

Chemical Protection

An Established Leader for Effective Protection.

A unique choice of lengths for efficient protection.

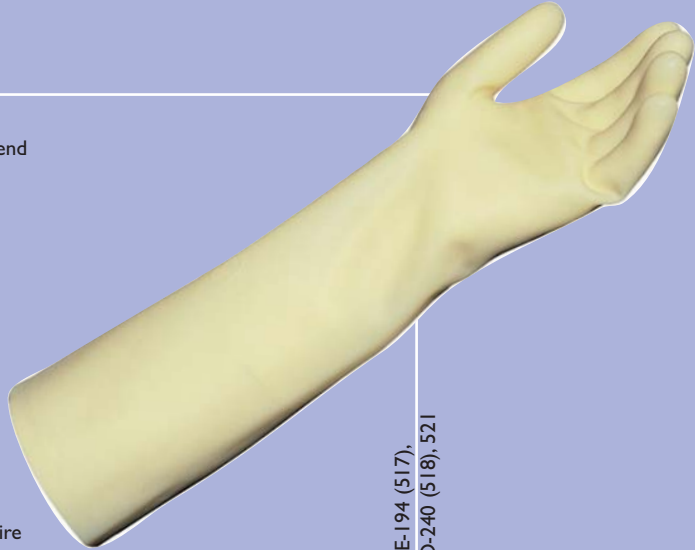
Finished, inspected and packaged in certified class ISO 5 (M3.5) clean environments.

Class ISO 4 (M2.5) Compatible.

TRIONIC® 514 Plus, E-194 (517), E-194BPK (5179), O-240 (518), 521

Product Benefits

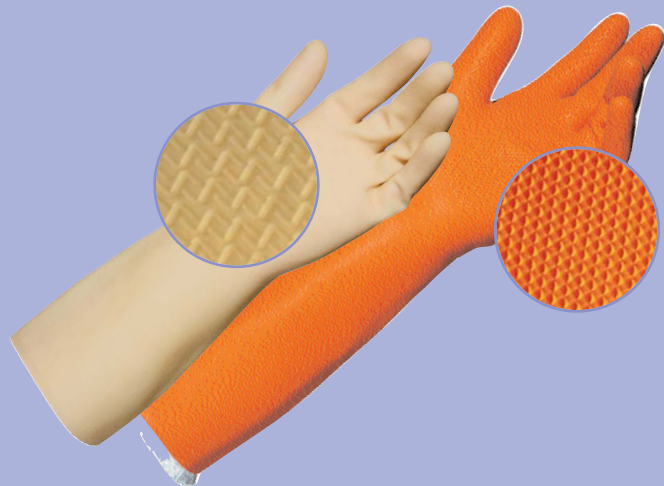
- TRIONIC's exclusive, nitrile, neoprene and natural rubber blend provides excellent glove strength and durability with high-level of protection against a wide range of chemicals and mixtures.
- Worker comfort and reduced hand fatigue: hand specific design, extensive size range.
- Easy donning/doffing and double gloving thanks to exclusive chlorination process.
- Double gloving facilitated by the large cuff E-194 (517), and 521 gloves.
- Snug fit over garment: sleeves keeping gloves up on forearm 514 Plus, and O-240 (518) gloves.
- Excellent grip in wet conditions: non-slip surface "Z pattern" E-194 (517), E-194BPK (5179), and 521 or "Diamond" 514 Plus, O-240 (518) on the palm and fingers.
- The O-240 (518) reference is intended for users who require acid application identification (orange color).
- Bulk pack E-194BPK (5179) or pair pack availability extends a choice to meet specific glove dispensing needs.



TRIONIC® 514 Plus, E-194 (517), E-194BPK (5179), O-240 (518), 521

Applications

- Wafer Fabrication
- Semiconductor Manufacturing
- Acid Etching
- Chemical Mixing, Handling and Transporting
- Handling Quartzware Instruments and Equipment
- Handling silicon wafers in acids baths (521)
- Applications in mini-environments (521)



Quality Standards & Test Methods

- Particles, extractables and NVR's (Non-Volatile Residues) tested using IEST-RP-CC005.2 recommended test methods on randomly selected production.
- Corrosion levels tested in accordance with ASTM D130.
- Meets or exceeds 1.5% AQL in accordance with ASTM D3577. 100% inspected and leak tested using air inflation and light.
- Finished, inspected and packaged in MAPA's own clean environments for confidence in consistent cleanliness and quality levels.

