

Guide to chemical resistance
Guida alla compatibilità chimica



Chemical compatibility / Compatibilità chimica

Guide to chemical resistance

At the moment, thermoplastic materials are widely used in pipe systems for domestic and industrial uses.

Thermoplastic materials have not only replaced traditional materials such as steel, cast iron, and copper in the transport of water, but have also replaced insulating materials and glass for the chemical industry. The cause of these different uses is due to the fact that for each use an appropriate thermoplastic material can be combined. This chapter provides a guide to the chemical compatibility of materials.

The information contained in this section was collected from tests performed by many international standardization organizations (ISO), and also by independent laboratories. The tests are based on the use of pure chemicals.

In the case of product mixtures, further tests should be performed to ascertain the effective resistance of the materials in given circumstances.

The chemical resistance section should be consulted as a simple guide. Changes in composition, concentration or operating conditions under which the chemical compounds can be used could alter the chemical resistance of the materials.

Guida alla resistenza chimica

Attualmente i materiali termoplastici vengono largamente utilizzati in sistemi di tubazioni per usi domestici e industriali. I materiali termoplastici non solo hanno sostituito i materiali tradizionali come l'acciaio, la ghisa e il rame nel trasporto dell'acqua, ma anche materiali coibentanti e vetro per l'industria chimica. La causa di questi differenti usi è dovuta al fatto che per ogni impiego è abbinabile un appropriato materiale termoplastico.

Questo capitolo fornisce una guida alla compatibilità chimica dei materiali. Le informazioni contenute in questa sezione sono state raccolte da test eseguiti da molte organizzazioni internazionali di standardizzazione (ISO) e anche da laboratori indipendenti. I test sono basati sull'uso di prodotti chimici puri. Nel caso di miscele di prodotti, dovrebbero essere eseguiti ulteriori test per accettare l'effettiva resistenza dei materiali in date circostanze.

La sezione della resistenza chimica dovrebbe essere consultata come semplice guida. Cambi di composizione, concentrazione o condizioni di esercizio ai quali i composti chimici possono essere usati potrebbero alterare la resistenza chimica dei materiali.

Marks / Legenda

✓	Little or No effect / <i>Effetto minimo o nessun effetto</i>
○	Slight effect / <i>Effetto lieve</i>
◎	Noticeable effect / <i>Effetto notevole</i>
✗	Severe effect / <i>Effetto severo</i>
Blank space <i>Spazio bianco</i>	Not confirmed or no actual result / <i>Risultato non confermato o nessun risultato</i>

