

The background of the page features a large, curved, microscopic view of a ceramic surface. The surface is light beige and shows a series of parallel, rounded ridges. The background behind the ridges is a vibrant green, with a pattern of small, circular, bubble-like structures. A large, solid red diagonal shape cuts across the bottom right of the image.

CORROSION RESISTANCE

High-performance ceramics

OXIDE CERAMIC MATERIALS

F99.7

Pure Al_2O_3 , dense, extremely resistant to wear and corrosion, very high electrical insulating properties.

DEGUSSIT AL23

Pure Al_2O_3 , dense, excellent thermal and electrical properties, corrosion resistant.

FZT

Al_2O_3 doped with ZrO_2 , dense, high strength, good resistance to thermal shock, extremely resistant to wear and corrosion, fine grain size.

FZM

ZrO_2 partially stabilized with MgO , dense, high strength and wear resistance, extremely resistant to corrosion and thermal shock.

FZM+

ZrO_2 partially stabilized with MgO , dense, very high flexural strength and fracture toughness, high wear resistance, extremely resistant to corrosion and thermal shock.

The following tables show the corrosion properties of oxide ceramics and other special materials. These data are based on chemical conditions as far as we know them.

To a large extent the corrosion resistance data of the different materials result from laboratory tests. Generally, however, corrosive conditions in practical operation are essentially more differentiated. The smallest portions of an intermediate product appearing only for a short time may finally determine corrosive attacks.

In cases where a particular application cannot be based on reliable experiences, the corrosion resistance of our materials is to be determined by test specimens under process conditions.

Get in touch with us for your request of our latest brochures and product programme. With Kyocera's high-performance ceramics we ensure you the highest quality and function for your products and applications.

ABBREVIATIONS:

A	resistant
B	weak reaction
C	strong reaction
rt	room temperature
b	boiling
conc.	concentrated
sat.	saturated
Empty cells	no data available

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon	
				F99.7 AL23	FZM FZM+	FZT									
Acetaldehyde	CH ₃ CHO		rt	A	A	A	A	A	C	C	C	B	B	C	
Acetic acid	CH ₃ COOH	5	rt	A	A	A	A	A	C	C	A	B	B	B	
		5	b	A	A	A	A	A	C	C	A	B	B	B	
		10	rt	A	A	A	A	A	C	C	A	B	B	B	
		10	b	A	A	A	A	A	C	C	A	B	B	B	
		50	rt	A	A	A	A	A	C	C	A	B	B	B	
		50	b	A	A	A	A	A	C	C	A	B	B	B	
		80	rt	A	A	A	A	A	C	C	A	B	B	B	
		80	b	A	A	A	A	A	C	C	A	B	B	B	
		conc.	rt	A	A	A	A	A	C	C	A	B	B	B	
		conc.	b	A	A	A	A	A	C	C	A	B	B	B	
Acetic acid anhydride	(CH ₃ CO) ₂ O		rt	A	A	A	A	A	C	C	A	B	B	B	
Acetone	CH ₃ CHOCH ₃	100	rt	A	A	A	A	A	C	C	B	B	A	C	
Alum	K ₂ Al ₂ (SO ₄) ₄	10	rt	A	A	A	A	A	A	B	A	A	A	A	
Aluminium chloride	AlCl ₃	10	rt	A	A	A	A	A	A	A	B	A	B	A	A
		10	100	A	A	A	A	A	A	A	B	A	B	A	A
		25	60	A	A	A	A	A	A	A	B	A	B	A	A
		25	100	A	A	A	A	A	A	A	B	A	B	A	A
		80	b	A	A	A	A	A	A	A	B	A	B	A	A
Aluminium sulfate	Al ₂ (SO ₄) ₃	10	rt	A	A	A	A	A	A	A	B	A	A	A	A
		10	b	A	A	A	A	A	A	A	B	A	A	A	A
		15	50	A	A	A	A	A	A	A	B	A	A	A	A
		20	55	A	A	A	A	A	A	A	B	A	A	A	A
		25	b	A	A	A	A	A	A	A	B	A	A	A	A
		50	b	A	A	A	A	A	A	A	B	A	A	A	A
		55	40	A	A	A	A	A	A	A	B	A	A	A	A
57	120	A	A	A	A	A	A	A	B	A	A	A	A		
Ammonia, Ammonium hydroxide	NH ₃ NH ₄ OH	10	rt	A	A	A	A	A	A	B	B	A	A	A	A
		10	b	A	A	A	A	A	A	B	B	A	A	A	A
		20	b	A	A	A	A	A	A	B	B	A	A	A	A
		25	b	A	A	A	A	A	A	B	B	A	A	A	A
		conc.	rt	A	A	A	A	A	A	B	B	A	A	A	A
		conc.	100	A	A	A	A	A	A	B	B	A	A	A	A
Ammonium bromide	NH ₄ Br	10	25	A	A	A	A	A	A	A	A	A	A	A	
Ammonium carbonate	(NH ₄) ₂ CO ₃	10-20	b	A	A	A	A	A	A	A	B	A	A	A	A
		30	80	A	A	A	A	A	A	A	B	A	A	A	A
		30	b	A	A	A	A	A	A	A	B	A	A	A	A
		40	b	A	A	A	A	A	A	A	B	A	A	A	A
		50	b	A	A	A	A	A	A	A	B	A	A	A	A
		sat.	rt	A	A	A	A	A	A	A	B	A	A	A	A
		sat.	b	A	A	A	A	A	A	A	B	A	A	A	A
Ammoniumchloride	NH ₄ Cl	10	rt	A	A	A	A	A	A	A	A	A	A	A	A
		10	b	A	A	A	A	A	A	A	A	A	A	A	A
		25	rt	A	A	A	A	A	A	A	A	A	A	A	A