Class ISO 4 (M2.5) compatible. Average particles per cm²: 500 or less.

- Warning: this product contains Natural Rubber Latex and is not recommended for use by those who may be allergic to Natural Rubber proteins.
- Natural Rubber protein levels test below detection using modified Lowry assay in accordance with ASTM D5712.
- In compliance with 21 CFR 170-199.
- Permeation tests performed in accordance with ASTM F739 and EN 374-3.
- Degradation tests performed in accordance with ASTM D471.
- Elongation, tensile and tear tested in accordance with ISO 37 and ISO 34-2 respectively and EN 388.
- Manufactured in an ISO 9002 certified MAPA facility.





▶ Chemical Resistance Chart

Inorganic and Organic Chemicals	CAS #	Degradation Index (1 to 4)	BreakThrough Time (minutes)	Permeation Index (0 to 6)	ASTM Standards D471 and F739				Normalized BTT	Permeation Rate at steady state (µg/cm ² /mn)
					Degradation: % Wt. Change in minutes					
					5	30	60	240		
Acetic Acid (99%)	64-19-7	4	32	2	0	0	0	8	32	0.1
Acetone (98%)	67-64-1	4	12	1	0	0	0	<3	6*	120
Ammonium Fluoride (40%)	12125-01-8				NT	NT	NT	NT	>480	<0.01
Ammonium Fluoride (79%)	12125-01-8				0	1	<3	<3	>480	<0.01
Ammonium Hydroxide (30%)	1336-21-6				NT	NT	NT	NT	36	4.5
2-Butoxyethanol (Butyl Cellosolve)	111-76-2	4	53	2	NT	NT	NT	NT	53*	22.8
2-Butoxyethylacetate (Butyl Cellosolve Acetate) (85%)	112-07-2				NT	NT	NT	NT	35*	538.2
Butyl Acetate (99%)	123-86-4	4	7	0	0	0	0	83	7*	121
2-Ethoxyethanol (Cellosolve) (99%)	110-80-5	4	27	1	NT	NT	NT	NT	27*	14
Ethoxyethyl Acetate (Cellosolve Acetate) (99%)	111-15-9				0	0	0	20	14	46.6
Chromic Acid (50%)	7738-94-5				NT	NT	NT	NT	60	>1000
Cyclohexanone (99%)	108-94-1				NT	NT	66.1	NT	23	56.4
Cyclopentanone	120-92-3				NT	NT	NT	NT	11	169
Diethylamine (98%)	109-89-7				NT	NT	NT	NT	4	176
N,N-Dimethylacetamide (99%)	127-19-5				NT	NT	NT	NT	47	105
Dimethylamine (35%)	124-40-3				NT	NT	NT	NT	53	8.8
Dimethylsulfoxide (DMSO) (99%)	67-68-5				NT	NT	1.7	NT	181	2.1
Ethyl 3-Ethoxypropionate (99%)	763-69-9				NT	NT	NT	NT	>480	<0.1
Ethyl Lactate (95%)	97-64-3				NT	NT	NT	NT	>480	<0.1
Ethylene Glycol (99%)	107-21-1				NT	NT	NT	NT	>480	<0.1
Freon TF (99%)	76-13-1	1	20	1	64	NR	NR	NR	20*	410
Hexamethyl Disilazane (HMDS) (98%)	999-97-3				NT	NT	NT	NT	>480	<0.1
Hydrochloric Acid (10%)	7647-01-0	4	>480	6						
Hydrochloric Acid (35%)	7647-01-0	4	140	4	0	0	0	<2	101*	22.8
Hydrofluoric Acid (10%)	7664-39-3	4	>480	6	0	0	0	0	>480*	ND
Hydrofluoric Acid (49%)	7664-39-3				0	1	2	2	390	45
Hydrogen Peroxide (30%)	7722-84-1	4	>480	6	0	0	0	0	>480*	ND
Isopropanol	67-63-0	4	38	2	0	0	0	1	38*	3.5
Methanol	67-56-1	4	19	1	0	0	0	0	19*	7.2
2-Methoxyethanol (Methyl Cellosolve) (99%)	109-86-4				NT	NT	NT	NT	40*	10
2-Methoxyethanol Acetate (Methyl Cellosolve Acetate) (98%)	110-49-6				NT	NT	NT	NT	27*	53
Methyl Amyl Ketone (98%)	110-43-0				NT	NT	44	NT	8	275
N-Methyl 2-Pyrrolidinone	872-50-4	4	35	2					49.6	137
Nitric Acid (10%)	7697-37-2	4	>480	6	0	0	0	0	>480*	ND
Nitric Acid (70%)	7697-37-2				NT	NT	9.5	NT	171	27
Nitric Acid (90%)	7697-37-2	3	7	1	NR	NR	NR	NR	7	32.9
Phenol (saturated)	108-95-2				0	0	0	<6	102*	18
Phosphoric Acid (85%)	7664-38-2	4	>480	6	0	0	0	0	>480	ND
Potassium Hydroxide (50%)	1310-58-3				NT	NT	NT	NT	>480*	ND
Propylene Glycol Methyl Ethyl Acetate (PGMEA) (99%)	108-65-6				NT	NT	NT	NT	47	99
Sodium Hydroxide (50%)	1310-73-2	4	>480	6	0	0	0	0	>480*	ND
Sulfuric Acid (10%)	7664-93-9	4	>480	6	0	0	0	0	>480*	ND
Sulfuric Acid (95-98%)	7664-93-9	2	42	2	17.1	44.1	NR	NR	79.7	>2676
Tetrachloroethylene (Perchloroethylene) (99%)	127-18-4	1	11	1	110	NR	NR	NR	4	990.5
Tetramethyl Ammonium Hydroxide (TMAH) 25%	75-59-2				NT	NT	.20	NT	>480	ND
1,1,1-Trichloroethane	71-55-6				70	NR	NR	NR	>11*	NRD
Xylene	1330-20-7	1	4	0	64	NR	NR	NR	>4	60.6