Chemicals	Conc.	Formula	PVC-U			PP-H			ABS			EPDM			FKM							
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	
Acetaldehyde	sol.ac (40%)	CH3CHO	✗			✓	✓	✓	○	✗				✓	✓	✓	○	○	○	○	✗	
Acetaldehyde	tecn.p. (100%)	CH3CHO	✗			✓	✓	○		✗				✓	✓	○		✗	✗	✗	✗	
Acetic Acid	sol.ac (10%)	CH3COOH	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	○		○	○	○	✗	
Acetic Acid	sol.ac (10-50%)	CH3COOH	✓	✓	○	✓	✓	○	○	○				✓	✓	○		○	○	○	✗	
Acetic Acid	sol.ac (50-60%)	CH3COOH	✓	○	○	✓	✓	○	○	✗				✗	✗			✗	✗	✗		
Acetic Acid	glacial (100%)	CH3COOH	✗			✓	○	✗		✗				✗				✗			✗	
Acetone	sol.ac (10%)	CH3COCH3	✗			✓	✓	✓	○	○				✓	✓	✓	○	✗				
Acetone	tecn.p. (100%)	CH3COCH3	✗			✓	✓	○		○				✓	○			✗				
Acetonitrile		CH3CN	✗			○	✗			✗				○	✗			✗				
Acrylonitrile	tecn.p. (100%)	CH2=CH-CN	✗			✗				✓	○	✗		✓	✓	○	✗	○	✗			
Acetophenone	tecn.p. (nd%)	CH3COC6H5	✗			○	✗			✗				✓	○	✗		✗				
Adipic acid	sol.ac (sat%)	HOOC(CH2)4COOH	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	○	✓	✓	✓	
Allyl Alcohol	sol.ac (96%)	CH2=CH-CH2OH	✓			✓	✓	○		✓	○	✗						✓	✓	✓	○	
Aluminium chloride		AlCl3	✓	✓	○	✓	✓	✓	✓	○				✓	✓	✓	✓	✓	✓	✓	✓	
Aluminium sulfate	sol.ac (sat%)	Al2(SO4)3	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	○	✓	✓	✓	✓	
Ammonia	sol.ac (dil%)	NH3	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	○	○	✗	✗	
Ammonia	sol.ac (sat%)	NH3	✓	✓	○	✓	✓	✓	✓	○	✗			✓	✓	✓		○	○	✗	✗	
Ammonia gas	tecn.p. (100%)	NH3	✓	✓	✓	✓	✓	✓	○	○	✗			✓	✓	✓	○	✗				
Ammonium Acetate	sol.ac (100%)	NH4CH3CO2	✓	✓	✓	✓	✓	✓	✓	○	○	○	○	✓	✓	✓	✓	○	✓	✓	✓	
Ammonium Carbonate	sol.ac (100%)	(NH4)2CO3	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓	
Ammonium Chloride	sol.ac (sat%)	NH4Cl	✓	✓	○	✓	✓	✓	✓	○	○			✓	✓	✓	✓	✓	✓	✓	✓	
Ammonium Nitrate	sol.ac (sat%)	NH4NO3	✓	✓	○	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓	
Ammonium Phosphate		(NH4)3PO4	✓	✓	✓	✓	✓	✓	✓		○			✓	✓	✓	✓	✓	✓	✓	✓	
Ammonium Sulfate	sol.ac (tutte%)	(NH4)2SO4	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓	
Ammonium Sulfide	sol.ac (tutte%)	(NH4)2S	✓	✓	○	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✗	
Amyl Acetate	tecn.p. (100%)	CH3COO(CH2)4CH3	✗			○	✗			✗				○	✗			○	○	✗		
Amyl Alcohol		CH3(CH2)3CH2OH	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	✓	✓	✓	○	
Aniline	sol.ac (sat%)	C6H5NH	✗	✗		○	○	○	✗	✗	✗			✓	✗	✗		✓	○	○		
Antimony Trichloride	sol.ac (0-80%)	SbCl3	✓	✓	○	✓	✓	✓	○	○	✗			○				✓	✓	✓	○	
Aqua regia		3HCl+HNO3	✗	✗		✗	✗	✗	✗	✗	✗			✗		✗		✗				
Arsenic Acid	sol.ac (80%)	H3ASO4	✓	○	✗	✓	✓	✓	○	✗	○			✓	✓	○	○	✓	✓	✓	○	
Barium Carbonate	sol.ac (tutte%)	BaCO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓	✓
Barium Chloride	sol.ac (tutte%)	BaCl2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Barium Hydroxide	sol.ac (sat%)	Ba(OH)2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Barium Nitrate	sol.ac (sat%)	Ba(NO3)2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Barium Sulfate	sol.ac (sat%)	BaSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Barium Sulfide	sol.ac (sat%)	BaS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Beer			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓
Benzaldehyde	sol.ac (sat%)	C6H5CHO	✗			✓				✗				✗				✗				
Benzene	tecn.p. (100%)	C6H6	✗	✗		○	✗			✗				✗			✗		✓	○	○	
Benzene-Sulphonic Acid	sol.ac (10%)	C6H5SO3H	✓	✓	○	✓	✓	✓	○	✗	○	○		✗				✓	✓	✓	○	
Benzoic Acid	sol.ac (sat%)	C6H5COOH	✓	✓	○	✓	✓	✓	✓	✓	○			✓	○	○		✓	✓	✓	✓	
Benzyl Alcohol	tecn.p. (100%)	C6H5CH2OH	○	✗		✓	✓	✓	✓	✓	✗	✗		✓	○	✗		✓	✓	✓	✗	

