BTV2000 Elastomer Seat Energizers and Stem Compression Seals Selection Guide

This chart is intended only as a guide for the selection of elastomers for Durco BTV2000 Fluoropolymer or U.H.M.W.P.E. lined butterfly valves.

The recommendations may be used for selecting the most appropriate elastomer for the intended service but should not be considered a guarantee or blanket recommendation or for selecting the appropriate liner material. This chart is a compilation of published data and best judgment. The elastomers in the BTV2000 are normally not wetted parts and therefore do not come into contact with service media. However, should the non-metallic liner become damaged or breached due to improper installation or service conditions, compatibility with the media should be considered. The limitations of elastomers may dictate the use of an all-metal alloy Big Max BX2001 butterfly valve. Many factors must be considered when selecting an elastomeric material for a corrosive service. These include: concentration of all chemicals present; maximum, minimum and normal operating temperature; velocity; type and size of any solids present; continuous or intermittent operation; and any other peculiarities characteristic of the solution.

Key To Ratings

A = Excellent, little or no swelling or softening or surface deterioration.

B = Good chemical resistance. Minor chemical attack, swelling, softening or surface deterioration.

C = Limited chemical resistance. Moderate chemical attack. Conditional service.

NR = Severe attack, swelling, softening, or dissolved within minutes to months. Not recommended.

A to 70°F	≤ 15% volume increase or ≤ 15% loss of tensile strength at 100% concentration or concentrated saturated solution, to 70°F. Little or no chemical attack.
A to 100% to 70°F	≤ 15% volume increase or ≤15% loss of tensile strength in any concentration from 0 to 100% at 70°F. Little or no chemical attack.
A to 20% to 70°F	≤ 15% volume increase or ≤15% loss of tensile strength in any concentration from 0 to 20% at 70°F. Little or no chemical attack.
B 20-50% 70° to 140°F	≤ 15% to 30% volume increase or ≤15% loss of tensile strength, from 20-50% concentration of solution between 70° to 140°F.
B to conc to 212°F	≤ 15% to 30% volume increase or 15% to 30% loss of tensile strength, in any concentration to 100% at any temperature from 70° to 212°F.
A/C at 70°F	0% to 30% volume increase, or 0% to 30% loss of tensile strength at 100% concentration or concentrated, or saturated solution, at 70°F. Reported data varies widely possibly due to compounding differences within the same generic family.
NR or NR at 70°F	>50% volume increase or > 60% loss of tensile strength at 100% concentration, or concentrated, or saturated solution at 70°F. Severe attack. Not recommended.

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Media	Silicone Rubber	Viton A
Acetic acid	B to 70°F, NR Hot	B < 50% <100°F, NR Hot
Acetic anhydride	B/C to 70°F	B <50% to 70°F, NR Hot
Adipic acid	No data	A to 176°F, B to 212°F
Alcohols general	Test first	Test first
Amines	B/C to 70°F	NR
Ammonia gas hot/cold	A	NR
Ammonia anhydrous liqd.	B/C to 140°F, C to 240°F	NR
Ammonia aqueous liquid	A/B <30% to 70°F, C to 200°F	A/B <30% to 70°F
Ammonium chloride	B/C to 70°F	A to 212°F all concentr.
Ammonium nitrate	B/C to 70°F	A to 176°F all concentr.
Aniline	A/B to 70°F	A to 70°F, C to 158°F
Aniline	NR > 70°F	NR > 158°F
Aniline dyes	Test first	B to 70°F
Arsenic acid	A to 70°F, NR > 70°F	A to 140°F, B to 176°F
Barium carbonate	NR	A to 248°F
Barium chloride	A to 70°F	A to 248°F
Barium cyanide	NR	NR
Barium fluoride	NR	C to 70°F
Barium hydroxide	A to 70°F	A to 248°F
Beer	A to 70°F	A to 176°F
Beer wort	A/B to 70°F	A to 70°F
Benzoic acid	Test first	A to 176°F, B to 212°F
Black liquor	A to 70°F	A to 212°F
Black liquor waste	NR	A to 70°F
Bleach liquor	B to 70°F	A to 70°F
Boric acid	A to 70°F	A to 176°F, B to 212°F
Brine	A to 70°F	A to 248°F
Brine CaCl	A to 70°F	A to 70°F
Brine CuCl	A to 70°F	A to 70°F

