handling, custom packaging or bulk delivery to meet your needs. If you are considering disposal and investment recovery options, we have the expertise to help. USFilter combines superior equipment design, operational experience and precise resin evaluations to ensure peak resin performance in your water system. We are your total solutions provider.

USFilter Capabilities

- Large and diverse inventory of resins including USFilter brand, Bayer, Sybron, Dow and Rohm and Haas
- Spare and replacement parts
- 24 hour customer service
- Regional distribution warehouses
- 12-24 hour shipment of stocked resin
- Extensive analytical and laboratory testing
- Resin processing, conditioning and packaging facilities
- Bulk pick up and delivery service
- Trained technical and service staff
- Resin performance and process guarantees
- Resin disposal or investment recovery

QUALITY ASSURED USING

USFILTER BRAND RESIN

▼ **Six Regional Distribution Areas**

Conroe, TX

Fallsington, PA

Jacksonville, FL

Los Angeles, CA

Port Allen, LA

Rockford, IL



Largest inventory of resin allows 24 hour shipment of any resin in stock

Choose USFilter Brand Resin

Our USFilter brand resin is produced by the leading resin manufacturers to meet our stringent, performance based specifications. These standards are higher than those currently used by the manufacturers in testing their own products.

Over 20 years ago USFilter established the USFilter brand resin. As a leader in resin technology, we noticed a trend toward inconsistent performance and quality of resins available in the marketplace. Because of the process

guarantees we offer, it became necessary to set more stringent, tighter resin performance specifications. Thus, the USFilter brand resin was established to ensure our customers receive the highest quality product.

Advantages of Choosing USFilter Brand Resin

- We offer USFilter brand resin at cost savings over equivalent products.
- Produced by the leading resin manufacturers, but must meet high performance specifications.
- We test USFilter brand resin to guarantee specification compliance.
- Our QA/QC program is ANSI N45.2, 10CFR50 (appendix B), and 10CFR21 compliant to meet nuclear safety requirements.
- We can provide process performance guarantees upon request.
- Extensive technical support and resin application knowledge.
- Annual resin analysis at no charge.
- Custom packaging to meet your volume needs.
- We provide Certificates of Analysis, Certificate of Conformance, and Shelf Life statements upon request.



State-of-the-art laboratory testing

USFilter Brand Quality Assurance Testing

USFilter brand resin is guaranteed to meet our performance specifications. The resin is tested in our analytical lab to verify compliance to these specifications. Despite pre-qualifying of the approved manufacturers, we still typically reject 20-25% of the resin lots tested due to their inability to meet our

rigorous requirements. With USFilter brand resins, you are assured of the highest quality product. And, since USFilter is the largest user and supplier of ion exchange resin in North America, we are able to use our purchasing strength to provide USFilter brand resins at very competitive prices.



USFilter's diverse inventory of resin

USFilter brand resin is tested for these performance parameters

- Capacity
- Particle Size
- Percent Salt Split Capacity vs. Total Capacity
- Percent Whole, Cracked, Broken
- Percent Conversion
- Bead Strength
- Percent Moisture
- Metallic and inorganic impurities
- Kinetics

Additional performance tests we can offer

- Kinetics (*Mass Transfer - SO₄ or other specific ion*)
- TOC Extractables (*Total organic leachable testing*)
 - 16 Hour Soak (*Static, high temperature*)
 - Dynamic (*Flow*)
- Organic Cl, SO₄ Extractables (*breakdown of the organic and analyze for inorganic*)
 - 16 Hour Soak (*Static, high temperature, UV breakdown*)
 - Dynamic (*column flow, UV breakdown*)
 - Parr Bomb (*total destruction of resin, residual analysis*)
- Terminal Settling Velocity (TSV) (*Predictor of resin separability or inseparability*)
- Super Fines (*-60 mesh particle size*) (*Potential source of resin intrusion*)