Chemicals	Conc.	Formula	PVC-U				PP-H				ABS				EPDM				FKM						
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
Boric Acid	sol.ac (sat%)	H3B03	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓
Brine			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bromine water		Br2-H20	✓	○		∅	✗			✗				✗				✗				✓	✓		
Bromine	tecn.p. (100%)	Br2	✗			✗				✗				✗				✗				✓	✓	○	
Butadiene	gas (100%)	CH2=CH-CH=CH2	✓	✓	✓	○	✗			✗				✗				✗				✓	✓	✓	✓
Butylene Glycol	tecn.p. (100%)	CH2OH-CH=CH-CH2OH	✓	✓	○	✓	✓	○		○				✓	✓	○		✓	✓	○		✓	✓	○	
Butane		CH3CH2CH2CH3	✓	✓		✓	✓	✓	✓	○	○	○	✗	✗				✓	✓	✓		✓	✓	✓	✓
Butyl Acetate	tecn.p. (100%)	CH3COO-CH2CH2CH2CH3	∅	✗		∅	✗			✗				○	∅	✗		✗				✗			
Butyl Alcohol	tecn.p. (100%)	CH3(CH2)3OH	✓	✓	○	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓	○	✗
Butyric Acid	tecn.p. (100%)	CH3CH2CH2COOH	○			✓	✓	✓	✓	✓	✓	✓	✓	✗			○		○	○	○	○	○	✗	
Calcium Carbonate	sol.ac (tutte%)	CaCO3	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	○	✓	✓	✓	○	✓	✓	✓	✓
Calcium Chloride	sol.ac (tutte%)	CaCl2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✗	✓	✓	✓	✓	✓	✓	✓	✓
Calcium Hydroxide	sol.ac (tutte%)	Ca(OH)2	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Calcium Hypochlorite	sol.ac (sat%)	Ca(ClO)2	✓	✓	○	✓	✓	○	∅	✓	✓	○		○	○	○	∅	○	✓	✓	✓	✓	✓	○	
Calcium Nitrate	sol.ac (50%)	Ca(NO3)2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓
Calcium Sulfate	sol.ac (sat%)	CaSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓
Carbon Dioxide	gas (100%)	CO2	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Carbon Dioxide	sol.ac (nd%)	CO2+H20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓	✓
Carbon Disulfide	tecn.p. (100%)	CS2	∅	∅	✗	✗				✗				✗				✓	○	∅	✗	✓	○	∅	
Carbon Tetrachloride	tecn.p. (100%)	CCl4	∅	✗		✗				✗				✗				○				○			
Carbonic Acid (carbon dioxide)	sol.ac (sat%)	H2CO3	✓	✓	○	✓	✓	✓	✓	○				○				✓	✓	✓	✓	✓	✓	✓	✓
Chloric Acid	sol.ac (0-10%)	HClO3	✓	✓	○	○	✗			✗				✓	✓	○	○	✓	✓	○	○	✓	○	○	✗
Chloric Acid	sol.ac (>10-20%)	HClO3	✓	✓	○	○	✗			✗				✓	✓	○	✗	✓	✓	○	○	✓	○	○	✗
Chlorine gas (wet)		Cl2	✓	✓	○	✗				✗				✗				✗				✓	○	✗	
Chlorine water	sol.ac (sat%)	Cl2	✓	✓	○	∅	✗			✗				○		∅	∅	∅	∅	∅	∅	∅	✗		
Chlorine Dioxide	sol.ac (<1ppm)	ClO2	✓	✓	○	○				✗				✗				✗				✓	✓	○	
Chlorine Dioxide	tecn.p. (>1ppm-0.2%)	ClO2	○			✗				✗				✗				✗				✓	✓	○	
Chlorine Dioxide	tecn.p. (>2%)	ClO2	○			✗				✗				✗				✗				✓	✓	○	
Chloroacetic Acid	sol.ac (50%)	C1CH2COOH	✓	○	○	✓	✓	✓	○	✗				✓	✓	○	✗	✗							
Chloroacetic Acid	sol.ac (100%)	C1CH2COOH	○	○	✗	✓	✓	✓	○	✗	✗			○	○	✗		○	○	✗		✗			
Chlorobenzene	tecn.p. (100%)	C6H5Cl	✗			○	✗			✗				✗				✗				✓	✓	○	✗
Chlorosulphonic Acid	tecn.p. (100%)	HClSO3	○	✗		✗				✗				✗				✗				✗			
Chromic Acid	sol.ac (<10%)	CrO3+H20	○	○	✗	✗				✗				✗				✗				✓	✓	✓	○
Chromic Acid	sol.ac (10-30%)	CrO3+H20	○	○	✗	✗				✗				✗				✗				✓	✓	✓	○
Chromic Acid	sol.ac (>30%)	CrO3+H20	○	✗		✗				✗				✗				✗				✓	✓	○	○
Citric acid	sol.ac	COOH-CH2C(COOH)OH-CH2COOH	✓	✓	✓	✓	✓	✓	✓	✓				✗				✓	✓	✓	○	✓	✓	✓	✓
Copper Chloride	sol.ac (sat%)	CuCl2	✓	✓	✓	✓	✓	✓	✓	✓	○			○				✓	✓	✓	✓	✓	✓	✓	✓
Copper Fluoride	sol.ac (tutte%)	CuF2	✓	✓	○	✓	✓	✓	○	○				○				✓	✓			✓	✓		
Copper Nitrate	sol.ac (nd%)	Cu(NO3)2	✓	✓	○	✓	✓	✓	✓	○	○			○				✓	✓	✓	✓	✓	✓	✓	○
Copper Sulphate	sol.ac (sat%)	CuSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓			○				✓	✓	✓	✓	✓	✓	✓	○
Cresol	sol.ac (>90%)	CH3C6H4OH	∅			✓	○			○				○				✗				✓	✓	○	

