



CHEMICAL COMPATIBILITY TABLE

For ChemQuik[®], DrumQuik[®] & NS & HFC-12 Series Coupling Materials

(Updated 10/06/04)

INTERPRETATION OF TEST DATA					
	SWELLING (In 30 days to 1 year of exposure)		LOSS OF TENSILE STR.		DESCRIPTION OF CHEMICAL ATTACK
	Linear (Plastics)	Volumetric (Elastomers)	(Plastics)	(Elastomers)	
A	< 10%	<= 15%	< 15%	<= 15%	Excellent, little or no swelling, softening or surface deterioration Good chemical resistance, minor swelling, softening or deterioration Limited chemical resistance, moderate attack, conditional service Severe attack, not recommended for use
B	< 15%	<= 30%	< 30%	<= 30%	
C	< 20%	<= 50%	< 50%	<= 60%	
NR	> 20%	> 50%	> 50%	> 60%	

NOTE: All temperatures are in degrees Fahrenheit. Conversion: °C = (°F - 32)/1.8

CHEMICAL		SPRING Materials					COUPLING Materials			SEAL Materials		
Name	Formula	Hastelloy C	316 SS	PPS	PEEK™	PTFE/316SS	Polypro	PVDF	PTFE/PFA	Viton®	EPDM	Chemraz®
Acetic Acid	C ₂ H ₄ O ₂	A to 212°	A to 212°	A	A	A (PTFE Encapsulated 316 Stainless St.)	A to 140° AB 50-100% to 160° AB to 80% to 180°	A to 122° A to 10% to 225° AB to 50%,150-200°	A	A 10% to 70° B 10-25% to 100° B 50% to 140°	A to 70° AB to 200°	A A to 70°
Acetic Anhydride (Acetyl Oxide)	(CH ₃ CO) ₂ O	A	A to 40% to 165° A 40-100% to 300°	A to 200°	NO TEST RESULT	A (PTFE Encapsulated 316 Stainless St.)	AB to 130° NR @ 140°	AB to 70° NR @ 122°	A	B 50% to 70° NR 50% @ 100° NR 100% @ 70°	B to 200°	A
Acetone (Dimethyl Keytone)	CH ₃ COCH ₃	A	A to 212°	A to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 230°	A to 10% to 122° AB 50% to 77°	A	NR	A to 200°	A
Acetonitrile (Methyl Cyanide)	CH ₃ CN	B @ 70°	A 100% to 100° NR 4% @ 192°	A to 200°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	AB to 75° NR @ 122°	A to 125° B @150° NR @ 180°	A	NR	A	A
Amines (General)		A to 85% to 160° AB to 200°	A	A to 70°	A to 70°	A	AB to 120°	NR	A	NR	AB to AC	A
Ammonia Gas (Anhydrous)	NH ₃	A @ 100% to 140°	A to 40% to 165° A 40-100% to 212°	A to 200°	A	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 212°	A	A	NR	A to 140°	A (Black 550) AB (White 571 & 592)
Ammonia (Aqueous) (Ammonium Hydrate)	NH ₃	A to 100% to 70° AB to 100% to 200°	A to 100% to 70° AB to 212°	A to 30% to 70° A to 10% to 200°	AB	A (PTFE Encapsulated 316 Stainless St.)	A to 185°	A	A	AB 30% to 70° C 10% @ 104° A ammonia H2O	A 100% to 212°	A
Ammonium Fluoride	NH ₄ F	A to 25% to 175° A 45% to 260°	AB to 10% to 212° NR > 10%	NR	NO TEST RESULT	A (PTFE Encapsulated 316 Stainless St.)	A	A	A°	A to 140°	A to 140°	A
Ammonium Hydroxide (Ammonia, Aqueous)	NH ₄ OH	A to 47% to 70° A 100% to 150° AB 100% to 200°	A to 100% to 70° A 100% to 150°	A to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 225°	A to 200°	A	A46% to 70° AB to 70° B 104-140°	A to 160° AB to 200°	A
Ammonium Sulfate (Dolamin)	(NH ₄) ₂ SO ₄	A to 10% to boiling A sat. to 130° AB sat. to 200°	A to 37% to 221° AB 38-80% to 150° A sat'd to boiling	A to 200°	A	A (PTFE Encapsulated 316 Stainless St.)	A 10% to 100°	A	A to 400°	A to 70°	A to 120°	A
Aqua Regia (NitroHydrochloric Acid)	HCL-HNO ₃	NR (Titanium: A to 70°) (Tantalum: A)	NR	NR	NR	A (PTFE Encapsulated 316 Stainless St.)	C at 70 - 104°	A to 100° AB to 178° B a 212°	A	A to 70° B to 185°	B to 104° NR at 140°	A (White 571 & 592) AB to 70° (Black 550)
Citric Acid	C ₆ H ₈ O ₇	A to boiling	A to 50% B 100% 70-212° NR 60-100% >125°	A to 220°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A	A	A	A	A	A
Copper Sulfate (Cupric Sulfate)	CuO ₄ S	A to boiling	A to 100% to 160° A to 45% to 180° A to 10% to 2121°	A to 223°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A	A	A	A to conc. to 176° AB to 212°	A to conc. to 176° AB to 212°	A
Dichloroacetic Acid (DCA)	CL ₂ CHCO ₂ H	NO TEST RESULT	NO TEST RESULT	NO TEST RESULT	NO TEST RESULT	A (PTFE Encapsulated 316 Stainless St.)	AB to 100% to 125°	AB to 50% to 212° AB 100% to 125°	A	NR	NO INFO.	A
Dichloromethane (Methylene Dichloride)	CH ₂ CL ₂	AB	A to 70°	A 100% to 70° A/NR 40% @ 100°	NR	A (PTFE Encapsulated 316 Stainless St.)	B/NR @ 70° C/NR @ 88-122°	AB to 100° to 100° B 100% 104 - 125°	A	B @ 70°	BC to 130° NR @ 140°	A
DI water	H ₂ O	A	A	A to 200°	A	A (PTFE Encapsulated 316 Stainless St.)	A	A	A	A to 70° AB to 200°	A to 70° AB to 200°	A