Media	Silicone Rubber	Viton A
Brine NaCl	A to 70°F	A to 70°F
Brine sea water	A to 70°F	A to 248°F
Brine acid	NR	A to 70°F
Bromine anhydrous liquid	C to 70°F	A to 70°F, A/B to 212°F
Bromine gas	NR	A to 200°F wet or dry
Cadmium cyanide	NR	A to 70°F, A/B to 200°F
Calcium bisulfate	A/C to 70°F	A to 70°F
Calcium bisulfide	C to 70°F	A to 140°F, B to 176°F
Calcium chloride	A 50-100% to 70°F	A to140°F, A/B 176°-212°F
Calcium hypochloride	NR	A to 70°F
Calcium hypochlorite	B 35-100% to 70°F	A to 70°F, A/B to 200°F
Carbolic acid	NR	A to 140°F, A/B to 200°F
Carbon Disulfide	NR	A to 140°F, A/B to 185°F
Carbon tetrachloride	NR	A to 158°F, B to 250°F
Carbonic acid	A to 70°F	A to 176°F, A/B 185°-212°F
Caustic soda	A - 10% to 75°F	A (solution) to 70°F
Caustic soda	B - 10 - 50% to 70°F	NR 15-30% to 150°F
Chlorinated salt brine	NR	A to 70°F
Chlorinated solvents	NR	A to 200°F
Chlorine dry	NR	A to 70°F, A/B to 400°F
Chlorine wet	NR	A to 70°F, B/C to 300°F
Chlorine water	NR	C 400ppm to 70°F
Chlorine water	NR	NR 400ppm to 104°F

Media	Silicone Rubber	Viton A
Chloracetic acid	NR	B 50-100% to 70°F
Chloracetic acid	NR	C 100% to 104°F
Chlorobenzine, mono	NR	A to 200°F
Chlorobenzine, Di, Tri	NR	A to 200°F
Chloroethane	C to 70°F	A to 70°F
Chlorosulfonic acid	NR	NR wet, C to 70°F dry
Chlorothene	NR	A/C to 70°F
Chromic acid	A 10% @ 70°F	A (conc) to 70°F
Chromic acid	C 5%-50% to 70°F	A (conc) to 70°F
Citric acid	A to 70°F	A (conc) to boiling
Copper arsenate, basic	NR	A to 70°F
Copper cyanide	A to 70°F	A to boiling
Copper nitrate	NR	A to 70°F
Copper sulfate	A to 100% to 70°F	A to conc to 70°F
Cupric chloride	A to 70°F	A to conc to 212°F
Cupric nitrate	NR	A to 70°F
Deionized water	No data	A to 70°F, A/B to 200°F
DMP Dimethal phthalate	NR	A to 70°F, B to 250°F
DMT Dimethal trpthalate	NR	A to 70°F, B to 230°F
Ethyl dichloride	C/NR to 70°F	A/B to 70°F
Ethylene glycol	A to 70°F	A to 250°F
Fatty acids	C to 70°F	A to 145°F
Ferric chloride	A/B to conc to 70°F	A to 176°F, B to 212°F
Formaldehyde	B to 70°F	A (conc) to 176°F
Formaldehyde	B to 70°F	A to 37% to 212°F

Media	Silicone Rubber	Viton A
Formic acid	B/C to 70°F	NR
Glycerin	A to 70°F	A to 250°F
Glycols general	A to 70°F	A to 70°F
Green liquor	A to 70°F	A to 70°F
Green sulfate liquor	A to 70°F	A to 176°F, B to 212°F
Hydrobromic acid	NR 20-100% to 70°F	A to 100% to 140°F
Hydrobromic acid	NR 20-100% to 70°F	B 20% to 176°F
Hydrobromic acid gas	NR	A to 120°F
Hydrochloric acid	NR 100% to 70°F	A/B 50-100% to 70°F
Hydrochloric acid	B/C 50% to 70°F	A to 37% to 130°F
Hydrochloric acid	B/NR 38% to 70°F	A to 25% to 140°F
Hydrochloric acid	A/B to 20% to 70°F	NR 38% to 140°F
Hydrocyanic acid	A/C to 70°F	A to 100% to 140°F
Hydrofluoric acid	B/NR 20%-50% to 70°F	A/B (conc) to 120°F
Hydrofluoric acid	NR 65%-100% to 70°F	A to 60% to 130°F
Hydrofluoric acid	NR 65%-100% to 70°F	A to 50% to 176°F
Hydrofluoric acid	NR 65%-100% to 70°F	B 50% to 212°F
Hydrofluoric acid	NR 65%-100% to 70°F	C 50% to 248°F
Hydrofluoric acid	NR 65%-100% to 70°F	A to 30% to 212°F
Hydrogen chloride gas	NR	A to 70°F wet or dry
Hydrogen cyanide	A/C to 70°F	A to 100% to 140°F
Hydrogen fluoride	NR	A to 120°F
Hydrogen peroxide	B 90% at 70°F	A to 100% to 104°F
Hydrogen peroxide	B/C 100% to 70°F	A/B 100% to 160°F