Chemicals	Conc.	Formula	PVC-U			PP-H			ABS			EPDM			FKM			
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	
Crotonaldehyde	tecn.p. (100%)	CH3-CH=CH-CHO	✗			✓				✗			○			✓		
Cyclohexane	tecn.p. (100%)	C6H12	✗			∅	✗			✗			✗			✓	✓	
Cyclohexanol	tecn.p. (100%)	C6H11OH	✗			✓	○	∅	✗	✗			○			✓	✓	
Cyclohexanone	tecn.p. (100%)	C6H10O	✗			○	∅	✗		✗			∅			✗		
Dextrin	sol.ac		✓	✓	✓	✓	✓	✓	✓	○	○			✓	✓	✓	✓	✓
Dextrose	sol.ac (tutte%)	C6H12O6	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓
Dibutyl Ether	tecn.p. (100%)	[CH3(CH2)3]2O	✗			∅				✗			✗			✗		
Dibutyl Phthalate	tecn.p. (100%)	C6H4(COOCH2)2	✗			✓	○	✗		✗			○	○	○	✗	○	○
Dichloroacetic Acid	sol.ac (<50%)	Cl2CHCOOH	✓	✓	○	✓	✓	○	✗	✗			○	○	✗	○	○	✗
Dichloroacetic Acid	tecn.p. (100%)	Cl2CHCOOH	✓	○	✗	○	✗			✗			✗			○	✗	
Dichlorobenzene	tecn.p. (100%)	C6H4Cl2	✗			✗				✗			✗			○		
Dichloroethylene	tecn.p. (100%)	CHCl=CHCl	✗			✗				✗			✗			○		
Oil for diesel motor			○	○	✗	○	✗			✗			✗			✓	✓	○
Diethylamine	tecn.p. (100%)	(C2H5)2NH	✗			✓	○			✗			✓	○		✗		
Diethyl Ether	tecn.p. (100%)	C2H5OC2H5	✗			∅	✗			✗			∅			∅		
Diglycolic Acid	sol.ac (sat%)	HOOC-CH2-OCH2-COOH	✓	✓	○	✓	✓	✓					✓			✓		
Dimethylamine	tecn.p. (100%)	(CH3)2NH	✗			✓	○	✗		✗			∅			✗		
Diisobutyl Ketone	tecn.p. (100%)	(CH3)2CHCH2CO-CH2CH(CH3)	✗			✓	○	✗		✗			✓	✓	○	✗	✗	
Dimethylformamide	tecn.p. (100%)	HCON(CH3)2	✗			✓	✓	○		✗			✓			✓		
Dioxane	tecn.p. (100%)	(CH2)4O2	✗			○	∅			✗			✗			✗		
Ethyl Acetate	tecn.p. (100%)	CH3COOCH2CH3	✗			○	○	∅		✗			○			✗		
Ethyl Acrylate	tecn.p. (100%)	CH2=CHCOOCH2CH3	✗										○			✗		
Ethyl Alcohol	sol.ac (96%)	CH3CH2OH	✓	✓	○	✓	✓	○	○	✗			✓	✓	✓	✓	✓	✓
Ethyl Benzene	tecn.p. (100%)	C6H5C2H5	✗			○	✗			✗			✗			✓		
Ethyl Chloride	tecn.p. (100%)	CH3CH2Cl	✗			✗				✗			✓	✓		✓	✓	○
Ethylenediamine	tecn.p. (100%)	NH2CH2CH2NH2	✗			○				✗			✓			✗		
Ethylene Glycol	tecn.p. (<50%)	HOCH2-CH2OH	✓	✓	✓	✓	✓	✓	✓	✓	○	○	∅	✓	✓	✓	✓	○
Ethylene Glycol	tecn.p. (100%)	HOCH2-CH2OH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗		✓	✓	✓	✓	○
Ferric Chloride	sol.ac (sat%)	FeCl3	✓	✓	○	✓	✓	✓	✓	✓	✗			✓	✓	✓	✓	✓
Ferrous Chloride	sol.ac (sat%)	FeCl2	✓	✓	○	✓	✓	✓	✓	✓	✗			✓	✓	✓	✓	✓
Ferric Hydroxide	tecn.p. (sat%)	Fe(OH)3	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
Ferrous Hydroxide	tecn.p. (sat%)	Fe(OH)2	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
Ferric Nitrate		Fe(NO3)3	✓	✓	✓	✓	✓	✓	✓		✓	○	✗		✓	✓	✓	✓
Ferrous Nitrate		Fe(NO3)2	✓	✓	✓	✓	✓	✓	✓		✓	○	✗		✓	✓	✓	✓
Ferrous Sulfate	sol.ac (sat%)	FeSO4	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	○	✓	✓	✓	✓
Ferric Sulfate	sol.ac (sat%)	Fe(SO4)3	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	○	✓	✓	✓	✓
Fluoroboric Acid	tecn.p. (100%)	HBF4	✓	✓	○	✓	✓	✓	✓	○				✓	✓	✓	✓	✓
Fluorosilicic Acid	sol.ac (32%)	H2SiF6	✓	✓	✓	✓	✓	✓	✓	✓	○	✗		✓	✓	✓	○	✓
Formamide	tecn.p. (100%)	HCONH2	✗			✓	✓	✓	✓	○	✗			✓	○	✗	○	✗
Formic Acid	sol.ac (25-50%)	HCOOH	✓	○	○	✓	○	○	✗	✗				✓	✓	✓	○	○
Formic Acid	sol.ac (60-85%)	HCOOH	✓	○		✓	○	○	✗	✗				✓	✓	✓	✗	✗
Formic Acid	sol.ac (>85%)	HCOOH	✓	○		✓	○	○	✗	✗				✓	✓	✓	✗	✗
Fuel oil			✗			○	✗			✗			✗			✓	✓	○
Polpe and fruite juice			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓	✓