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
		25	b	A	A	A	A	A	A	A	A	A	A	A
		50	rt	A	A	A	A	A	A	A	A	A	A	A
Ammonium chloride	NH ₄ Cl	50	b	A	A	A	A	A	A	A	A	A	A	A
		sat.	rt	A	A	A	A	A	A	B	A	A	A	A
		sat.	b	A	A	A	A	A	A	B	A	A	A	A
Ammonium fluoride	NH ₄ F	20	80				A				A	A		
Ammonium hydroxide	NH ₄ OH	28	20-60	A	A	A	A	A	B	B	A	A	A	A
Ammonium nitrate	NH ₄ NO ₃	10	rt	A	A	A		A	A	B	A	A	A	A
		20	rt	A	A	A		A	A	B	A	A	A	A
		20	rt	A	A	A		A	A	B	A	A	A	A
		50	rt	A	A	A		A	A	B	A	A	A	A
		50	b	A	A	A		A	A	B	A	A	A	A
Ammonium sulfate	(NH ₄) ₂ SO ₄	all	rt	A	A	A	A	A	A	B	A	A	A	A
		all	b	A	A	A	A	A	A	B	A	A	A	A
Aniline	C ₆ H ₅ NH ₂		rt	A	A	A	A	A	A	C	C	B	A	C
			b	A	A	A	A	A	A	C	C	B	A	C
Aqua regia	HCl:HNO ₃	3:1	rt	A	A	A	A	A	B	C	C	C	C	B
Arsenic acid	H ₃ AsO ₃		rt	A	A	A	A	A	A	B	A	A	A	A
Barium chloride	Ba(OH) ₂	20	rt	A	A	A	A	A	A	A	A	A	A	A
		20	100	A	A	A	A	A	A	A	A	A	A	A
Barium hydroxide	Ba(OH) ₂	sat.	rt	A	A	A	A	A		A	A	A		
		sat.	b	A	A	A	A	A						
Benzenesulfonic acid	C ₆ H ₅ SO ₃ H		70	A	A	A	A	A				A		
Benzoic acid	C ₆ H ₅ COOH	all	rt	A	A	A	A	A				A		
Benzol, Benzene	C ₆ H ₆		rt	A	A	A	A	A	A	C	C	C	C	C
Boric acid	H ₃ BO ₃	10	b	A	A	A	A	A	A	B	A	A	A	A
		50	b	A	A	A	A	A	A	B	A	A	A	A
Bromide	Br	dry	rt	A	A	A	C	A	B	C	C	C	C	B
			b	A	A	A	C	A	B	C	C	C	C	B
Butyl acetate	C ₆ H ₁₂ O ₂		rt	A	A	A	A	A	C	C	C	C	B	C
Butyl alcohol	C ₄ H ₉ OH		rt	A	A	A	A	A	A	B	A	A	A	B
			b	A	A	A	A	A	A	B	A	A	A	B
Butyric acid	C ₃ H ₇ COOH	100	rt	A	A	A	A	A			A	A		
		100	b	A	A	A	A	A			A	A		
Calcium bisulfite	Ca(HSO ₃) ₂		rt	A	A	A	A	A	A	C	B	B	A	A
Calcium hypochlorite	CaCl ₂ O ₂	20	40	A	A	A	A	A	A	C	B	C	C	A
Calcium nitrate	Ca(NO ₃) ₂		rt	A	A	A	A	A	A	B	A	A	A	A
Calcium sulfate	CaSO ₄	1-5	rt	A	A	A	A	A	A	B	A	A	A	A
		10	b	A	A	A	A	A	A	B	A	A	A	A
Carbon disulfide	CS ₂		rt	A	A	A	A	A	A	C	C	C	C	C
			b	A	A	A	A	A	A	C	C	C	C	C
Carbon tetrachloride	CCl ₄		rt	A	A	A	A	A	B	C	C	C	C	C
Carnallite	MgCl ₂ KCl ₆ H ₂ O		90	A	A	A	A	A	A	B	A	A	A	A
Chloral	CCl ₃ CHO		50	A	A	A	A	A						
Chloride	Cl ₂	dry	rt	A	A	A	A	A	A	C	C	C	B	B