USFILTER BRAND RESIN PRODUCT GUIDE

Model	Type	Ionic Form	Capacity (Meq/ml)	Moisture (%)	Particle Size (+16, -50 Mesh) %	Whole Broken (%)
Standard Resin						
Cation						
C-211	8% Gel Cation	Sodium	2.0 min.	44-48	5, 1	90 / 10
C-211 H	8% Gel Cation	Hydrogen	1.8 min.	50-56	5, 1	90 / 10
C-361	10% Gel Cation	Sodium	2.2 min.	38-43	5, 1	90 / 10
C-361 H	10% Gel Cation	Hydrogen	2.0 min.	46-51	5, 1	90 / 10
C-381	20% Macroporous	Sodium	1.7 min.	38-51	5, 2	95 / 5
C-381 H	20% Macroporous	Hydrogen	1.7 min.	49-56	5, 2	95 / 5
C-391 H	12% Macroporous	Hydrogen	1.8 min.	49-56	5, 2	95 / 5
C-271	Acrylic Weak Acid	Hydrogen	3.0 min.	52-58	5, 1	90 / 10
C-281	Acrylic Weak Acid	Hydrogen	4.2 min.	44-50	5, 1	90 / 10
Anion						
A-244	Gel Type II	Chloride	1.35 min.	40-45	5, 1	90 / 10
A-244 OH	Gel Type II	Hydroxide	1.1 min.	40-45 (Cl)	5, 1	90 / 10
A-284	Gel Type I	Chloride	1.4 min.	43-48	5, 1	90 / 10
A-284 OH	Gel Type I	Hydroxide	1.2 min.	43-48 (Cl)	5, 1	90 / 10
A-464	Gel Type I Porous	Chloride	1.2 min.	52-59	5, 1	90 / 10
A-464 OH	Gel Type I Porous	Hydroxide	1.0 min.	52-59 (Cl)	5, 1	90 / 10
A-674	Macroporous Type I	Chloride	1.0 min.	54-64	5, 3	95 / 5
A-674 OH	Macroporous Type I	Hydroxide	0.9 min.	54-64 (Cl)	5, 3	95 / 5
A-714	Acrylic Type I	Chloride	1.2 min.	58-62	5, 3	90 / 10
A-714 OH	Acrylic Type I	Hydroxide	1.0 min.	58-62 (Cl)	5, 3	90 / 10
A-874	Macro Type II	Chloride	1.2 min.	48-56	1, 1	90 / 10
A-874 OH	Macro Type II	Hydroxide	1.0 min.	48-56 (Cl)	1, 1	90 / 10
A-399	Macro Weak Base	Hydroxide	1.7 min.	40-50	5, 3	95 / 5
A-499	Macro Weak Base	Hydroxide	1.7 min.	40-50	1, 1	95 / 5
A-444	Acrylic Weak Base	Hydroxide	1.6 min.	57-62	5, 3	95 / 5
Mixed Bed						
TM-8	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 1	90 / 10
TM-9	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 1	90 / 10
NR-6	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 0.5	90 / 10
NR-14	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 0.5	90 / 10
EDM	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 1	>85

Kinetics (Mixed Bed Test)	Temperature (Max Op. °F)	Primary Application	Features
> 15 megohm	250	Softening and demineralization	Standard cation
> 15 megohm	250	Demineralization	Standard cation
> 15 megohm	250	Hot condensate polishing	High capacity, resistant to oxidative, mechanical and osmotic degradation
> 15 megohm	250	Demineralization in oxidative or high flow applications	
> 15 megohm	250	High porosity for surface waters, condensate polishing and wastewater	Highly resistant to oxidative, mechanical and osmotic degradation and organic fouling.
> 15 megohm	250	Widely used for deashing or demineralization of water and other liquids when organic fouling is high.	Good exchange capacity, excellent stability at elevated temperatures and good chemical resistance.
> 15 megohm	250		
NA	250	Dealkalization and softening	Macroporous structure
NA	250	Dealkalization and softening	Gel structure
> 15 megohm	140	High capacity demineralization of water	High regeneration efficiency
> 15 megohm	95		
> 15 megohm	140	High capacity demineralization of water including good silica removal.	Premium gel highly recommended for non regenerable systems
> 15 megohm	140		
> 15 megohm	140	Demineralization of water including good silica removal	Tolerant to organic fouling and is recommended for regenerable systems.
> 15 megohm	140		
> 15 megohm	140	Demineralization including silica removal, high organics, and waste water	Resistant to organic fouling and is recommended for regenerable systems on surface water sources.
> 15 megohm	140		
> 15 megohm	140	Demineralization including silica removal, high organics, and waste water	Highly resistant to organic fouling and is recommended for regenerable systems on surface water sources with low temperature regeneration.
> 15 megohm	100		
N/A	100	Demineralization in organic laden water or in food process applications	High resistance to organic fouling and is typically used in food processing applications
N/A	140		
NA	140	Removal of strong acids in water treatment, food, or pharmaceutical applications.	Higher operating capacity than typical styrene based WBA resins
NA	140	Removal of strong acids in water treatment, food, or pharmaceutical applications.	Highest operating capacity available in a styrene based WBA. Uniform particle size.
NA	165	Removal of strong acids in water treatment applications with high organic loading.	This product is not recommended for use in food or pharmaceutical applications, but is good for surface water sources.
> 15 megohm	100	High capacity general purpose mixed bed for water treatment applications	1:1 Chemical equivalent mix of 8% cation and Type II anion.
> 15 megohm	140	General purpose mixed bed for water treatment applications when silica removal is important and organic fouling is a potential.	1:1 Chemical equivalent mix of 8% cation and Type I porous anion.
> 15 megohm	140	General purpose mixed bed with high capacity for water treatment applications when silica removal is important	1:1 Chemical equivalent mix of 8% cation and Type I anion.
> 15 megohm	140	Mixed bed for critical water treatment applications when silica removal is important and organic fouling is a potential.	1:1 Chemical equivalent mix of 8% cation and Type I porous anion.
> 15 megohm	140	Mixed bed for EDM machines and other metal removal applications.	1:1 Chemical equivalent mix of strong acid cation and strong base anion.