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Media	Silicone Rubber	Viton A
Hydrogen peroxide	B 90% to 160°F	NR 100% to 240°F
Hydrogen peroxide	A/B to 50% to 125°F	A 50% to 200°F
Hydrogen peroxide	A to 30% to 70°F	C 10-30% to 104°F
Hydrogen peroxide	A to 30% to 70°F	A 5% to 176°F
Hypo	A to 70°F	A to 70°F
Hypochlorous acid	NR	A to 100% to 70°F
Hypochlorous acid	NR	B 10% to 176°F
Iodine	C to 70°F	A (conc) to 140°F
Isocyanates	No data	A/B to 70°F
Lactic acid	A to 70°F	A to 100% to 140°F
Lactic acid	B to 140°F	A to 80% to 176°F
Lactic acid	A to 70°F	B 80% to 212°F
Lactic acid	B to 140°F	A to 25% to 212°F
Lead acetate	NR	A to 140°F, B to 176°F
Lead nitrate	B to 70°F	A to 212°F
Maleic acid	No data	A to 70°F
Malic acid	B at 70°F	A to 140°F, B to 176°F
Manganese chloride	A/C to 70°F	A to 70°F
Mercuric chloride	A (conc) to 70°F	A to 140°F
Mine water	A/B to 70°F	A to 180°F
Muriatic acid	NR 100% to 70°F	A/B 50-100% to 70°F
Muriatic acid	B/C 50% to 70°F	A to 37% to 130°F
Nickel chloride	A to 70°F	A to 212°F
Nickel sulfate	A to 70°F	A to 70°F
Nitric acid all	Test first	Test first
Nitrobenzene	C/NR to 70°F	A to 70°F

Media	Silicone Rubber	Viton A
Oleic acid	NR	A to 212°F, B to 248°F
Oleum	NR	B to 140°F
Prechloric acid	NR	A to 100% to 70°F
Phenol	NR 10% to 100% to 70°F	A to 100% to 140°F
Phosphoric acid	B/C 20% to 70°F	A to 100% to 140°F
Phosphoric acid	C 10% to 158°F	B 100% to 185°F
Phosphoric acid	NR 50-100% to 70°F	A to 85% to 176°F
Phosphoric acid	NR 100% to 158°F	B 85% to 212°F
Phosphoric acid crude	C to 70°F	A to 140°F
Phthalic acid	A/B to 70°F	A to 70°F
Picric acid	NR	A (conc) to 70°F
Picric acid	NR	A 10% to 140°F
Picric acid	NR	C 10% to 104°F
Picric acid	NR	NR 10% to 140°F
Poly glycols	A to 70°F	A to 70°F
Potash caustic	C 50-100% to 70°F	A/B to 70°F, NR to 140°F
Potash caustic	A/B 1% to 70°F	A/B to 70°F, NR to 140°F
Potassium bisulfate	No data	A to 212°F
Potassium chloride	A to 70°F	A to 212°F
Potassium hydroxide	A/B 1% to 70°F	A/B to 70°F
Potassium hydroxide	C 50-100% to 70°F	C 30-50% to 175°F
Potassium hydroxide	C 50-100% to 70°F	NR 30% to 212°F
Potassium hydroxide	C 50-100% to 70°F	A 5% to 150°F
Potassium iodide	No data	A to 70°F, NR to 140°F