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM+ FZM+	FZT								
			70	A	A	A	C	A	A	C	C	C	B	B
Chloride	CH ₃ +H ₂ O>0,6%	moist	rt	A	A	A	A	A	A	C	C	C	C	B
			100	A	A	A	C	A	A	C	C	C	C	B
Chloroacetic acid	CH ₂ ClCOOH	50	20	A	A	A	A	A	C	C	C	C	B	B
			70	A	A	A	A	A	C	C	C	C	B	B
Chloroacetic acid	CH ₂ ClCOOH	100	rt	A	A	A	A	A	C	C	C	C	B	B
			100	A	A	A	A	A	C	C	C	C	B	B
Chlorobenzene	C ₆ H ₅ Cl		20	A	A	A	A	A	B	C	C	C	C	C
Chlorosulfonic acid	SO ₂ (OH)Cl		rt	A	A	A	A	A	C	C	C	C	C	C
			b	A	A	A	C	A	C	C	C	C	C	C
Chromium acid	H ₂ CrO ₄	10	rt	A	A	A	A	A	A	C	C	C	C	B
			10	A	A	A	C	A	A	C	C	C	C	B
			50	A	A	A	C	A	A	C	C	C	C	B
			50	A	A	A	C	A	A	C	C	C	C	B
Citric acid	C ₆ H ₈ O ₇	5	rt	A	A	A	A	A	A	B	A	A	A	A
			5	A	A	A	A	A	A	B	A	A	A	A
			25	A	A	A	A	A	A	B	A	A	A	A
			25	A	A	A	A	A	A	B	A	A	A	A
			50	A	A	A	A	A	A	B	A	A	A	A
			50	A	A	A	A	A	A	B	A	A	A	A
Copper sulfate	CuSO ₄	5	rt	A	A	A	A	A	A	A	A	A	A	A
			5	A	A	A	A	A	A	A	A	A	A	A
			25	A	A	A	A	A	A	A	A	A	A	A
			50	A	A	A	A	A	A	A	A	A	A	A
			all	A	A	A	A	A	A	A	A	A	A	A
Copper-(II)-chloride	CuCl ₂ • 2H ₂ O	20	rt	A	A	A	A	A	A	A	A	A	A	A
			20	A	A	A	A	A	A	A	A	A	A	A
			40	A	A	A	A	A	A	A	A	A	A	A
			50	A	A	A	A	A	A	A	A	A	A	A
			sat.	A	A	A	A	A	A	A	A	A	A	A
Dichloro ethane	C ₂ H ₄ Cl ₂	100	50	A	A	A	A	A		C		C		
Dichloro ethylene	C ₂ H ₂ Cl		b	A	A	A	A	A				C		
Dioxane	O ₂ (CH ₂) ₄			A	A	A	A	A		C	C	C	C	
Diphenyl	C ₆ H ₅ C ₆ H ₅			A	A	A	A	A	C	C	C	C	C	
Ether	(C ₂ H ₅) ₂ O		rt	A	A	A	A	A	C	C	C	C	C	C
Ethylacetate	CH ₃ COOC ₂ H ₅		rt	A	A	A	A	A	C	C	C	C	B	C
Ethylalcohol, Ethanol	C ₂ H ₅ OH		rt	A	A	A	A	A	A	B	A	A	A	A
Ethylchloride	C ₂ H ₅ Cl		rt	A	A	A	A	A	B	C	C	C	C	C
Ferric nitrate	Fe(NO ₃) ₃	all	rt	A	A	A	A	A	A	B	A	B	A	A
Ferric-(II)-Chloride	FeCl ₂	30	100	A	A	A	A	A	A	B	A	B	A	A
			10	A	A	A	A	A	A	B	A	B	A	A
			30	A	A	A	A	A	A	B	A	B	A	A
			50	A	A	A	A	A	A	B	A	B	A	A
			sat.	A	A	A	A	A	A	B	A	B	A	A
Ferric-(II)-Sulfate	FeSO ₄ • 7H ₂ O	10	rt	A	A	A	A	A	A	B	A	B	A	A