USFILTER BRAND RESIN PRODUCT GUIDE

Model	Type	Ionic Form	Capacity (Meq/ml)	Moisture (%)	Particle Size (+16, -50 Mesh) %	Whole Broken (%)
Electronics Grade Resin						
Cation						
C-211 SG H	8% Gel	Hydrogen	1.8 min.	50-56	5, 0.5	90 / 10
C-361 SG H	10% Gel	Hydrogen	2.0 min.	46-51	5, 0.5	90 / 10
C-361 MEG	10% Gel	Hydrogen	2.0 min.	46-51	2, 0.2	95 / 5
C-381 SG H	20% Macroporous	Hydrogen	1.7 min.	49-56	5, 0.5	95 / 5
C-373 SG H	10% Gel	Hydrogen	1.9 min.	46-51	650 micron + 50	95 / 5
C-373 MEG	10% Gel	Hydrogen	1.9 min.	46-51	650 micron + 50	95 / 5
C-375 SG H	10% Gel	Hydrogen	1.9 min.	46-51	700 micron ± 50	95 / 5
C-375 MEG	10% Gel	Hydrogen	1.9 min.	46-51	700 micron ± 50	95 / 5
Anion						
A-254 SG OH	Type I Porous Gel	Hydroxide	1.0 min.	44-50 (Cl)	590 ± 50 micron	95 / 5
A-254 MEG	Type I Porous Gel	Hydroxide	1.0 min.	44-50 (Cl)	590 ± 50 micron	95 / 5
A-284 SG OH	Type I Gel	Hydroxide	1.2 min.	43-48 (Cl)	5, 0.5	95 / 5
A-464 SG OH	Type I Porous Gel	Hydroxide	1.0 min.	52-59 (Cl)	5, 0.5	95 / 5
A-464 MEG	Type I Porous Gel	Hydroxide	1.0 min.	52-59 (Cl)	3, 0.5	95 / 5
K-8802 (SG)	Macroporous	Hydroxide	Operation Dependent	< 60%	5, 5	NA
Mixed Bed						
NR-6SG	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 0.5	90 / 10
NR-14SG	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 0.5	90 / 10
NR-30SG	Mixed Bed	H/OH	2.0/1.0 C/A	N/A	5, 0.5	95 / 5
NR-30 MEG	Mixed Bed	H/OH	2.0/1.0 C/A	N/A	5, 0.5	95 / 5

Kinetics (Mixed Bed Test)	Temperature (Max Op. °F)	Primary Application	Features
> 17 megohm	250	Demineralization applications when low TOC leachables are required	Specially processed for low TOC leachables
> 17 megohm	250	Mixed bed demineralization applications or potential aggressive environment and low TOC leachables are required	Specially processed for low TOC leachables
18 megohm	250	Mixed bed demineralization applications or potential aggressive environment, low TOC and metallic leachables, and extremely low cross contamination are required	High kinetics, specially processed for low leachables and high separation (TSV modification)
> 17 megohm	250	Mixed bed demineralization applications or potential aggressive environment and low TOC leachables are required	Specially processed for low TOC leachables
> 17 megohm	250	Demineralization in high flow critical mixed bed applications	Uniform particle size, high kinetics, specially processed for low leachables.
18 megohm	250	Microelectronics applications where low TOC, low metals, and separation are critical	Uniform particle size specially processed for high kinetics, superior separation, and extremely low leachables and particles.
> 17 megohm	250	Demineralization in high flow critical mixed bed applications, and separation characteristics are a factor.	Uniform particle size, high kinetics, specially processed for low leachables.
18 megohm	250	Microelectronics applications where low TOC, low metals and the ultimate in separation are required	Uniform particle size specially processed for high kinetics, ultimate separation and extremely low leachables (ppt), and particles.
> 17 megohm	140	Demineralization in high flow critical mixed bed applications	Uniform particle size, specially processed for high kinetics, high conversion, low leachables and low impurities. ETA tolerant
18 megohm	140	Demineralization in high flow critical mixed bed applications and cross contamination is a major factor.	Uniform particle size, specially processed for high kinetics, high conversion, low leachables, low impurities, and TSV modified. ETA tolerant
> 17 megohm	140	Demineralization in applications requiring high capacity, low TOC, and silica removal	Specially processed for high kinetics, high conversion, and extremely low TOC.
> 17 megohm	140	Demineralization in regenerable applications requiring low TOC, and silica removal.	Specially processed for high kinetics, high conversion, and extremely low TOC.
18 megohm	140	Demineralization in high flow critical mixed bed applications and separation is a major factor.	Specially processed for high kinetics, high conversion, extremely low leachables, low impurities, and TSV modified for separation.
NA	100	Boron selective resin	Specially processed for low TOC leachables.
> 17 megohm	140	High capacity mixed bed primarily for non regenerable electronics applications requiring low TOC leachables	1:1 Chemical equivalent mix of 8% cation and Type I anion specially processed for extremely low TOC leachables.
> 17 megohm	140	Electronics grade mixed bed with potential higher organic load and requiring low TOC leachables.	1:1 Chemical equivalent mix of 8% cation and Type I porous anion specially processed for extremely low TOC leachables.
> 17 megohm	140	Electronics grade regenerable mixed bed with potential higher organic load and requiring low TOC leachables.	1:1 Chemical equivalent mix of 10% cation and Type I porous anion specially processed for extremely low TOC leachables.
18 megohm	140	Microelectronics grade regenerable mixed bed requiring superior separability, extremely low TOC, and metals leachables.	1:1 Chemical equivalent mix of 10% cation and Type I porous anion specially processed for high kinetics, extremely low TOC and metals leachables, and TSV modified for separation.