Chemicals	Conc.	Formula	PVC-U			PP-H			ABS			EPDM			FKM						
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
Furfuryl Alcohol	tecn.p. (100%)	C5H6O2	✗			✓	✓	○	✗	✗				✗				✗			
Gasoline			○	○		✗	✗			✗				○				○			✗
Glucose	sol.ac (tutte%)	C6H12O6	✓	✓	○	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	✓	✓	✓	✓
Glycerol, Glycerin		HOCH2-CH(OH)-CH2OH	✓	✓	✓	✓	✓	✓	✓	✓	✓	○		✓	✓	✓	✓	✓	✓	✓	✓
Heptane		C7H16	✓	✓	○	✓	○	✗		○					✗				✓	✓	✓
Hexane		C7H16	✓	○		✓	○	✗		○					✗				✓		
Hydrazine	sol.ac	H2N-NH2xH2O	✓	○	✗	✓	○	✗		✗				✓	○	○	✗	✗	✗		
Hydrobromic Acid	sol.ac (<47%)	HBr	✓	✓	○	✓	✓	✓	○	✓	✓	○		✓	✓			✓	✓		
Hydrochloric Acid	sol.ac (<10%)	HCl	✓	✓	○	✓	✓	✓	○	○	○	○		✓	✓	✓	✓	✓	✓	✓	✓
Hydrochloric Acid	sol.ac (10-25%)	HCl	✓	✓	○	✓	✓	✓	✓	○	○	✗		✓	✓	✓	✓	✓	✓	✓	✓
Hydrochloric Acid	sol.ac (25-30%)	HCl	✓	✓	○	✓	✓	✓	○	○	✗			✓	✓	○		✓	○		
Hydrochloric Acid	sol.ac (30-37%)	HCl	✓	✓	○	✓	✓	✓	○	○	✗			✓	○			○	✗	✗	
Hydrochloric Acid	sol.ac (>37%)	HCl	✓	✓	○	✓	✓	✓	○	✗				✗				○	✗	✗	
Hydrofluoric Acid	sol.ac (<10%)	HF	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗		✓	✓	✓	✓	✓	✓	✓	✓
Hydrofluoric Acid	sol.ac (30%)	HF	✓	○	✗	✓	✓	✓	✓	○	✗			✓	✓	✓	○	✓	✓	✓	○
Hydrofluoric Acid	sol.ac (40%)	HF	○	✗	✗	✓	✓	✓	✓	○	✗			✓	✓	✓	○	✓	✓	○	○
Hydrofluoric Acid	sol.ac (55%)	HF	○	✗	✗	✓	✓	✓	○	○	✗			✓	✓	✓	○	✓	○	✗	✗
Hydrogen		H2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓
Hydrogen Peroxide	sol.ac (20%)	H2O2	✓	✓	○	✓	✓	✓	✓	○	✗			✓	○	○	○	✓	✓	✓	✓
Hydrogen Peroxide	sol.ac (35%)	H2O2	✓	○	✗	✓	○	○	○	✗				○	○	✗		✓	✓	✓	✗
Hydrogen Peroxide	sol.ac (50%)	H2O2	○	✗		✗	✗			✗				✗				✗			✗
Isopropyl Alcohol	tecn.p. (100%)	(CH3)2CHOH	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓		✓	✓	✓	✓
Isopropyl Ether	tecn.p. (100%)	(CH3)2CHOCH(CH3)2	✗	✗	✗	○	✗	✗	✗	✗				✗				✗			
Lactic acid			✓	✓	✓	✓	✓	✓	✓	○	○	○		✓	✓	✓	✓	✓	✓	✓	✓
Linseed oil	sol.ac	CH3CHOHCOOH	✓	✓	○	✓	✓	✓	✓	○	○			○				✓		✓	✓
Magnesium Carbonate	sol.ac (tutte%)	MgCO3	✓	✓	○	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Magnesium Chlorite	sol.ac (tutte%)	MgCO3	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Magnesium Hydroxide	sol.ac (tutte%)	Mg(OH)2	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Magnesium Nitrate	sol.ac (nd%)	Mg(NO3)2	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Magnesium Sulfate		MgSO4	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Maleic Acid	sol.ac (sat%)	HOOC-CH=CH-COOH	✓	✓	○	✓	✓	✓	✓	✓	○			✓	○	○		✓	✓	○	○
Mercuric Chloride	sol.ac (sat%)	HgCl2	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓		✓	✓	✓	✓
Mercuric Cyanide	sol.ac (tutte%)	Hg(CN)2	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓		✓			
Mercuric Nitrate	sol.ac (sat%)	Hg(NO3)2	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓		✓	✓	✓	✓
Mercuric Sulphate	sol.ac (sat%)	HgSO4	✓	✓	✓	✓	✓	✓	✓	✓	○			✓	✓	✓		✓	✓	✓	✓
Mercurous Nitrate	sol.ac (sat%)	HgNO3	✓	✓	✓	✓	✓				○			✓							
Mercury	tecn.p. (100%)	Hg	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
Methane		CH4	✓	✓	○	✓	✓	✓	○	○	○			✓	✓	✓	✓	○	✓	✓	✓
Methyl Acetate	tecn.p. (100%)	CH3COOCH3	✗			○				✗				○	✗			✗			
Methyl Alcohol (Methanol)	tecn.p. (100%)	CH3OH	✓	○	○	✓	✓	✓	○	✗				✓	✓	✓		○	○	○	✗
Methyl Ethyl Ketone		CH3COCH2CH3	✗			✓	✗	✗	✗	✗				○	✗			✗			
Methyl Isobutyl Ketone		CH3COCH2CH(CH3)2	✗			✓	○			✗				✓	○			✗			