*: non normalized data
 NT: Not Tested
 ND: None Detected
 NRD: No Rate Determined
 NR: Not Recommended



Chemical Resistance Chart

ASTM Standards D471 and F739

Electronic Process Chemical Mixtures.		Degradation: % Wt. Change in minutes				Normalized BreakThrough Time	Permeation Rate at steady state (µg/cm ² /mn)
		5	30	60	240		
Aluminum Etch	(1)	0	0	0	3	>480*	ND
Baker PRS 1000	(2)	NT	NT	NT	NT	<20	14.9
Baker PRS 2000	(3)	NT	NT	NT	NT	130	523
Baker PRS 3000	(4)	NT	NT	NT	NT	>480	<0.1
Buffered Oxide Etch	(5)	0	0	0	0	>480*	ND
Dichromate Cleaning Solution	(6)	0	0	0	1	>480*	ND
KTI Pad Etch	(7)	NT	NT	NT	NT	>480	<0.1
KTI Silicon Etch I	(8)	NT	NT	NT	NT	>480	<0.1
Nitride Etch	(9)	0	0	0	0	>480	NDJ
Piranha Etch	(10)	NT	NT	NT	NT	243	12.6
Potassium Hydroxide Etch	(11)	0	0	0	1	278	0.1
Slope Etch	(12)	0	0	0	3	260*	0.03