CHEMICAL		SPRING Materials					COUPLING Materials			SEAL Materials		
Name	Formula	Hastelloy C	316 SS	PPS	PEEK™	PTFE/316SS	Polypro	PVDF	PTFE/PFA	Viton®	EPDM	Chemraz®
Ethyl Alcohol (Ethanol/Grain Alcohol) (Denatured Alcohol)	C ₂ H ₅ OH	A to 100% to 212°	A to 100% to 200°	A	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 180°	A to 100% to 176° AB to 100% to 280°	A	A to 70°	A to 200°	A
Ethylene Glycol	HOCH ₂ -CH ₂ OH	A 20-100%	A 40-100% to 200° A 100%	A to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A	A	A	A to 250°	A to 212°	A
Ethyl Acetate (Acetic Ether)	C ₄ H ₈ O ₂	A	A	A 100% to 100°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	A to 180°	A to 70° B 100 - 122° NR @ 170°	A	NR	A to 130°	A
Ether (Ethyl Ether) (Diethyl Oxide)	C ₄ H ₁₀ O	A 100% to 200° A to 56% to 171°	A 100% to 212°	A to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	NR	AB to 94° B @ 104° NR @ 140°	A	NR	NR	A
Formic Acid (Formylic Acid)	CH ₂ O ₂	A 88% @ 212°	A to 5% AB 5 - 80% to 212° B 80 - 100% to 212° A 100% to 200°	A to 100% to 70° A to 40% to 200° NR @ 37% @ 150°	AB to 10% to 70° BC 100% @ 70°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 70° A to 40% to 104° C 100% @ 140°	A to 100% to 212°	A	AB to 50% to 104° NR 60-100% @ 70°	A to 200° A to 90% to 212°	B
Hexane (Dipropyl) (N-Hexane)	C ₆ H ₁₄	A	A 100% to 200°	A to 200°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	BC @ 70-104° C @ 120-140° NR @ 140°	A	A	A to 200°	NR	A
HMDS (1,1,1,3,3,3-Hexamethyldisilazane) Bis(trimethylsilyl)amine	C ₆ H ₁₉ NSi ₂	NO TEST RESULT	NO TEST RESULT	NO TEST RESULT	NO TEST RESULT	A (PTFE Encapsulated 316 Stainless St.)	NO TEST RESULT	NO TEST RESULT	A	NO TEST RESULT	NO TEST RESULT	A
Hydrobromic Acid (Hydrogen Bromide)	HBr	A 50% to 80° A 100% to 140° AB to 20% to 70°	NR	A to 37% to 100° A to 70°	NR	A (PTFE Encapsulated 316 Stainless St.)	A 20% to 225° A to 50% to 150° B Conc. to 185°	A dilute to 250° A to 37% to 70° A 38-100 to 275°	A	A to 140°	A to 200°	A
Hydrochloric Acid (Muriatic Acid)	HCL	A to 40% to 140° NR 5-100% 175°	NR 3-100%	A to 10% to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 70° A to 36% to 150° A to 10% to 185°	A to 38% to 194° A to 50% to 175° AB 40-70% to 70°	A	A to 20% to 230° A to 25% to 140° AB 50-100% to 70°	A to 25% to 140° A to 37% to 130°	A
Hydrofluoric Acid	HF	A to 100% to 70° A 90% to 125°	A to 10% AB 16% to 120° NR 45-80%	A to 50% to 140° B 60-75% @70° NR 80-100% @ 70°	AB to 25% @ 70° NR 30-100% @ 70°	A (PTFE Encapsulated 316 Stainless St.)	A to 50% to 140° A to 40% to 200° A to 30% to 225°	A to 100% to 212°	A	A to 60% to 130° A to 50% to 176° AB to 60% to 130° A to 30% to 212°	A dilute to 212° AB to 60% to 130°	A