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
		all	b	A	A	A	A	A	B	A	B	A	A	
Ferric-(III)-Chloride	FeCl ₃	5	25	A	A	A	A	A	B	A	B	A	A	
		10	65	A	A	A	A	A	B	A	B	A	A	
		15	25	A	A	A	A	A	B	A	B	A	A	
		45	25	A	A	A	A	A	B	A	B	A	A	
		50	50	A	A	A	A	A	B	A	B	A	A	
		50	b	A	A	A	A	A	B	A	B	A	A	
Ferric-(III)-Sulfate	Fe(SO ₄) ₃		rt	A	A	A	A	A	B	A	B	A	A	
		til 30	til 65	A	A	A	A	A	B	A	B	A	A	
Flourosilic acid	H ₂ SiF		rt	A	B	A	A			A	A			
Formaldehyde	CH ₂ O	30	30	A	C	A	A			A	A			
		all	til b	A	A	A	A	A	B	A	A	A	A	
Formic acid	HCOOH	10	rt	A	A	A	A	A	B	C	B	B	A	A
		10	65	A	A	A	A	A	B	C	B	B	A	A
		10	b	A	A	A	A	A	B	C	B	B	A	A
		20-40	65	A	A	A	A	A	B	C	B	B	A	A
		50	rt	A	A	A	A	A	B	C	B	B	A	A
		50	b	A	A	A	A	A	B	C	B	B	A	A
		60	65	A	A	A	A	A	B	C	B	B	A	A
		80	rt	A	A	A	A	A	B	C	B	B	A	A
		80	65	A	A	A	A	A	B	C	B	B	A	A
		80	b	A	A	A	A	A	B	C	B	B	A	A
		90	100	A	A	A	A	A	B	C	B	B	A	A
		conc.	rt	A	A	A	A	A	B	C	B	B	A	A
		conc.	b	A	A	A	A	A	B	C	B	B	A	A
Fuming sulfuric acid	H ₂ S ₂ O ₇	10	rt	A	A	A	C	A	A	C	C	C	C	B
		10	b	A	A	A	C	A	A	C	C	C	C	B
		25	rt	A	A	A	C	A	A	C	C	C	C	B
		25	b	B	B	B	C	A	A	C	C	C	C	B
Furfuryl alcohol	C ₅ H ₄ O ₂	25	b	A	A	A	A	A	C	C	C	A	A	A
		100	rt	A	A	A	A	A	C	C	C	A	A	A
		100	b	A	A	A	A	A	C	C	C	A	A	A
Glycerine	CH ₂ O HCHOH		rt	A	A	A	A	A	A	A	A	A	A	A
			b	A	A	A	A	A	A	A	A	A	A	A
Hydrochloric acid	HCl	0,5	rt	A	A	A	A	A	A	C	B	B	B	A
		0,5	b	A	A	A	A	A	B	C	C	C	C	B
		5	rt	A	A	A	A	A	A	C	B	B	B	A
		5	60	A	A	A	A	A	A	C	B	B	B	A
		5	b	A	A	A	A	A	B	C	C	C	C	B
		10	rt	A	A	A	A	A	A	C	B	B	B	A
		10	50	A	A	A	A	A	A	C	B	B	B	A
		10	b	A	A	A	A	A	B	C	C	C	C	B
		15	rt	A	A	A	A	A	A	C	B	B	B	A
		15	b	A	A	A	A	A	B	C	C	C	C	B
		20	rt	A	A	A	A	A	A	C	B	B	B	A

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
		20	b	A	A	A	A	A	B	C	C	C	C	B
		30	rt	A	A	A	A	A	A	C	B	B	B	A
		30	b	A	A	A	A	A	B	C	C	C	C	B
		37	rt	A	A	A	A	A	A	C	B	B	B	A
		37	b	A	A	A	A	A	B	C	C	C	C	B
Hydrochloric acid + Nitric acid	HCl:HNO ₃	3:1	rt	A	A	A	A	A	B	C	C	C	C	B
Hydrogen bromide	HBr		rt	A	A	A	A	A	A	C	B	C	A	A
Hydrogen bromide	HBr	0-50	b	A	A	A	A	A	A	C	B	C	A	A
Hydrogen cyanide	HCN		rt	A	A	A	A	A	A	B	B	B	B	A
Hydrogen flouride	HF	1	rt	A	C	A	A	A	A	C	B	B	B	A
		40	rt	A	C	A	A	A	A	C	B	B	B	A
		40	50	A	C	A	A	A	A	C	C	C	C	B
		50	rt	A	C	A	A	A	A	C	B	B	B	A
		100	rt	A	C	A	C	A	A	C	C	C	C	A
		100	b	A	C	B	C	A	A	C	C	C	C	B
Hydrogen sulfide	H ₂ S		rt	A	A	A	A	A	A	C	B	C	A	A
			100	A	A	A	A	A	A	C	C	C	A	A
Lactic acid	H ₆ C ₃ O ₃	1,5	rt	A	A	A	A	A	B	B	B	C	B	B
		1,5	b	A	A	A	A	A	B	B	B	C	B	B
		10	rt	A	A	A	A	A	B	B	B	C	B	B
		10	b	A	A	A	A	A	B	B	B	C	B	B
		conc.	b	A	A	A	A	A	B	B	B	C	B	B
Lead acetate	C ₄ H ₆ O ₄ Pb	all	rt	A	A	A	A	A	A	A	A	A	A	A
Magnesium chloride	MgCl ₂	10	rt	A	A	A	A	A	A	B	A	A	A	A
		20	b	A	A	A	A	A	A	B	A	A	A	A
		30	rt	A	A	A	A	A	A	B	A	A	A	A
		42	b	A	A	A	A	A	A	B	A	A	A	A
Magnesium sulfate	MgSO ₄	10	rt	A	A	A	A	A	A	B	A	A	A	A
		25		A	A	A	A	A	A	B	A	A	A	A
		50		A	A	A	A	A	A	B	A	A	A	A
		sat.		A	A	A	A	A	A	B	A	A	A	A
Maleic acid	C ₄ H ₄ O ₄	10	til 80	A	A	A	A	A	C	C	A	B	B	A
		10	b	A	A	A	A	A	C	C	A	B	B	A
		50	100	A	A	A	A	A	C	C	A	B	B	A
Malic acid	C ₄ H ₆ O ₅	til 50	rt	A	A	A	A	A	A	A	A	A	A	A
			b	A	A	A	A	A	A	A	A	A	A	A
Manganese chloride	MnCl ₂	5	100	A	A	A	A	A	A		A	A		
		20	100	A	A	A	A	A	A		A	A		
		50	100	A	A	A	A	A	A		A	A		
Manganese sulfate	MnSO ₄	all	rt	A	A	A	A	A	A		A	A		
Mercury	Hg		20	A	A	A	A	A	A	A	A	A	A	A
			50	A	A	A	A	A	A	A	A	A	A	A
			b	A	A	A	C							
Methanol	CH ₃ OH	all	rt	A	A	A	A	A	C	B	A	A	A	A