USFILTER BRAND RESIN PRODUCT GUIDE

Model	Type	Ionic Form	Capacity (Meq/ml)	Moisture (%)	Particle Size (+16, -50 Mesh) %	Whole Broken (%)
Electronics Grade Resin						
Mixed Bed (continued)						
NR-38SG	Mixed Bed	H/OH	1.7/0.9 C/A	N/A	5, 0.5	95 / 5
NR-45 MEG	Mixed Bed	H/OH	1.9/1.0 C/A	N/A	Cation 650 micron ± 50 Anion 550 micron ± 50	95 / 5
NR-46 MEG	Mixed Bed	H/OH	Operation Dependent	N/A	5, 5	95 / 5
Specialty Metal Finishing						
K-7701	Amino Phosphonic	Sodium	Operation Dependent	65 max	5, 1	90 / 10
K-7803	Iminodiacetic	Sodium	Operation Dependent	65 max	5, 1	90 / 10
Pharmaceutical/Food and Beverage Resin						
Cation						
C-211 XRR Na	8% Gel Cation	Sodium	2.0 min.	44-48	5, 1	90 / 10
C-211 XRR H	8% Gel Cation	Hydrogen	1.8 min.	50-56	5, 1	90 / 10
Anion						
A-244 XRR Cl	Type II gel	Chloride	1.35 min.	40-45	5, 1	90 / 10
A-244 XRR OH	Type II gel	Hydroxide	1.1 min.	40-45 (Cl)	5, 1	90 / 10
A-464 XRR CL	Type I Porous Gel	Chloride	1.2 min.	52-59	5, 1	90 / 10
A-464 XRR OH	Type I Porous Gel	Hydroxide	1.0 min.	52-59 (Cl)	5, 1	90 / 10
TA-41 SO ₄	Type I Porous Gel	Sulfate	1.2 min.	52-58	5, 1	90 / 10
A-464 SG OH	Type I Porous Gel	Hydroxide	1.0 min.	52-59 (Cl)	5, 0.5	90 / 10
Mixed Bed						
TM-8 XRR	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 1	90 / 10
TM-9 XRR	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 1	90 / 10
NR-6 SG	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 0.5	90 / 10

Kinetics (Mixed Bed Test)	Temperature (Max Op. °F)	Primary Application	Features
> 17 megohm	140	Electronics grade regenerable mixed bed with potential higher organic load and requiring low TOC leachables.	1:1 chemical equivalent mix of 20% macroporous cation and Type I macroporous anion specially processed for high kinetics, and extremely low TOC and metals leachables.
18 megohm	140	Microelectronics grade regenerable mixed bed requiring superior separability, extremely low TOC, and metals leachables.	1:1 Chemical equivalent mix of 10% uniform particle size cation and uniform particle size Type I porous anion, specially processed for high kinetics, extremely low TOC and metals leachables, and TSV modified for separation.
18 megohm	100	Special mix for polishing MB applications requiring boron and TOC reduction with high resistivity.	High kinetics/resistivity, mixed bed with boron and TOC reduction
NA	185	Brine softening	High selectivity for divalent cations
NA	175	Heavy metals removal	High selectivity for multivalent cations
> 15 megohm	250	Deionization applications in food, and pharmaceutical applications	Cross regenerated for compliance in FDA applications.
> 15 megohm	250	Deionization applications in dialysis, food, and pharmaceutical applications	Cross regenerated for compliance in FDA applications.
> 15 megohm	140	General deionization application in food and pharmaceutical applications	Cross regenerated for compliance in FDA applications.
> 15 megohm	95	General deionization application in food and pharmaceutical applications	Cross regenerated for compliance in FDA applications.
> 15 megohm	140	General deionization application in food and pharmaceutical applications when silica removal is important	Cross regenerated for compliance in FDA applications.
> 15 megohm	140	General deionization application in food and pharmaceutical applications when silica removal is important	Cross regenerated for compliance in FDA applications.
> 15 megohm	140	General deionization application in food and pharmaceutical applications when silica removal is important	Cross regenerated for compliance in FDA applications and finished in the sulfate form for storage or special applications.
> 17 megohm	140	General deionization application in food and pharmaceutical applications when silica removal is important	Specially processed for compliance in FDA applications, and extremely low TOC levels are required.
> 15 megohm	100	High capacity, general purpose, mixed bed for water treatment, food, and pharmaceutical applications	1:1 Chemical equivalent mix of 8% cation and Type II anion cross regenerated for FDA compliance.
> 15 megohm	140	Mixed bed for water treatment, dialysis, food, and pharmaceutical applications when silica removal is important and organic fouling is a potential.	1:1 Chemical equivalent mix of 8% cation and Type I porous anion, cross regenerated for FDA compliance.
> 17 megohm	140	High capacity, general purpose, mixed bed for water treatment, dialysis, food, and pharmaceutical applications	1:1 Chemical equivalent mix of 8% cation and Type I anion, specially processed for extremely low TOC leachables.