Chemical Mixture Key

- | | |
|---|--|
| (1): 81% Phosphoric Acid (85%)
9% Nitric Acid (69%)
1% Triton X-100
9% DI Water | (7): 30% Acetic Acid
30% Ammonium Fluoride
1% Aluminum Acetate
39.9% DI Water |
| (2): 15% 2-(2-Ethoxyethoxy) Ethanol
35% Sulfolane
45% 1-Methyl-2-Pyrrolidinone
5% Tetraethylene Glycol
1% Ethanol Amine | (8): 64% Acetic Acid
34% Nitric Acid
2% Hydrofluoric Acid (48%) |
| (3): 8% Tetraethylene Glycol
30% Tetrahydrothiophene 1, 1-Dioxide
15% 2-(2-Ethoxyethoxy) Ethanol
7% Monoisopropanolamine
40% 1-Methyl-2-Pyrrolidinone | (9): 100% Phosphoric Acid (85%) |
| (4): 50% NMP
40% 1,1 Dioxide Tetrahydrothiophene
10% Monoisopropanolamine | (10): 38% Sulfuric Acid (96%)
12% Hydrogen Peroxide (30%)
50% DI Water |
| (5): 14% Hydrofluoric Acid (49%)
28% Ammonium Fluoride
15% Glycerine
1% Triton X-100
42% DI Water | (11): 78% Potassium Hydroxide (45%)
11% 2-Butanol
11% Propanol |
| (6): 10% Potassium Dichromate
8% Sulfuric Acid (96%)
81% DI Water
1% Triton X-100" | (12): 69% Phosphoric Acid (85%)
20% Acetic Acid (99%)
10% Nitric Acid (69%)
1% Triton X-100 |

*: non normalized data
NT: Not Tested
ND: None Detected
NRD: No Rate Determined

TRILONIC® 514 Plus, E-194 (517),
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Category 3 Certification

Degradation Key

Weight Change	Performance Rating
0 - 10%	Excellent
11 - 20%	Good
21 - 30%	Fair
Over 30%	Poor



Packaging Subject to Change

TRIONIC® 514 Plus, E-194 (517), E-194BPK (5179) O-240 (518)

Material	Color	External Finish	Length Gauge
Nitrile, Neoprene and Natural Rubber blend	514 Plus	Embossed	14"/35.5 cm
	E-194 (517)		0.020"/0.50 mm
	E-194BPK (5179) and 521 Unpigmented		521 18"/46 cm 0.020"/0.50 mm
	O-240 (518) Orange		514 Plus 15"/38 cm 0.020"/0.50 mm

Packaging Specifications

- Pair packaged in heat sealed, clean polybag except E-194BPK (5179) bulk packed 12 pairs in twist tied polybag
- Pair packaged styles double bagged: 12 pairs in twist tied polybag
- Each carton "H" taped, sealing all carton folds, top and bottom
- Each bag and carton imprinted with lot #'s for traceability
- Minimal printing on pair packaging for reduced contamination
- Packaging conforms to CE requirements
- Case Size: 15.5" x 12.25" x 9" (394 x 311 x 228 mm) for all references except 521: 15.35" x 11.8" x 12.05" (390 x 300 x 306 mm)
- 514 Plus: 16.5" x 12.25" x 9.75" (419 x 311 x 247 mm)
- Case Weight: 17 lbs. (7.7 kg) all references except 521: 25 lbs (11.5 kg)
- 514 Plus: 19 lbs (8.6 kg)

Case Packing

- 1 pair / sealed polybag except E-194BPK (5179)
- 12 pairs / master polybag
- 6 master polybags / case
- 72 pairs / case



Ordering Information						
Sizes	514 Plus Pair	O-240 (518) Pair	521 Pair	Sizes	E-194 (517) Pair	E-194BPK (5179) Bulk
6	514316			6-6 ^{1/2}	517316	517986
7	514317	518567		7-7 ^{1/2}	517317	517987
8	514318	518568	521318	8-8 ^{1/2}	517318	517988
9	514319	518569	521319	9-9 ^{1/2}	517319	517989
10	514310	518560	521310	10-10 ^{1/2}	517310	517980
11	514311	518561		11	517311	517981

Due to the nature of the products, the dimensions expressed are nominal values. For more detailed information: product brochure available upon request from MAPA ADVANTECH Customer Service.

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