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
		all	b	A	A	A	A	A	C	B	A	A	A	A
Methylene chloride	CH ₂ Cl ₂		rt - b	A	A	A	A	A	B	C	C	C	C	C
Monochloro acetic	CH ₂ ClCO ₂ H	50	rt	A	A	A	A	A	C	C	C	C	B	B
		70	b	A	A	A	A	A	C	C	C	C	B	B
		100	rt	A	A	A	A	A	C	C	C	C	B	B
		100	b	A	A	A	A	A	C	C	C	C	B	B
Naphta	C ₁₀ H ₈		rt	A	A	A	A	A	B	C	C	C	C	C
Nickel chloride	NiCl ₂ • 6H ₂ O	10	60	A	A	A	A	A	A	A	A	A	A	A
		10	b	A	A	A	A	A	A	A	A	A	A	A
		20	rt	A	A	A	A	A	A	A	A	A	A	A
		30	b	A	A	A	A	A	A	A	A	A	A	A
		80	95	A	A	A	A	A	A	A	A	A	A	A
Nickel nitrate	Ni(NO ₃) ₂ • 6H ₂ O		rt	A	A	A	A	A	A	A	A	A	A	A
Nickel sulfate	NiSO ₄ • 7H ₂ O		80	A	A	A	A	A	A	A	A	A	A	A
Nitric acid	HNO ₃	7	rt	A	A	A	A	A	B	C	C	C	C	B
		7	b	A	A	A	B	A	B	C	C	C	C	B
		10	rt	A	A	A	A	A	B	C	C	C	C	B
		10	b	A	A	A	C	A	B	C	C	C	C	B
		25	rt	A	A	A	B	A	B	C	C	C	C	B
		25	b	A	A	A	C	A	B	C	C	C	C	B
		37	rt	A	A	A	C	A	B	C	C	C	C	B
		37	b	A	A	A	C	A	B	C	C	C	C	B
		50	rt	A	A	A	C	A	B	C	C	C	C	B
		50	b	A	A	A	C	A	B	C	C	C	C	B
		65	rt	A	A	A	C	A	B	C	C	C	C	B
		65	b	A	A	A	C	A	B	C	C	C	C	B
		70	100	A	A	A	C	A	B	C	C	C	C	B
	Fuming	100	rt				C	A	B	C	C	C	C	B
		100	50-70				C	A	B	C	C	C	C	B
		100	b				C	A	B	C	C	C	C	B
Nitrobenzene				A	A	A	A	A	A	A	A	A	A	A
Oxalic acid	H ₂ C ₂ O ₄	5	rt	A	A	A	A	A	A	A	A	B	A	A
		5	b	A	A	A	A	A	A	A	A	B	A	A
		10	rt	A	A	A	A	A	A	A	A	B	A	A
		10	b	A	A	A	A	A	A	A	A	B	A	A
		25	rt	A	A	A	A	A	A	A	A	B	A	A
		25	b	A	A	A	A	A	A	A	A	B	A	A
		50	rt	A	A	A	A	A	A	A	A	B	A	A
		50	b	A	A	A	A	A	A	A	A	B	A	A
		sat.	rt	A	A	A	A	A	A	A	A	B	A	A
		sat.	b	A	A	A	A	A	A	A	A	B	A	A
Ozone	O ₃	liquid		A	A	A	C	A	A	C	B	C	A	A
Perchloro ethylene	C ₂ Cl ₄		rt	A	A	A	A	A	B	C	C	C	C	C
			b	A	A	A	A	A	B	C	C	C	C	C
Phenol	C ₆ H ₅ OH	pure	rt	A	A	A	A	A	B	C	C	C	C	C