USFILTER BRAND RESIN PRODUCT GUIDE

Model	Type	Ionic Form	Capacity (Meq/ml)	Moisture (%)	Particle Size (+16, -50 Mesh) %	Whole Broken (%)
Condensate Polishing and Nuclear Resin Cation						
NR-1	8% Gel	Hydrogen	1.8 min.	50-55	5, 0.5	90 / 10
C-361C Na	10% Gel	Sodium	2.2. min.	38-43	2, 0.5	95 / 5
C-361C H	10% Gel	Hydrogen	2.0 min.	46-51	2, 0.5	95 / 5
C-361MEG	10% Gel	Hydrogen	2.0 min.	46-51	2, 0.2	95 / 5
C-373 SG H	10% Gel	Hydrogen	1.9 min.	46-51	650 micron ± 50	95 / 5
C-373PS/SG H	10% Gel	Hydrogen	1.9 min.	46-51	650 micron + 50	95 / 5
C-373PS/SG ETA H	10% Gel	Hydrogen	1.9 min.	46-51	650 micron + 50	95 / 5
C-375 SG H	10% Gel	Hydrogen	1.9 min.	46-51	700 micron ± 50	95 / 5
C-375PS/SG H	10% Gel	Hydrogen	1.9 min.	46-51	700 micron ± 50	95 / 5
C-375PS/SG ETA H	10% Gel	Hydrogen	1.9 min.	46-51	700 micron ± 50	95, 3, 5
C-381C H	20% Macroporous	Hydrogen	1.7 min.	49-56	5, 1	95 / 5
C-381PSMB H	20% Macroporous	Hydrogen	1.7 min.	49-56	5, 0.5	95 / 5
TCD-1	8% Dyed Gel	Hydrogen	1.8 min.	50-56	5, 1	90 / 10
Anion						
NR-2 LC	Type I Gel	Hydroxide	1.2 min.	43-48 (Cl)	5, 0.5	90 / 10
A-254 SG OH	Type I Porous Gel	Hydroxide	1.0 min.	44-50 (Cl)	590 ± 50 micron	95 / 5
A-254PS/SG OH	Type I Porous Gel	Hydroxide	1.0 min.	44-50 (Cl)	590 ± 50 micron	95 / 5
A-284C OH	Type I Gel	Hydroxide	1.2 min.	43-48 (Cl)	5, 0.5	95 / 5
A-284 OH LS	Type I Gel	Hydroxide	1.2 min.	43-48 (Cl)	5. 0.5	95 / 5

Kinetics (Mixed Bed Test)	Temperature (Max Op. °F)	Primary Application	Features
> 17 megohm	250	High capacity cation for use in primary, secondary and radwaste systems	High kinetics, low leachables, and low metallic impurities
> 17 megohm	250	Sodium cycle hot condensate polishers	Excellent stability and chemical resistance at high temperatures.
> 17 megohm	250	Condensate polishing, or other high flow applications.	High kinetics, low leachables, and excellent stability
18 megohm	250	Excellent separation for use in critical mixed bed applications	High kinetics, specially processed for low leachables, and separation (TSV modification)
> 17 megohm	250	Demineralization in high flow critical mixed bed applications	Uniform particle size, high kinetics, specially processed for low leachables.
18 megohm	250	Demineralization in high flow critical mixed bed applications and low cross contamination is important	Uniform particle size, high kinetics, superior separation, low leachables, and TSV modification
18 megohm	250	Primarily for condensate polishing applications using ETA	Uniform particle size, high kinetics, superior separation, extremely low leachables, and tolerant to ETA environment.
> 17 megohm	250	Demineralization in high flow critical mixed bed applications, and separation characteristics are a factor.	Uniform particle size, high kinetics, specially processed for low leachables.
18 megohm	250	Demineralization in high flow critical mixed bed applications, and cross contamination is a major factor.	Uniform particle size, high kinetics, superior separation, low leachables, and TSV modification
18 megohm	250	Primarily for condensate polishing applications using ETA and the ultimate in separation is required	Uniform particle size, high kinetics, superior separation, extremely low leachables, and tolerant to ETA environment.
> 17 megohm	250	Treatment of aggressive waters with high flow, high temperature applications	Excellent stability and chemical resistance at high temperatures.
> 17 megohm	250	Treatment of aggressive waters with high flow, high temperature applications and separation is critical.	High kinetics, low leachables, excellent stability, and TSV modified
> 15 megohm	250	Dyed cation for use in cation conductivity measurement.	High capacity, low metals, color indication
> 17 megohm	140	Primary, secondary, and radwaste applications	High capacity, high conversion, low leachables, and low chloride
> 17 megohm	140	Demineralization in high flow critical mixed bed applications	Uniform particle size, specially processed for high kinetics, high conversion, low leachables and low impurities. ETA Tolerant
18 megohm	140	Demineralization in high flow, critical mixed bed applications and cross contamination is a major factor.	Uniform particle size, specially processed for high kinetics, high conversion, low leachables, low impurities, and TSV modified. ETA Tolerant
> 17 megohm	140	Demineralization in high flow, critical mixed bed applications	Specially processed for high kinetics, high conversion, low leachables, and low impurities.
> 17 megohm	140	BWR condensate polishing, anion underlayment, and other less separable applications	Specially processed for high kinetics, high conversion, low leachables, low impurities, and TSV modified for non-separation.