Hydrogen Peroxide (Hydrogen Dioxide)	H ₂ O ₂	A to 100% to 75° A to 50% to 200°	A to 30% to 104° A 50-100% to 70°	A to 10 to 200° AB to 30% to 100° NR 50-100% @ 70°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 80% to 70° A to 5% to 170° NR 30% > 125°	A to 200° A to 30% to 212°	A	A to 104° A 50% to 200° AB @ 100% @ 160°	B 5% to 140° B 3-30% @ 70°	A (White 571 & 592) AB (Black 550)
Iodine	I ₂	A	A 9-10% to 72° NR >10%	NR	BC @ 70°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% @ 75° AB to 100% @ 176°	A to 100% to 170° C 100% @ 212	A	A to 100% to 140°	AB to 160°	A
Isopropyl Alcohol (Isopropanol)	(CH ₃) ₂ CH-OH	A 100% to 212° A 47% to 356° A 11% to 70°	A to 100% to 140° A 100% to 212°	A to 200°	A to 75°	A (PTFE Encapsulated 316 Stainless St.)	A to 225°	A to 150° AB to 158°	A	A to 170° B @212°	A to 160° B @176°	A
Methyl Alcohol (Methanol) (Wood Alcohol)	CH ₃ OH	A to 212°	A	A to 150°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 70° BC 100 @ 180°	A to 148° AB 212-257°	A	NR	A to 160° AB to 176°	A
Methylene Chloride	CH ₂ CL ₂	A	A to 100% to 200° A to 90% to 212°	A 100% to 70°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	NR	AB to 100°	A	B @ 70°	BC to 130°	A
MINNCARE® Cold Sterilant (Hydr. Peroxide, Peracetic acid, Acetic acid)	H ₂ O ₂ C ₂ H ₄ O ₃ C ₂ H ₄ O ₂	A	A	A	A	A	A	AB	A	A	B	A
N-Methyl 2-Pyrrolidone	NMP CH ₃ N(CH ₂) ₃ CO	NO TEST RESULT	NO TEST RESULT	A to 70°	A	A (PTFE Encapsulated 316 Stainless St.)	A	C/NR @70°	A	NR	NR	A
Nitric Acid (Hydrogen Nitrate)	HNO ₃	A to 99% to 130° A to 50% to 140° AB 10% to 185°	A to 100% to 120° A to 60% to 175° A to 50% to boiling	A to 30% to 100° AB to 40% to 80° NR 50-100% @ 70°	A to 30% to 70° A to 10% to 212° NR 50% @ 70°	A (PTFE Encapsulated 316 Stainless St.)	A to 50% to 104° A to 30% to 180° A to 10% to 210°	A to 98% to 70° A to 90% to 140° A to 30% to 212°	A	A 50% to 140° A 90-100% to 158° AC 60-70% to 70°	A to 25% to 70° A to 10% to 104° B 25-30% to 140°	A
Oxalic Acid (Ethanedioic Acid)	C ₂ H ₂ O ₄	A to 100% to 140° A to 50% to Boil B 60-100% to Boil	A to 50% to 100° A 20-50 to 125° B 60-90% @ 70°	A	A	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 140° A to 50% to 180°	A to 100% to 125° A to 60% to 212° B @ 100% @ 158°	A	A to 100% to 140° A to 50% to 176°	A	A
Ozone (trioxygen)	O ₃	A 2% to 140°	A to 70° A 2% to 140°	NO TEST RESULT	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	NR	A	A	A to sat. to 70° NR sat @ 140°	A to sat. to 70° NR sat. @ 140	A (White 571 & 592) AB (Black 550)
Phosphoric Acid	H ₃ PO ₄	A to 200° A to 50% to boiling	A to 40% to 240° A to 70% to 150°	A	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 185° A to 75% to 225°	A A 85% to 230°	A	A to 140° A to 85% to 176° A 75% to 212°	A to 130° A to 85% to 176° B to 30% to 212°	A
Pyridine (Azine)	C ₅ H ₅ N	A to 100% to 100° A 100% to 140°	A to 100% to 212°	A to 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 75° AB 100% 120-180° NR 100% @ 120°	NR	A	NR	B to 160°	A