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon	
				F99.7 AL23	FZM FZM+	FZT									
Phosphorous acid	H ₃ PO ₄	1	b	A	A	A	A	A	B	C	C	C	C	C	
		1	rt	A	A	A	A	A	A	B	A	A	A	A	
		1	140	A	A	A	A	A	A	A	C	A	A	A	A
		10	rt	A	A	A	A	A	A	A	C	A	A	A	A
		10	b	A	A	A	A	A	A	A	C	A	A	A	A
		30	rt	A	A	A	A	A	A	A	B	A	A	A	A
		30	b	A	A	A	A	A	A	A	C	A	A	A	A
		45	rt	A	A	A	A	A	A	A	B	A	A	A	A
		45	b	A	A	A	A	A	A	A	C	A	A	A	A
		80	rt	A	A	A	A	A	A	A	B	A	A	A	A
		80	60	A	A	A	A	A	A	A	C	A	A	A	A
		80	b	B	B	B	A	A	A	A	C	A	A	A	A
		90	rt	A	A	A	A	A	A	A	B	A	A	A	A
		90	b	B	B	B	C	A	A	A	C	A	A	A	A
		conc.	rt	A	A	A	A	A	A	A	B	A	A	A	A
		conc.	b	C	C	C	C	A	A	A	C	A	A	A	A
Potassium chlorate	KClO ₃	10	rt	A	A	A	A	A	A	A	A	A	A	A	
		10	b	A	A	A	A	A	A	A	A	A	A	A	
		20	b	A	A	A	A	A	A	A	A	A	A	A	
		30	b	A	A	A	A	A	A	A	A	A	A	A	
		sat.	100	A	A	A	A	A	A	A	A	A	A	A	
Potassium cyanide	KCN	10	rt	A	A	A	A	A	B	C	A	B	A	A	
Potassium hydroxide	KOH	10	rt	A	A	A	A	A	C	B	A	A	A	A	
		10	b	A	A	A	A	A	C	B	A	A	A	A	
		20	rt	A	A	A	A	A	C	B	A	A	A	A	
		20	b	A	A	A	A	A	C	B	A	A	A	A	
		28	rt	A	A	A	A	A	C	B	A	A	A	A	
		28	b	A	A	A	A	A	C	B	A	A	A	A	
		40	til b	A	A	A	B	A	C	B	A	A	A	A	
		50	rt	A	A	A	A	A	C	B	A	A	A	A	
		50	b	B	A	B	C	A	C	B	A	A	A	A	
Potassium hypochlorite	KOCl	20g Cl/l	til 40	A	A	A	A	A	A	C	C	C			
		130g	rt	A	A	A	A	A	A	C	C	C			
		130g	150	A	A	A	C	A	A	C	C	C			
Potassium nitrate	KNO ₃	25	rt	A	A	A	A	A	A	A	A	A	A	A	
		25	b	A	A	A	A	A	A	A	A	A	A	A	
		40	rt	A	A	A	A	A	A	A	A	A	A	A	
		40	b	A	A	A	A	A	A	A	A	A	A	A	
		50	rt	A	A	A	A	A	A	A	A	A	A	A	
		50	b	A	A	A	A	A	A	A	A	A	A	A	
		sat.	rt	A	A	A	A	A	A	A	A	A	A	A	A
		sat.	b	A	A	A	A	A	A	A	A	A	A	A	A
Potassium perchlorate	KClO ₄	25	25	A	A	A	A	A			A	A			
		50	25	A	A	A	A	A			A	A			

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregna- ted	PTFE	Viton	Perbu- nan	Neo- pren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
Potassium permanganate	KMnO ₄	75	25	A	A	A	A	A			A	A		
		all	rt	A	A	A	A	A			A	A		
Potassium sulfate	K ₂ SO ₄	10	rt	A	A	A	A	A	A	A	A	A	A	A
		20	til 50	A	A	A	A	A	A	A	A	A	A	A
Prussiate of potash	KCN	10	rt	A	A	A	A	A	B	C	A	B	A	A
Pyridine	C ₅ H ₅ N	50	rt-60	A	A	A	A	A	C	C	C	C	C	B
		100	rt-60	A	A	A	A	A	C	C	C	C	C	B
Salt water			rt	A	A	A	A	A	A	A	A	A	A	A
Sodium bicarbonate	NaHCO ₃	10	til b	A	A	A	A	A	B	B	A	A	A	A
		20	40-b	A	A	A	A	A	B	B	A	A	A	A
Sodium bisulfate	NaHSO ₄	all	all	A	A	A	A	A	B	B	A	A	A	A
		10	rt	A	A	A	A	A			A	A		
		10	b	A	A	A	A	A			A	A		
		sat.	rt	A	A	A	A	A			A	A		
Sodium bisulfite	NaHSO ₃	50	rt	A	A	A	A	A			A	A		
				A	A	A	A	A			A	A	A	A
Sodium carbonate	Na ₂ CO ₃	10	b	A	A	A	C	A	C	B	A	A	A	A
		20	rt	A	A	A	A	A	C	B	A	A	A	A
		20	50-b	A	A	A	A	A	C	B	A	A	A	A
		50	rt	A	A	A	A	A	C	B	A	A	A	A
		50	b	A	A	A	A	A	C	B	A	A	A	A
Sodium chlorate	NaClO ₃	5	rt	A	A	A	A	A	A	A	A	A	A	A
		5	b	A	A	A	A	A	A	A	A	A	A	A
Sodium chloride	NaCl	3.5	rt	A	A	A	A	A	A	A	A	A	A	A
		3.5	b	A	A	A	A	A	A	A	A	A	A	A
Sodium chloride solution		techn.	rt	A	A	A	A	A	A	A	A	A	A	A
			b	A	A	A	A	A	A	A	A	A	A	A
Sodium chlorite	NaClO ₂	5	rt	A	A	A	C	A			C	C		
		5	b	A	A	A	C	A			C	C		
		10	rt	A	A	A	C	A			C	C		
Sodium hydroxide (Caustic soda)	NaOH	10	rt	A	A	A	A	A	C	B	A	A	A	A
		10	b	A	A	A	A	A	C	B	A	A	A	A
		20	rt	A	A	A	A	A	C	B	A	A	A	A
		20	b	A	A	A	C	A	C	B	A	A	A	A
		34	rt	A	A	A	C	A	C	B	A	A	A	A
		34	b	A	A	A	C	A	C	B	A	A	A	A
		50	rt	A	A	A	C	A	C	B	A	A	A	A
		50	b	B	A	B	C	A	C	B	A	A	A	A
60	b	B	A	B	C	A	C	B	A	A	A	A		
	70	b	C	B	C	C	A	C	B	A	A	A	A	

Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregna- ted	PTFE	Viton	Perbu- nan	Neopren	Neutral rubber	Butyl rubber	Hypalon		
				F99.7 AL23	FZM FZM+	FZT										
Sodium hypochlorite (Bleaching soda)	NaOCl	10g Cl/I	rt	A	A	A	A	A	A	C	C	C	C	A		
		10g Cl/I	50	A	A	A	A	A	A	C	C	C	C	A		
		20g Cl/I	rt	A	A	A	A	A	A	C	C	C	C	A		
		20g Cl/I	40	A	A	A	A	A	A	C	C	C	C	A		
		120g	rt	A	A	A	A	A	A	C	C	C	C	A		
Sodium nitrate	NaNO ₃		b	A	A	A	A	A	A	C	C	C	C	A		
			rt	A	A	A	A	A	A	A	A	A	A	A		
Sodium nitrite	NaNO ₂		70	A	A	A	A	A	A	A	A	A	A	A		
			100	A	A	A	A	A	A	A	A	A	A	A		
Sodium peroxide	Na ₂ O ₂	10	rt	A	A	A	A	A			A	A				
			b	A	A	A	C	A			A	A				
Sodium sulfate	Na ₂ SO ₄ • 10H ₂ O	sat.	rt	A	A	A	A	A	A	C	B	C	A	A		
		sat.	b	A	A	A	A	A	A	C	B	C	A	A		
Sodium sulfide	Na ₂ S • 9H ₂ O	25	rt	A	A	A	A	A	A	C	B	C	A	A		
			b	A	A	A	A	A	A	C	B	C	A	A		
			rt	A	A	A	A	A	A	A	C	B	C	A	A	
			b	A	A	A	A	A	A	A	C	B	C	A	A	
			sat.	rt	A	A	A	A	A	A	C	B	C	A	A	
Sodium sulfite	Na ₂ SO ₃ • 7H ₂ O	25	rt	A	A	A	A	A	A	C	B	C	A	A		
			b	A	A	A	A	A	A	C	B	C	A	A		
			rt	A	A	A	A	A	A	A	C	B	C	A	A	
			b	A	A	A	A	A	A	A	C	B	C	A	A	
Sodium thiol	Na ₂ S ₂ O ₃ • 5H ₂ O	25	rt	A	A	A	A	A	A	C	B	C	A	A		
			b	A	A	A	A	A	A	C	B	C	A	A		
Spinning bath	til 10% H ₂ SO ₄		70	A	A	A	A	A	A	C	A	B	A	A		
	over 10% H ₂ SO ₄		70	A	A	A	A	A	A	C	A	B	A	A		
Stearic acid	C ₁₇ H ₃₅ COOH	techn.	100	A	A	A	A	A	A	A	A	B	C	C	C	
			150	A	A	A	A	A	A	A	A	B	C	C	C	
			rt	A	A	A	A	A	A	A	A	B	C	C	C	
			b	A	A	A	A	A	A	A	A	B	C	C	C	
			100	135	A	A	A	A	A	A	A	A	B	C	C	C
			100	315	A	A	A	C								
Sulfur chloride	S ₂ Cl ₂		rt	A	A	A	A	A	C	C	C	C	C	C		
			b	A	A	A		A	C	C	C	C	C	C		
Sulfuric acid	H ₂ SO ₄	2	rt	A	A	A	A	A	A	A	A	A	A	A		
			b	A	A	A	A	A	A	C	A	B	A	A		
			rt	A	A	A	A	A	A	A	A	A	A	A	A	
			b	A	A	A	A	A	A	A	C	A	B	A	A	
			rt	A	A	A	A	A	A	A	C	C	C	B	A	
			b	A	A	A	A	A	A	A	C	C	C	C	B	
			rt	A	A	A	A	A	A	A	C	C	C	B	A	
			b	A	A	A	A	A	A	A	C	C	C	C	B	
			50	A	A	A	A	A	A	C	C	C	B	A		
			b	A	B	A	A	A	A	A	C	C	C	C	B	