Chemicals	Conc.	Formula	PVC-U			PP-H			ABS			EPDM			FKM						
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
Methyl methacrylate		C5H8O2	✗			✓	✓	○		✗			✗					✗			
Milk			✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	○	✓	✓	✓	✓
Naphthalene	tecn.p. (100%)	C10H8	✗			○				✗			✗					✓	✓	✓	✓
Natural gas			✓	✓	○	✓	○						✓					✓			
Nickel Acetate		(CH3COO)2Ni	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓				⊗			
Nickel Chloride	sol.ac (tutte%)	NiCl2	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓
Nickel Nitrate	sol.ac (sat%)	Ni(NO3)2	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓
Nickel Sulfate	sol.ac (sat%)	NiSO4	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	✓	✓	✓	✓	✓
Nitric Acid	sol.ac (30%)	HNO3	✓	✓	○	✓	✓	○	○	○	✗			○	○	✗		✓	✓	⊗	✗
Nitric Acid	sol.ac (70%)	HNO3	✓	○	⊗	⊗	✗			✗				○				⊗	✗		
Nitrobenzene		C6H5NO2	✗			✓	○	⊗		✗			○					○			
Nitrotoluene	tecn.p. (100%)	CH3C6H4NO2	✗			○				✗			✗					○			
Nitrous Acid	sol.ac (10%)	HNO2	✓	✓	○	✓	○			✗			✓	○				✓	✓	○	
Oleic Acid	tecn.p. (100%)	C17H33COOH	✓	✓	✓	✓	✓	✓	✓	✓	✗			✗				✓	✓	✓	✓
Olive oil			✓	✓	○	✓	✓	✓	✓	✓	✗			○				✓	✓	✓	✓
Palmitic Acid		CH3(CH2)14COOH	✓			✓	✓	✓	○	✗				○				✓			
Emulsion of parafin	emu.ac		○			✓	✓	✓	○	✓	✓	○	✗					✓	✓	✓	✓
Paraffin oil	emu.ac		✓	✓		✓	✓			✓	✓	○	✗					✓	✓	✓	✓
Petroleum	tecn.p. (100%)		○			○				✗			✗					✓			
Phenol	sol.ac (<10%)	C6H5OH	✓	○		✓	✓	○	✗	✗				✓				✓			
Phenylhydrazine	tecn.p. (100%)	C6H5NHNH2	✗			⊗							○					○		✗	
Phenylhydrazine hydrochloride	sol.ac (sat%)	C6H5NHNH2HCl	✗			✓											✓	✓		✓	✓
Phosgene gas	tecn.p. (100%)	COCl2	✗			✗				✗									✗		
Phosphoric Acid	sol.ac (10%)	H3PO4	✓	✓	✓	✓	✓	✓	○	✓	○			✓	✓	✓	✓	✓	✓	✓	✓
Phosphoric Acid	sol.ac (50%)	H3PO4	✓	✓	✓	✓	✓	✓	✓	⊗	✗			✓	✓	✓	✓	✓	✓	✓	✓
Phosphoric Acid	sol.ac (85%)	H3PO4	✓	✓	○	✓	✓	○		✗				✓	✓	✓	✓	✓	✓	✓	✓
Phthalic Acid	sol.ac (sat%)	C6H4(COOH)2	✓			✓				✗				✓				✓			
Picric Acid	sol.ac (1%)	C6H2(OH)(NO2)3	✓	✓	✓	✓	✓	✓	✓	✓	✗			✓	✓	✓	○	✓	✓	✓	○
Potassium Dichromate	sol.ac (sat%)	K2Cr2O7	✓	✓	✓	✓	✓	✓	✓	○								✓	✓	✓	✓
Potassium Chromate	sol.ac (sat%)	K2CrO4	✓	✓	○	✓	✓	✓	✓	○								✓	✓	✓	✓
Potassium Cyanide	sol.ac (sat%)	KCN	✓	✓	✓	✓	✓	✓	✓	○	○							✓	✓	✓	✓
Potassium Iodide	sol.ac (sat%)	KI	✓	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓	✓	✓
Potassium Nitrate	sol.ac (sat%)	KNO3	✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	✓
Potassium Sulfate	sol.ac (sat%)	K2SO4	✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	○
Propane liquid		CH3CH2CH3	✓			✓				✓			✗					✓			
Propane gas		CH3CH2CH3	✓	○		✓	○			○	○		○					✓	✓	✓	✓
Propionic Acid	sol.ac (50%)	CH3CH2COOH	✓	○		✓	○			✗				✓	✓	✓	○	✗			
Propyl Alcohol	sol.ac (97%)	C3H7OH	✓	✓	○	✓	✓	✓	○					✓	✓	✓	✓	✓	✓	✓	✓
Pyridine	tecn.p. (100%)	C5H5N	✗			✓	✓	○		✗				○	⊗	✗		✗			
Silicon oil			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	✓	✓
Silver Cyanide	sol.ac (tutte%)	AgCN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○				✓	✓	✓	✓	✓
Silver Nitrate	sol.ac (sat%)	AgNO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	✓	✓
Sodium Acetate	sol.ac (sat%)	CH3COONa	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓	✓	✓	✓