CHEMICAL		SPRING Materials					COUPLING Materials			SEAL Materials		
Name	Formula	Hastelloy C	316 SS	PPS	PEEK™	PTFE/316SS	Polypro	PVDF	PTFE/PFA	Viton®	EPDM	Chemraz®
PGME (Propylene Glycol Monomethyl Ether) (Dowtherm 209 / Dowanol PM)	C ₄ H ₁₀ O ₂	A	A	A	B	A (PTFE Encapsulated 316 Stainless St.)	A to 140° AB to 150°	AB	A	NR	A 50% to 70°	A
Potassium Hydroxide (Caustic Potash)	KOH	A to 50% to 200° AB 100% to 185°	A to 100% to 70° A to 70% to 150°	A to 200° A to 50% to 268°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	A A 70% to 185°	*A to 25% to 140° A to 10% to 280° A 60-100% to 212°	A	AB to 70° AB to 70% to 140° A 5% to 150°	A to 200° B 25% @ 212	A (Black 550) AB (White 571 & 592)
Potassium Permanganate	KMNO ₄	A to 50% to 75° AB 100% to 200° B to 30% 75-212°	A to 25% to 70° AB to 100% to 100° A 100% to 130°	A to 200°	A to 75°	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 70° A to 25% to 140° A to 10% to 180°	A	A	A to 140°	A to 200°	A
Sodium Hydroxide (Caustic Soda)	NaOH	A to 100% to 70° A to 50% to 200° AB 50-80% to 170°	A to 20% AB 20- 70% to 212° AB 70-100% to 125°	A to 100% to 70° A to 50% to 140° A to 20% to 200°	A to 100% to 70° A to 54% to 392°	A (PTFE Encapsulated 316 Stainless St.)	A to 125° A to 70% to 225°	A to 50% to 70° A to 20% to 104° A to 15% to 176°	A	B to 70° B 80% @140°	A to 70° A to 50% to 176° B 20% @ 212°	A (Black 550) AB (White 571 & 592)
Sodium Hypochlorite (Bleach)	CLNaO	A to 50% to 115° A to 20% to 140° AB @100% to 200	Generally NR A to 6% to 160° A sat'd to 200°	BC 5% to 200°	AB to 100%	A (PTFE Encapsulated 316 Stainless St.)	A to 100% to 70° A to 5% to 120° C 12% >70°	A to 17% AB to 100%	A	A to 100% to 130° BC 20% @ 158°	AB 20-100% to 130	A
STERIS® CIP 100 (Potassium Hydroxide & Tetrasodium EDTA)	Alkaline Cleaner KOH & C ₁₀ H ₁₂ N ₂ Na ₄ O ₈	A to 200°	A to 150°	A	A to 212°	A	A	A to 140°	A	AB to 140°	A to 200°	A (Black 550) AB (White 571 & 592)
STERIS® CIP 200 (Phosphoric Acid & Citric Acid)	Acid Cleaner H ₃ PO ₄ C ₆ H ₈ O ₇	A to 200°	A to 150°	A to 220°	A	A	A	A	A	A	A to 176°	A