USFILTER BRAND RESIN PRODUCT GUIDE

Model	Type	Ionic Form	Capacity (Meq/ml)	Moisture (%)	Particle Size (+16, -50 Mesh) %	Whole Broken (%)
Condensate Polishing and Nuclear Resin Anion (continued)						
A-284PSMBC OH	Type I Gel	Hydroxide	1.2 min.	43-48 (Cl)	3, 0.5	95 / 5
A-464 LC OH	Type I Porous Gel	Hydroxide	1.0 min.	52-59 (Cl)	5, 0.5	90 / 10
A-464PSMB	Type I Porous Gel	Chloride	1.2 min.	52 - 59	3, 0.5	95 / 5
A-464MEG	Type I Porous Gel	Hydroxide	1.2 min.	52-59 (Cl)	3, 0.5	95 / 5
A-674PSMB	Type I Macroporous	Chloride	1.0 min.	54-64	3, 0.5	95 / 5
A-674 PSMBSG OH	Type I Macroporous	Hydroxide	0.9 min.	54 - 64 (Cl)	3, 0.5	95 / 5
Mixed Bed						
NR-6LC	Mixed Bed	H/OH	1.8/1.2 C/A	N/A	5, 0.5	90 / 10
NR-14LC	Mixed Bed	H/OH	1.8/1.0 C/A	N/A	5, 0.5	90 / 10
NR-31LC	Mixed Bed	H/OH	2.0/1.2 C/A	N/A	5, 0.5	95 / 5
NR-35	Mixed Bed	H/OH	1.7/1.2 C/A	N/A	5, 0.5	95 / 5
NR-500LS	Mixed Bed	H/OH	2.0/1.2 C/A	N/A	500 micron Cation	95 / 5
NR-550LS	Mixed Bed	H/OH	2.1/1.2 C/A	N/A	550 micron Cation	95 / 5
NR-20 LC	Mixed Bed	Li7/OH	1.8/1.2 C/A	N/A	5, 0.5	90 / 10

Kinetics (Mixed Bed Test)	Temperature (Max Op. °F)	Primary Application	Features
18 megohm	140	Demineralization in high flow, critical mixed bed applications and separation is a factor.	Specially processed for high kinetics, high conversion, low leachables, low impurities, and TSV modified for separation.
> 17 megohm	140	Primary, secondary, and radwaste applications	High capacity, high conversion, low leachables, and low chloride
> 17 megohm	140	Demineralization in high flow critical mixed bed applications and separation is a factor.	High kinetics, TSV modified for separation
18 megohm	140	Demineralization in high flow critical mixed bed applications and separation is a major factor.	Specially processed for high kinetics, high conversion, extremely low leachables, low impurities, and TSV modified for separation.
> 17 megohm	140	Demineralization in high flow critical mixed bed applications with potential organic loading and separation is a factor.	High kinetics, TSV modified for separation, excellent stability, and chemical resistance
> 17 megohm	140	Demineralization in high flow critical mixed bed applications with potential organic loading and separation is a factor.	Specially processed for high kinetics, high conversion, extremely low leachables, low impurities, and TSV modified for separation. ETA Tolerant
> 17 megohm	140	High capacity general purpose mixed bed for primary and radwaste systems.	1:1 Chemical equivalent mix of 8% cation and Type I anion specially processed for extremely low TOC leachables and low chlorides.
> 17 megohm	140	General purpose mixed bed for primary and radwaste systems and organic laden applications.	1:1 Chemical equivalent mix of 8% cation and Type I porous anion specially processed for extremely low TOC leachables and low chlorides.
> 17 megohm	140	High capacity general purpose mixed bed for primary, secondary, condensate polishing and radwaste systems.	1:1 Chemical equivalent mix of 10% cation and Type I anion specially processed for extremely low TOC leachables and low chlorides.
> 17 megohm	140	Primarily used in blow down demineralizer applications or suppression pool for Co, Cs control	2:1 chemical equivalent mix of 20% macroporous cation and Type I gel anion specially processed for extremely low TOC leachables.
> 17 megohm	140	Less separable crud removal mixed bed based on a 500 micron cation for BWR condensate polishing	Custom mix of 10% cation and Type I anion specially processed for extremely low TOC leachables, low chlorides, and TSV modified for less separability.
> 17 megohm	140	Less separable crud removal mixed bed based on a 550 micron cation for BWR condensate polishing	1:1 chemical equivalent mix of 12% cation and Type I anion specially processed for extremely low TOC leachables, low chlorides, and TSV modified for less separability
> 15 megohm	140	Lithium 7 hydroxide mixed bed for primary systems	1:1 chemical equivalent mix of Li7 form cation and Type I anion specially processed for extremely low leachables, and low chlorides

▼ **Resin Processing Facilities**

- Columbus, OH
- Conroe, TX
- Fallsington, PA
- Jacksonville, FL
- Los Angeles, CA
- Richmond, VA
- Rockford, IL
- South Windsor, CT



Resin regeneration facility in Rockford, IL



USFilter resin tanker

From resin processing and resin disposal to system performance optimization, our specialty resin services are designed to help you operate your plant efficiently and cost effectively.