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Media	Silicone Rubber	Viton A
Potassium nitrate	A to 70°F	A to 100% to 212°F
Potassium sulfate	A to 70°F	A to 100% to 70°F
Resorcinol	No data	A to 70°F
Salicylic acid	No data	A to 70°F
Salt solution	A to 70°F	A to 200°F
Salt water	A to 70°F	A to 176°F A/B to 200°F
Soda ash	A to 100% to 70°F	A to 100% to 212°F
Sodium bicarbonate	A to 100% to 70°F	A to 100 % to 212°F
Sodium bichromate	No data	A to 212°F
Sodium bidulfite	A/C 100% to 70°F	A to 212°F
Sodium chlorate	C at 70°F	A to 140°F, A/B to 200°F
Sodium chloride	A/B to 212°F	A to 212°F
Sodium chlorite	No data	NR > 25% to 70°F
Sodium cyanide	A to 70°F	A to 176°F - B 176-200°F
Sodium ferricyanide	No data	A to 140°F
Sodium ferrocyanide	No data	A to 140°F
Sodium hydroxide	A to conc to 70°F	B 100% to 70°F
Sodium hydroxide	A 1% to conc to 70°F	NR 100% to 104°F
Sodium hydroxide	A 20% to 212°F	B 80% to 140°F
Sodium hydroxide	A 20% to 212°F	C/NR 40-80% to 175°F
Sodium hydroxide	A 20% to 212°F	A/C 15-50% to 140°F
Sodium hydroxide	A 20% to 212°F	NR 15-30% to 150°F
Sodium hypochlorite	B 100% to 70°F	A to conc to 130°F
Sodium hypochlorite	B 100% to 70°F	B/C 20% to 158°F
Sodium hypochlorite	B 100% to 70°F	NR 5% to 140°F
Sodium nitrate	NR	A to 212°F
Sodium sulfates	A to 100% to 70°F	A to 100% to 212°F
Sodium sulfide	A to 100% to 70°F	A to 100% to 176°F
Sodium sulfide	A to 100% to 70°F	B 177°F to 212°F
Sodium sulfite	A to 100% to 70°F	A to 100% to 140°F
Sodium sulfite	A to 100% to 70°F	A/B to 100% to 200°F
Sodium thiophosphates	A <100% 70°F/AB 125°F	A to 100% to 212°F
Solvents general	No data	A/B to 70°F
Stannic chloride	B 50-100% to B 50 100% to 70°F	A to 100% to 140°F
Stannic chloride	B 50-100% to 70°F	A/B to 200°F
Stannous chloride	B 15-100% to 70°F	A to 100% to 70°F
Stearic acid	B to 70°F	A to 140°F, B/C to 158°F
Sulfate liquors grn. & blk.	A/B to 70°F	A to 176°F, B to 212°F
Sulfite liquors	NR to 70°F	A to 70°F, A 6% to 140°F
Sulfur chloride	C to 70°F	A to 140°F
Sulfur dioxide gas dry	A/B to 70°F	A to 250°F
Sulfur dioxide gas wet	B to 70°F	A to 140°F B/NR to 176°F
Sulfuric acid	NR 25-100% to 70°F	A to 100% to 158°F
Sulfuric acid	B/NR 10% to 70°F	NR 95% to 212°F
Sulfuric acid	B/NR dilute to 70°F	B 80-90% 176-212°F
Sulfuric acid	B/NR dilute to 70°F	NR 80-90% to 248°F
Sulfuric acid	B/NR dilute to 70°F	A to 70% to 176°F

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Media	Silicone Rubber	Viton A
Sulfuric acid	B/NR dilute to 70°F	B 60-70% to 212°F
Sulfuric acid	B/NR dilute to 70°F	C 60-70% to 248°F
Sulfuric acid	B/NR dilute to 70°F	A to 50% to 212°F
Sulfuric acid	B/NR dilute to 70°F	B 50% to 248°F
Sulfuric acid	B/NR dilute to 70°F	A to 30% to 248°F
Sulfurous acid	NR to 70°F	A to 140°F B to 200°F
Sulfurous acid	NR to 70°F	C/NR to 212°F
Sulfurous acid	NR to 70°F	A to 75% to 70°F
Tannic acid	B to 100% to 70°F	A to 100% to 140°F
Tannic acid	B to 100% to 70°F	A/B to 200°F

Media	Silicone Rubber	Viton A
Tartaric acid	A to 70°F	A to 140°F, A/B to 200°F
Tetrachloroethane	NR	A to 200°F
Tetrachloroethylene	NR	A to 200°F
Toluene	NR 30% to 100% to 70°F	A to 100°F to B/C to 200°F
Trichloroethane	NR	A to 140
Turpentine	NR	A to 158°F
Urea	A/B to 70°F	A to 70°F, A/B to 200°F
Vinyl acetate	NR	A to 70°F
Vinyl fluoride	No data	A to 70°F
Water deionized	No data	A to 70°F, A/B to 200°F
White liquor	No data	A to 140°F
Zinc chloride	A/B to 100% to 70°F	A to 100% to 212°F
Zinc sulfate	A to 70°F	A to 100% to boiling

For more information, contact:

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