Sulfuric Acid (Air-free) (Better when aerated)	H ₂ SO ₄	A to 60% to 70° A 90-100% to 100° (A to 100% to 140°)	A to 20% to 70° A 80-100% to 70° Sensetive to concen.	A 10-75% to 70° NR > 80% (Use Encap SS > 80%, PPS to 80% concentrations)	A to 40% to 212° NR > 40%	A (Encaps. 316ss)	*A to 10% to 212° A to 50% to 176° A to 90% to 104°	A to 90% to 212° A to 96% to 175° A to 98% to 120°	A	A to 158° A to 70% to 176° A to 50% to 212°	A to 90% to 70° A to 80% to 140° A 10% to 176°	A
Tetrahydrofuran (Tetramethylene Oxide)	C ₄ H ₈ O	A to 200°	A to 200°	A 100% to 140° C 100% @ 200°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	BC @ 70° C/NR @ 100-120° NR @ 140°	C 10-100% @ 70° NR @ 120°	A	NR	NR	A
Thionyl Chloride (Sulfinyl Chloride) (Sulforous Chloride)	CL ₂ OS	NO TEST RESULT	NR	NO TEST RESULT	A to 70°	A	B/NR 10 - 100% @ 70°	NR	A	AB to 70°	NR	A
Toluene (Toluol)	C ₇ H ₈	A to 212°	A 100% to 212°	A to 100°	A to 75°	A (PTFE Encapsulated 316 Stainless St.)	NR	A to 140° AB @ 176° BC 176-212°	A	A to 100° BC to 200°	NR	A
Trichloroacetic Acid (TCA)	C ₂ HCL ₃ O ₂	A 100% to boiling AB to 100% to boil.	NR	A to 200°	A to 68° (Fluoroware)	A (PTFE Encapsulated 316 Stainless St.)	A to 140° AB @ 150°	A to 75° A to 65% to 212° AB 104-125°	A	NR	B at 70°	A
Trichloroethylene (Ethylene Trichloride) (Triad)	C ₂ HCL ₃	B 90% to 212° A 100% to 212°	A 90% to 212° A 100 to 140°	AC 70-100° NR @ 200°	A to 212°	A (PTFE Encapsulated 316 Stainless St.)	NR	A to 189° (blackens)	A	NR	B	A
Xylene (Xylol)	C ₈ H ₁₀	A	A 75-100% A 50% to 220°	A to 200°	A to 70°	A (PTFE Encapsulated 316 Stainless St.)	NR	A to 175°	A	A to 140°	NR	A

WARNING:

The compatibility data was assembled from 3 main sources, a) the Chemical Resistance Guides published by COMPASS PUBLICATIONS ©, b) the Chemical Resistance guide published by VICTREX, the manufacturer of PEEK™ and c) the Entegris Chemical Compatibility Chart. **The table is to be used as a general guide only. Colder Products Company is not responsible for the accuracy of this data and assumes no obligation of liability in connection with its use. Therefore, CPC insists that all customers test and evaluate the suitability for use of CPC couplings in their particular application before using the couplings!**

NOTES:

- * PVDF may discolor after prolonged exposure in Potassium Hydroxide.
- * Polypropylene may discolor after prolonged exposure in Sulfuric Acid.

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