Chemicals	Conc.	Formula	PVC-U			PP-H				ABS				EPDM				FKM			
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
Sodium Benzoate		C6H5COONa	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	○	✓	✓	○	
Sodium Hydrogen Carbonate	sol.ac (10%)	NaHCO3	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	✓	✓	✓	✓	✓
Sodium Hydrogen Sulfate	sol.ac (10%)	NaHSO4	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	✓	✓	✓	✓	✓
Sodium Bromate	sol.ac (tutte%)	NaBrO3	✓	○		✓	○			✓	✓	✓	○	✓	✓	✓		✓	✓	✓	
Sodium Bromide	sol.ac (sat%)	NaBr	✓	✓	✓	✓	✓	✓		✓	✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓
Sodium Carbonate	sol.ac (sat%)	Na2CO3	✓	✓	✓	✓	✓	✓	✓	○	○	○	✗	✓	✓	✓	✓	✓	✓	✓	✓
Sodium Chloride	sol.ac (dil%)	NaCl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓
Sodium Chloride	sol.ac (sat%)	NaCl	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Sodium Chlorite	sol.ac (25%)	NaClO2	✗		✗								○				○				
Sodium Hydrogen Sulfite	sol.ac (100%)	NaHSO3	✓	✓	✗	✓	✓	✓		✗				✓	✓	✓	✓	✓	✓	✓	✓
Sodium Fluoride	sol.ac (sat%)	NaF	✓	✓	✓	✓	✓	✓						✓	✓	✓		✓	✓	✓	
Sodium hydroxide	sol.ac (5%)	NaOH	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	✓	○	○	✗	
Sodium hydroxide	sol.ac (15%)	NaOH	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓	✓	○	○	✗	
Sodium hydroxide	sol.ac (30%)	NaOH	✓	✓	✓	✓	✓	✓	✓	✓	✗			✓	✓	✓	✓	○	○	✗	
Sodium hydroxide	sol.ac (50%)	NaOH	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	✓	✓	✓	✗
Sodium hypochlorite	sol.ac (3%)	NaClO	✓	✓	○	○	○	○		✗				○	○	○		✓	✓	○	
Sodium hypochlorite	sol.ac (5%)	NaClO	✓	✓	○	○	○	○	○	✗				○	○	○		✓	✓	○	○
Sodium hypochlorite	sol.ac (7%)	NaClO	✓	✓	○	○	○	○	○	✗				○	○	○		✓	✓	○	○
Sodium hypochlorite	sol.ac (10%)	NaClO	✓	✓	○	○	○	○	○	✗				✗				✓	✓	○	○
Sodium hypochlorite	sol.ac (13%)	NaClO	✓	✓	○	○	○	○	○	✗				✗				✓	✓	○	○
Sodium Persulfate	sol.ac (sat%)	Na2S2O8	✓	○	✗	○	✗							✓	✓	○	✗	✓	✓	○	✗
Sodium Nitrate	sol.ac (sat%)	NaNO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Sodium Nitrite	sol.ac (sat%)	NaNO2	✓	✓	○	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sodium Phosphate	sol.ac (sat%)	Na3P04	✓	✓	○	✓	✓	✓	✓		✓	✗		✓	✓	✓		✓	✓	✓	
Sodium Sulfate	sol.ac (sat%)	Na2SO4	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sodium Sulfide	sol.ac (sat%)	Na2S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	○	✓	✓	✓	✓
Sodium Sulfite	sol.ac (sat%)	Na2SO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	○
Sodium Thiosulfate	sol.ac (sat%)	Na2S2O3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗				✓	✓	✓		✓
Stearic Acid	tecn.p. (100%)	C17H35COOH	✓	✓	○	✓	○	○		✓	✓			○				✓	✓	○	○
Sulfur Dioxide dry	tecn.p. (100%)	SO2	✓	✓	✓	✓	✓	✓	✓	✓	✗			✓	✓	✓	✓	○	✓	✓	
Sulfur Dioxide liquid	tecn.p. (100%)	SO2	✓	✓	○	✓	✓	✓	✓	○	✗			✓	✓	✓		✓	✓	✓	✓
Sulfuric Acid	sol.ac (10%)	H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗		✓	✓	✓	✓	✓	✓	✓
Sulfuric Acid	sol.ac (50%)	H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗		✓	✓	✓	○	✓	✓
Sulfuric Acid	sol.ac (70%)	H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	○	○	✓	✓	✓
Sulfuric Acid	sol.ac (80%)	H2SO4	✓	✓	○	✓	✓	✓	○	○	✗			✓	✓	✓	○	✓	✓	✓	○
Sulfuric Acid	sol.ac (98%)	H2SO4	○	○	✗	✗				✗				✗				✗			
Sulfurous Acid	sol.ac (sat%)	H2S03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	○	○	✓
Tannic Acid	sol.ac (tutte%)	C14H10O9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗		✓				○		
Tartaric Acid	sol.ac (<10%)	COOH(CH0H)2COOH	✓	✓	✓	✓	✓	✓	✓	○	✗			✓	✓	✓	✓	✓	✓	✓	○
Tetrachloroethane		CHCl2CHCl2	✗			○				✗				✗				✓			
Tetrachloroethylene		Cl2C=CCl2	○	○	✗	○	✗							○	✗			✓	✓	✓	○
Tetrahydrofurane		C4H8O	✗			○	○	○	✗	✗				○			○		✗		