Agent	Chemical formula	Conc. (%)	Temp. (°C)	Oxide ceramics			Graphite impregnated	PTFE	Viton	Perbunan	Neopren	Neutral rubber	Butyl rubber	Hypalon
				F99.7 AL23	FZM FZM+	FZT								
		60	rt	A	A	A	A	A	A	C	C	C	B	A
		60	b	A	B	A	A	A	A	C	C	C	C	B
		77	rt	A	A	A	A	A	A	C	C	C	B	B
		77	b	B	C	B	C	A	A	C	C	C	C	C
		80	rt	A	A	A	A	A	A	C	C	C	B	B
		80	b	B	C	B	C	A	A	C	C	C	C	C
		85	rt	A	A	A	A	A	A	C	C	C	B	B
		85	b	B	C	B	C	A	A	C	C	C	C	C
		90	rt	A	A	A	B	A	A	C	C	C	B	B
		90	b	B	C	B	C	A	A	C	C	C	C	C
		96	rt	A	A	A	B	A	A	C	C	C	B	B
		96	b	B	C	B	C	A	A	C	C	C	C	C
Sulfuric acid	H ₂ SO ₃	sat.	rt	A	A	A	A	A	A	B	B	B	B	A
Sulfuric acid + nitric acid	H ₂ SO ₄ :HNO ₃	10:90	35	A	A	A	C	A	B	C	C	C	C	B
		30:70	35	A	A	A	C	A	B	C	C	C	C	B
		50:50	35	A	A	A	C	A	B	C	C	C	C	B
		60:40	35	A	A	A	C	A	B	C	C	C	C	B
		70:30	35	A	A	A	C	A	B	C	C	C	C	B
		80:20	35	A	A	A	A	A	A	C	C	C	C	B
		90:10	35	A	A	A	A	A	A	C	C	C	C	B
		99:1	35	A	A	A	A	A	A	C	C	C	C	B
Tannic acid	C ₇₆ H ₅₂ O ₄₄	10	rt	A	A	A		A	A	C	B	B	B	A
		10	b	A	A	A		A	A	C	B	B	B	A
		50	50	A	A	A		A	A	C	B	B	B	A
		50	b	A	A	A		A	A	C	B	B	B	A
Tartaric acid	C ₄ H ₆ O ₆	all	rt	A	A	A	A	A	A	A	A	A	A	A
		all	b	A	A	A	A	A	A	A	A	A	A	A
Tin chloride	SnCl ₂ , SnCl ₄	all	rt	A	A	A	A	A	A	A	A	A	A	A
		all	150	A	A	A	A	A	A	A	A	A	A	A
Trichloro ethylene	CHCl=CCl ₂		rt	A	A	A	A	A	B	C	C	C	C	C
Uric acid	C ₅ H ₄ N ₄ O ₃		rt	A	A	A	A	A	A	A	A	A	A	A
Zinc chloride	ZnCl ₂	10	rt	A	A	A	A	A	A	B	A	B	A	A
		10	b	A	A	A	A	A	A	B	A	B	A	A
		20	rt	A	A	A	A	A	A	B	A	B	A	A
		20	b	A	A	A	A	A	A	B	A	B	A	A
		60	rt	A	A	A	A	A	A	B	A	B	A	A
		60	b	A	A	A	A	A	A	B	A	B	A	A
		100	b	A	A	A	C	A	A	B	A	B	A	A

ABOUT KYOCERA



The global Kyocera corporation - a strong partner.

- ▶ **Headquarters:** Kyoto, Japan
- ▶ **Foundation:** 1959
- ▶ **Employees:** over 83.000 worldwide
- ▶ **European headquarters:** Esslingen, Germany
- ▶ **European production sites:** Mannheim, Germany
Selb, Germany
(further subsidiaries in Europe)

 **KYOCERA** = **KYOTO CERAMICS**

KYOCERA – it all began with ceramics

KYOCERA Fineceramics Europe GmbH is part of KYOCERA Corporation, headquartered in Kyoto, Japan, one of the world's leading manufacturer of high-performance ceramic components for the technology industry. Today, the Kyocera Group offers over 200 different ceramic materials and state-of-the-art technologies and services tailored to the individual needs of each market

KYOCERA Fineceramics Europe GmbH has grown steadily in recent years – and is now a leading European supplier of customised solutions made of technical ceramics. Working in partnership, we develop and manufacture products that offer our customers added value in their respective markets and secure their technological lead in the long term. We are committed to this every day.

Throughout Europe, we are represented by two production and development sites in Mannheim and Selb, as well as six sales offices –

in Mannheim, Selb, Esslingen, Neuss, Rungis (France) and Frimley (United Kingdom).

Our hearts beat completely for ceramics. Our team provides comprehensive advice on the selection of ceramic materials, product design and project execution – from the development stage to prototyping.

We supply system components for high-tech applications in numerous industries. Our products are characterised by high quality, precision and durability.

Our business partners benefit from the fact that we think and work across divisions within the Kyocera Group. Because innovations and real milestones can only be achieved together – across industries and national borders.

This is what we believe.

About the KYOCERA Group

KYOCERA Corporation (Kyoto) is one of the world's leading manufacturers of high-performance ceramic components for the technology industry. Strategically important business areas of the Kyocera Group, which consists of around 300 subsidiaries, are information and communications technologies, products to improve the quality of life, and environmentally friendly products. The technology group is also one of the most experienced producers of smart energy systems worldwide.

The products marketed by the company in Europe include printers, digital copying systems, semiconductor-, fine ceramic-, automotive- and electronic components as well as printing devices and ceramic kitchen products.

Kyocera is represented in Germany by four independent companies:

- **KYOCERA Europe GmbH** (Esslingen and Neuss),
- **KYOCERA Fin ceramics Europe GmbH** (Mannheim, Selb, Esslingen and Neuss)
- **KYOCERA Automotive and Industrial Solutions GmbH** (Dietzenbach)
- **KYOCERA Document Solutions GmbH** (Meerbusch)

The company also takes an active interest in cultural affairs. The Kyoto Prize, a prominent international award, is presented each year by the Inamori Foundation – established by Kyocera founder Dr. Kazuo Inamori – to individuals worldwide who have contributed significantly to the scientific, cultural, and spiritual betterment of humankind.





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