

CORROSION RESISTANCE

against high corrosive process media

Media			Wetted parts							Seal						
Corrosive media	% Concentration	Temperature °C	99.9% Al ₂ O ₃ ceramic**	316L / 1.4435	Hastelloy (C-276)	Monel (400)	Tantalum	Titanium (poss. +2% Pd)	Nickel TSP-option	PTFE	Kalrez / Chemraz	EPDM (synt.rubber)	Viton FPM	Neoprene CR	Perbuan NBR	
			Ketones													
Acetone CH ₃ -CO-CH ₃	100	RT	A	A	A	A	A	A	A	A	A	A	C	C	C	
(Dimethylceton)	100	S	A	A	A	A	A	A	A	A	A	A	C	C	C	
Ammonia gas	conc.	Rt	A	A	A	C	A	A	C	A	A	A	C	A	A	
Ammonia liquid NH ₃	conc.	100	A	A	A	C	A	A	C	A	A	B	C	B	C	
Ammonia Solution NH ₃	10	Rt	A	A	A	C	A	A	C	A	A	C	B	A	B	
unorg. lyes	10	s	A	C	A	C	C	A	C	A	A	C	B	A	B	
	20	s	A	C	A	C	C	A	C	A	A	C	B	A	B	
	25	s	A	C	A	C	C	A	C	A	A	C	B	A	B	
	conc.	Rt	A	A	A	C	A	A	C	A	A	C	B	A	B	
	conc.	100	A	C	A	C	A	A	C	A	A	C	B	A	B	
Acetic acid CH ₃ -COOH	10	Rt	A	A	A	A	A	A	C	A	A	C	C	A	C	
org.acid	10	s	A	A	A	A	A	A	C	A	A	C	C	A	C	
	50	Rt	A	A	A	A	A	A	C	A	A	C	C	A	C	
	50	s	A	A	A	A	A	A	C	A	C	C	C	A	C	
	conc.	Rt	A	A	A	A	A	A	C	A	C	C	C	A	C	
	conc.	s	A	C	A	A	A	A	C	A	C	C	C	A	C	
Chlorine gas wet Cl ₂	100	Rt	A	C	A	C	A	B	A	A	N	N	A	C	C	
Chlorine Cl ₂	100	Rt	A	A	A	C	A	C	A	A	C	C	A	C	C	
Chloracetic acid CH ₂ Cl-COOH	50	20	A	C	A	A	A	A	A	A	C	C	C	C	C	
		70	A	C	A	B	A	A	B	A	C	C	C	C	C	
		100	A	C	A	B	A	A	B	A	C	C	C	C	C	
		100	A	C	A	B	A	A	B	A	C	C	C	C	C	
Chlorosulfonic acid SO ₂ (OH)Cl	100	Rt	A	A	A	B	A	C	B	A	C	A	C	C		
Formic acid H-COOH	org.acid	10	A	A	A	A	A	A	A	A	C	A	B	B	C	
		10	A	A	B	B	A	A	B	A	C	B	B	B	C	
		10	A	A	C	C	A	A	C	A	C	B	B	B	C	
		20-40	A	A	B	C	A	A	C	A	C	B	B	B	C	
		50	A	A	A	A	A	A	A	A	C	C	B	B	C	
		50	A	A	C	C	A	C	C	A	C	C	B	B	C	
		80	A	A	A	A	A	A	A	A	C	A	B	B	C	
		80	A	C	B	C	A	B	C	A	C	C	B	B	C	
		80	A	C	C	C	A	C	C	A	C	A	B	B	C	
		conc.	Rt	A	A	A	A	A	A	A	A	C	A	B	B	C
		conc.	s	A	C	C	C	A	C	C	A	C	C	B	B	C
Hydrofluoric acid HF	1	Rt	A	C	A	A	C	C	A	A	C	A	B	C		
unorg.acid	40	Rt	A	C	A	A	C	C	A	A	C	A	B	C		
	40	50	C*	C	A	A	C	C	B	A	A	C	A	C		
	50	Rt	A	C	A	A	C	C	A	A	C	A	B	C		
	Hydrogen fluoride HF gas	100	Rt	C*	C	A	A	C	C	A	A	C	A	C	C	