Custom Resins for Your Exact Requirements

USFilter provides resin processing services to meet customers high purity needs. Our specially designed facility uses microelectronics grade water (typically <3 ppb TOC, 18+ Megohm and <50 ppt Na) to ensure the integrity of the processes.

Special customer requirements may include:

- Extremely low organic leachable impurities (TOC, UV Cl, UV SO₄, etc.)
- Conversion to specific ionic forms (Li-7, K, Ca, various amines, etc.)
- Terminal Settling Velocity Modified (for improved separability)
- Custom mixing and blending of resins
- Custom packaging of resins (Mylar, Heat sealed, 0.5-7 CF drums, 20-35 CF supersacks)
- FDA cycling for food and pharmaceutical applications (taste and odor free)

Resin Cleaning and Reconditioning

USFilter provides services for salvaging your fouled, cross-contaminated and/or exhausted resin. We can remove resins, transport them to our local processing plant, convert the resins and return them to your facility. This extends their useful life, minimizes costs

and reduces system downtime. We can also do this on a routine basis for condensate polishing or other water treatment applications. The resin can be transported to and from the job site in our tanker trucks, 55 gallon drums, lined fiber drums, or supersacks.

Bulk Resin Service

USFilter offers bulk delivery and disposal of resin. We eliminate drum handling by slurring the resin directly from your water treatment service vessels to one of our fleet of tanker trucks.

Whether we're delivering your own

regenerated resin or providing new resin, we greatly reduce the steps involved and the documentation and administrative controls that go with temporary on-site and off-site disposal of resin.

▼ Turnkey Services

1. Pre-disposal Toxicity Characteristic Leachable Procedure (TCLP) testing for hazardous chemicals and metals.
2. Pre and post disposal documentation.
3. Removal of existing resin.
4. Visual inspection of the service vessel.
5. Installation of the new resin.
6. Pre-arranged disposal at a licensed land fill or investigate potential investment recovery through used resin brokers.



Periodic resin testing ensures optimum performance

Turnkey Resin Removal and Replacement Services

When it's time to remove and replace your existing resin, consider USFilter to handle your needs on a full turnkey basis. USFilter's team of trained professionals will provide complete project coordination, from predisposal testing through new resin installation to used resin landfill disposal or investment

recovery (used resin brokers). We do it all. With complete responsibility in USFilter's hands, you can be assured that your project will be completed on schedule, within budget and most importantly, in full compliance with all environmental regulations.

Laboratory Testing and Process Evaluation

To ensure optimum performance from your water treatment system, USFilter recommends periodic laboratory analysis of your ion exchange resin. USFilter's laboratory capabilities determine resin quality, as well as diagnosing operating

problems and evaluating new ion exchange products for conventional and special liquid processing applications. Our lab can perform the following tests on your resin samples.

Standard laboratory resin testing

- Capacity before/after clean up steps
- Iron Fouling
- Percent moisture
- Microscopic visual examination
- Particles size

Additional testing available

- Percent conversion
- Organic Cl, SO₄ TOC Extractables
 - 16 hour soak (UV)
 - Dynamic (UV)
 - Parr Bomb
- Terminal Settling Velocity (TSV)
- Super Fines (-60 mesh)
- Bead strength
- Metallic impurities
- Cross contamination
- Kinetics (Mix Bed Test)
- Kinetics (Mass Transfer)
- TOC Extractables
 - 16 hour soak
 - Dynamic

WHAT CAN USFILTER
DO FOR YOU?

▼ **Required Data for System Evaluation**

1. Current water analysis
2. System flow and vessel sizes
3. Resin type and volume
4. Chemical dosage or rates
5. Chemical costs
6. Water quality and quantity required
7. Current throughput



USFilter offers the total solution to all your resin needs.

USFilter has the experience and knowledge to help prolong the useful life of your resin and to also determine when it is more economical to replace the resin. Let USFilter and our technical staff optimize your system today!

Optimizing Your Ion Exchange Resin System

In today's competitive market, it is crucial that your water treatment system is reliable and operates at its optimum performance level. We help our customers achieve this by prolonging the useful life of their resin and minimizing related operating expenses. Using our computer-based design programs, we evaluate your system's current operating data and costs and determine any variance between optimal performance and your current system results. We will provide you with performance improvement recommendations and help to ensure that you are getting the most from your system and operating expense dollars.

Your USFilter Service Technician can help you to optimize your system and determine whether you have passed the system's "Economic Replacement Point" (ERP). Every ion exchange system has an ERP, where the cost of replacing the resin is more economical than the

expenses associated with operating a poor performing system.

We begin by gathering data on your system and a water analysis. Next, the resin is analyzed to determine its current condition. (USFilter recommends planned, semi-annual resin sampling and analysis to identify premature or excessive degradation.) The data is evaluated and recommendations are made based on the current operating parameters, chemical costs and the condition of the resin. If the resin analysis indicates that the resin's capacity can be recovered by cleaning, we can assist with on-site resin cleaning procedures or provide off-site services at one of our regeneration facilities. If the lost capacity cannot be restored and the ERP has been exceeded, we will assist in determining the economic payback for changing the resin and provide details in a written report.