Chemicals	Conc.	Formula	PVC-U			PP-H			ABS			EPDM			FKM						
Temperature (°C)			20	40	60	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80
Toluene	tecn.p. (100%)	C6H5CH3	✗			✓	∅	✗		✗			✗				✓				
Tributyl Phosphate	tecn.p. (100%)	(C4H9)3PO4	✗			✓	∅	∅		✗			∅				✗				
Trichloroacetic Acid	sol.ac	CCl3COOH	∅			✓	✓	∅		✗			✗				✗				
Trichloroethylen	tecn.p. (100%)	ClCH=CCl2	✗			∅	∅	✗		✗			✓	✓	✓	✓	✗				
Triethanolamine	tecn.p. (100%)	N(CH2CH2OH)3											∅				✗				
Turpentine	tecn.p. (100%)			✓	✓	✓	∅	∅	✗				∅				✓	✓	✓	✓	
Urea	sol.ac	NH2CONH2	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	
Urine			✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	
Wine vinegar	tecn.p. (comm%)		✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	
Potable water		H2O	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Xylene		C6H4(CH3)2	✗			✗				✗			✗				∅				
Zinc Chloride	sol.ac (dil%)	ZnCl2	✓	✓	✓	✓	✓	✓	✓	✓	∅		✓	✓	✓	✓	✓	✓	✓	✓	
Zinc Chloride	sol.ac (sat%)	ZnCl2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Zinc Nitrate	sol.ac (nd%)	Zn(NO3)2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Zinc Sulfate	sol.ac (dil%)	ZnSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Zinc Sulfate	sol.ac (sat%)	ZnSO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

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