According to Philips (1/88) to ASV Stübbe and to Du Pont (Kalrez)

* recommended option: Sapphire membrane (A = fully resistant)

** for 96% ceramic see Philips table

A	fully resistant
B	sufficient resistant
C	not resistant
N	no data available

Rt : room temperature

s : boiling

conc. : concentrated

sat. : saturated

This list constitutes a non-binding recommendation from which no warranty claims whatsoever can be derived !

Media			Wetted parts							Seal					
Corrosive media	% Concentration	Temperature °C	99.9% Al ₂ O ₃ ceramic**	316L / 1.4435	Hastelloy (C-276)	Monel (400)	Tantalum	Titanium (poss. +2% Pd)	Nickel TSP-option	PTFE	Kalrez / Chemraz	EPDM (synt.rubber)	Viton FPM	Neoprene CR	Perbuan NBR
			Sodium hydroxide (Caustic soda) NaOH unorg.lyes	10 10 20 20 50 50 sat.	Rt s Rt s Rt s s	A A A A A A A	A A A A A A A	A A A A A A B	A A A A A A C	A A A B B B C	A A A A A B A	A A A A A A A	A A A A A A A	A A A C C C C	C C C C C C C
Oleum H ₂ SO ₄ + SO ₃ (vitriolic acid) unorg.acid	conc. conc.	Rt 50	A A	B B	A B	A B	A C	C C	A B	A N	N C	C A	A C	C C	C C
Phosphoric acid H ₃ PO ₄ unorg.acid	10 10 45 45 conc. conc.	Rt s Rt s Rt 100	A A A A A A	A C A C C C	A A A A B C	A C C C A C	A A A A B C	A C C C B C	A A A A A A	A A A A A A	A A A C A A	A A A C A A	A A A A A A	B C B B B C	
Nitric acid HNO ₃ unorg.acid	25 25 50 50 70	Rt s Rt s 100	A A A A A	A A A A C	A C A C C	A C A A C	A A A A A	A B A B A	C C C C C	A A A A A	A C C C C	A C C C C	B B B B B	C C C C C	
Hydrochloric acid HCl unorg.acid	10 10 10 20 20 37 37	Rt 50 s Rt s Rt 100	A A A A A A A	C C C C C C C	A C C A C C C	A C C A C C C	A A A A A C C	B C C B C C C	A A A A A A A	A A A A A A A	A C C A C C	A A A A A A A	B B C B B B C	C C C C C C C	
Hydrochloric acid+nitric acid HCl : HNO ₃ (3:1) Aqua Regia) unorg.acid	conc.	Rt	A	C	B	C	A	A	C	A	B	B	B	C	C
Sulfuric acid H ₂ SO ₄ unorg.acid	10 10 50 50 96 96	Rt s Rt s Rt 100	A A A A A A	A C B B C C	A A A A C C	A A A A C C	A A A A C C	A B B B C C	A C C C C C	A A A A A A	A B A A C C	A C A A A A	C C C C C C	C C C C C C	
Sulfuric acid+nitric acid H ₂ SO ₄ : HNO ₃	10 90 50 50 90 10	35 35 35	A A A	N N N	A A A	C C C	A A A	A A B	C C C	A A A	N N N	N N A	B B A	C C C	
Zinc chloride ZnCl ₂	10 10 60 60 sat.	Rt s Rt s s	A A A A A	A A A A C	A A A B B	A A A B B	A A A A A	A A A B C	A B B B B	A B A A A	A A A A A	A A A A A	A A A A A	B B B B B	

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 * recommended option: Sapphire membrane (A = fully resistant)
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