▼ Factors Effecting ERP

1. Resin characteristics and degradation factors
2. Number of operation cycles
3. Labor costs
4. Chemicals, water and other related costs
5. Resin cost

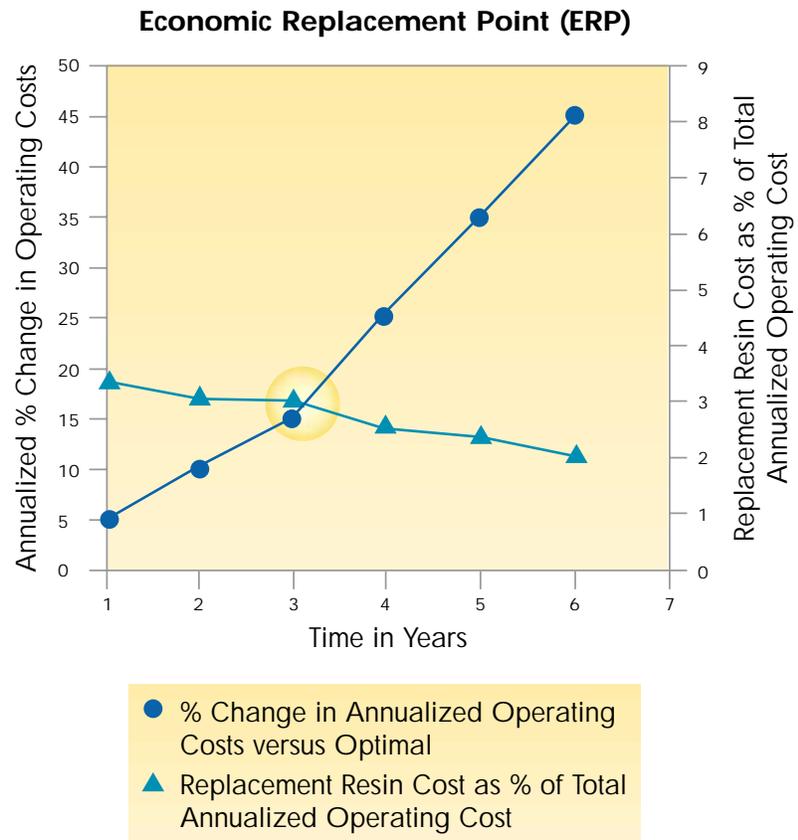
Economic Replacement Point:

Several factors determine a system's ERP.

The most significant of these are the costs associated with chemicals, water and labor. The cost for replacement resin as a percentage of the total annualized system operating expense is relatively small – typically, 2.5-7.5%.

The ERP is the intersection between

two parameters; annualized percent change in operating costs versus optimal, and the replacement cost of the resin as a percent of the total annualized operating costs, versus time. The intersection of these two parameters typically occurs when the resin has lost 15-20% of its capacity.



The graph illustrates the ERP for a typical demineralization system. As the resin ages, the costs associated with maintaining and operating the system (Chemicals, Water and Labor) increase; therefore, increasing the percent change in operating costs versus optimal, and decreases the resin's replacement cost as a percentage of the operating costs. When the percent increase in operating costs becomes greater than the cost of the replacement resin as a percent of the annualized operating cost, it is more economical to replace the resin.

Markets and Applications That USFilter Supports

POWER

- BWR condensate polishing
- PWR and conventional condensate polishing
- Radwaste
- Makeup-DI
- Stator cooling
- Cation conductivity

MUNICIPAL WATER RECOVERY AND REUSE

OIL FIELD, REFINERY, CHEMICAL AND PETROCHEMICAL

- Boiler feedwater
- Process water
- Product purification
- Wastewater
- Catalytic resin

SEMICONDUCTOR AND ELECTRONICS

- Primary and secondary mixed bed resin
- Boron selective resin
- Resin separation technology
- Low TOC resin

DRINKING WATER

LABORATORY, MEDICAL/DIALYSIS, FOOD AND BEVERAGE

- Taste and odor free processed resin
- FDA processed resin
- Catalytic resin
- Sugar demineralization and fractionation chromatography resin and technology
- Wastewater

PHARMACEUTICAL AND BIOTECHNOLOGY

- Taste and odor free processed resin
- FDA approved processed resin
- Catalytic resin
- Process resin purification

WATER POLLUTION CONTROL

PULP AND PAPER

- Boiler feedwater
- Hot condensate polishing resin
- Organic tolerant resin

GROUNDWATER REMEDIATION AND LEACHEATE

METAL FINISHING

- Metal recovery
- Chelator resin

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(800) 466.7873 *Customer Service 24 hour*
(800) 582.5261 *Technical Support*

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Rockford, IL 61103

In Canada

USFilter Canada East (Toronto)
(905) 890.2803 *Customer Service 24 hour*

USFilter Canada West (Calgary)
(403) 250.2650 *Customer Service 24 hour*

or contact your local USFilter branch

<http://www.usfilter.com>

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