

The background of the page is a composite image. On the left, there is a curved, light-colored surface with a series of raised, rounded rectangular features, resembling a turbine blade or a similar mechanical part. This surface is set against a bright green background that has a microscopic, porous texture. A large, solid red diagonal shape cuts across the bottom right portion of the image, creating a dynamic, modern look.

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+	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								
Ferric(III)-Chloride	FeCl ₃	all	b	A	A	A	A	A	A	B	A	B	A	A
		5	25	A	A	A	A	A	A	B	A	B	A	A
		10	65	A	A	A	A	A	A	B	A	B	A	A
		15	25	A	A	A	A	A	A	B	A	B	A	A
		45	25	A	A	A	A	A	A	B	A	B	A	A
		50	50	A	A	A	A	A	A	B	A	B	A	A
Ferric(III)-Sulfate	Fe(SO ₄) ₃	50	b	A	A	A	A	A	A	B	A	B	A	A
			rt	A	A	A	A	A	A	B	A	B	A	A
		til 30	til 65	A	A	A	A	A	A	B	A	B	A	A
Flourosilic acid	H ₂ SiF		rt	A	B	A	A	A			A	A		
Formaldehyde	CH ₂ O	30	30	A	C	A	A	A			A	A		
Formic acid	HCOOH	all	til b	A	A	A	A	A	A	B	A	A	A	A
		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	A	A	A	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	C	A	A	A	A
		10	rt	A	A	A	A	A	A	C	A	A	A	A
		10	b	A	A	A	A	A	A	C	A	A	A	A
		30	rt	A	A	A	A	A	A	B	A	A	A	A
		30	b	A	A	A	A	A	A	C	A	A	A	A
		45	rt	A	A	A	A	A	A	B	A	A	A	A
		45	b	A	A	A	A	A	A	C	A	A	A	A
		80	rt	A	A	A	A	A	A	B	A	A	A	A
		80	60	A	A	A	A	A	A	C	A	A	A	A
		80	b	B	B	B	A	A	A	C	A	A	A	A
		90	rt	A	A	A	A	A	A	B	A	A	A	A
		90	b	B	B	B	C	A	A	C	A	A	A	A
		conc.	rt	A	A	A	A	A	A	B	A	A	A	A
		conc.	b	C	C	C	C	A	A	C	A	A	A	A
		Potassium chloride	KCl	10	rt	A	A	A	A	A	A	A	A	A
10	b			A	A	A	A	A	A	A	A	A	A	
20	b			A	A	A	A	A	A	A	A	A	A	
30	b			A	A	A	A	A	A	A	A	A	A	
sat.	100			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	
		25	b	A	A	A	A	A	A	A	A	A	A	
		40	rt	A	A	A	A	A	A	A	A	A	A	
		40	b	A	A	A	A	A	A	A	A	A	A	
		50	rt	A	A	A	A	A	A	A	A	A	A	
		50	b	A	A	A	A	A	A	A	A	A	A	
		sat.	rt	A	A	A	A	A	A	A	A	A	A	
sat.	b	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	C	B	A	A	A	A
		5	b	A	A	A	A	A	C	B	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		
		10	b	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 impregnated	PTFE	Viton	Perbunan	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	
		120g	b	A	A	A	A	A	A	C	C	C	C	A	
Sodium nitrate	NaNO ₃		rt	A	A	A	A	A	A	A	A	A	A	A	
			100	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	
			50	rt	A	A	A	A	A	A	C	B	C	A	A
			50	b	A	A	A	A	A	A	C	B	C	A	A
			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 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	
			50	rt	A	A	A	A	A	A	C	B	C	A	A
			50	b	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 over 10% H ₂ SO ₄		70	A	A	A	A	A	A	C	A	B	A	A	
			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	B	C	C	C	
			150	A	A	A	A	A	A	A	B	C	C	C	
			rt	A	A	A	A	A	A	A	B	C	C	C	
			b	A	A	A	A	A	A	A	B	C	C	C	
			100	135	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	
			5	rt	A	A	A	A	A	A	A	A	A	A	A
			5	b	A	A	A	A	A	A	C	A	B	A	A
			10	rt	A	A	A	A	A	A	C	C	C	B	A
			10	b	A	A	A	A	A	A	C	C	C	C	B
			25	rt	A	A	A	A	A	A	C	C	C	B	A
			25	b	A	A	A	A	A	A	C	C	C	C	B
			50	rt	A	A	A	A	A	A	C	C	C	B	A
			50	b	A	B	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

KYOCERA FINECERAMICS SOLUTIONS GMBH

THIS IS US. INNOVATION IN CERAMICS.

ELEVATOR MESSAGE

"Our extensive experience in high-performance ceramics and our alliance with Kyocera as a leading global technology group grant us access to innovation and resources that allow us to realize ambitious projects and take the lead for the future. We share our knowledge, and bring it together to create something new that goes beyond our company, beyond different industries and countries. As a team. Together with our customers."

Armin Kayser, General Manager of KYOCERA Fineceramics Solutions GmbH

KYOCERA Fineceramics Solutions GmbH - Summary

Location:	Mannheim, metropolitan Rhein-Neckar region
Founding year:	2019 - Spin-off from FRIATEC GmbH
Employees:	approx. 300 incl. approx. 30 trainees and apprentices
Subsidiaries:	KYOCERA Fineceramics Nordics AB (sales office for Northern Europe)

We look back on a long tradition in the manufacturing of ceramic products: Founded in Mannheim in 1863 as a brickyard known as "Deutsche Steinzeug", and later as "Friedrichsfeld GmbH", from 1993, the ceramics department continued its successful development under the brand FRIATEC GmbH. Since September 2019 we have been part of Kyocera Group, a leading global ceramics and technology company.

Kyocera companies benefit from the group's cross-department way of thinking and working. Because innovation and real milestones can only be achieved together. This is what we believe.

We are a supplier of innovative solutions for numerous industries: system components for high-tech applications in electrical and sensor technology, mechanical engineering, analysis technology, medical and semiconductor technology, as well as laboratory technology.

We possess internationally recognized know-how in the field of high-performance ceramics, especially for ceramic-to-metal assemblies. Our products are characterized by high quality, precision, and durability. Our production and development location in Central Europe and our customized supply-chain solutions make us extremely agile and ensure maximum reliability for our customers.

We see ourselves as a partner in the development of high-performance ceramics solutions that provide added value for our customers and ensure their technological advantage in their respective markets. Our focus today is on where we want to be tomorrow – together. We develop sustainable solutions that meet the demands of the future, supported by an experienced team of 50 highly qualified and quality-oriented engineers, scientists, technology experts, and masters.

ELECTRICAL ENGINEERING



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02



03



04

HIGH TEMPERATURE TECHNOLOGY



05



06



07



08

MECHANICAL ENGINEERING



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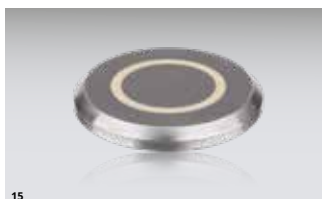
SENSOR AND MEASURING TECHNOLOGY



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01. UHV vacuum chamber
02. Special insulation tube for research institutes
03. Feedthroughs with ISO-KF flange
04. High-voltage feedthrough

05. Rectangular tubes
06. Multi-bore tubes
07. Crucibles, boats and annealing
08. Boxes

09. Forming tools used in body construction
10. Dosing unit used in the pharmaceutical and cosmetic industry
11. Containment shells for the pump industry
12. Grinding tools used in metal processing

13. Pressure sensor for aerospace
14. Flow meters
15. Humidity sensor
16. Oxygen sensor



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