

**PENETRON SYSTEMS
CHEMICAL RESISTANCE/CORROSION CHART**

Symbols: N/E = No Effect S/E = Slight Effect E = Effected

Chemical	Effect on Concrete	Concrete Treated with Penetron
Acetic Acid to 30%	Disintegrates Slowly	S/E
Acetone	Liquid loss by penetration	N/E
Acid Waters	Disintegrates Slowly. In porous or cracked concrete, attacks steel.	N/E
Almond Oil	Disintegrates Slowly	N/E
Alum	See Potassium Aluminum Sulfate	N/E
Aluminum Sulfate less than 5%	Disintegrates. In porous or cracked concrete, attacks steel.	N/E
Aluminum Sulfate more than 5%	Disintegrates. In porous or cracked concrete, attacks steel.	S/E
Ammonia, Liquid	Harmful only if it contains ammonium salts (See Below)	N/E
Ammonia, Vapors	May disintegrate moist concrete slowly or attack steel in porous or cracked moist concrete.	N/E
Ammonium Bisulfate	Disintegrates. In porous or cracked concrete, attacks steel.	N/E
Ammonium Chloride	Disintegrates Slowly. In porous or cracked concrete, attacks steel.	N/E
Ammonium Cyanide	Disintegrates Slowly	N/E

Ammonium Fluoride	Disintegrates Slowly	N/E
Ammonium Hydroxide	Not harmful	N/E
Ammonium Nitrate	Disintegrates. In porous or cracked concrete, attacks steel.	S/E
Ammonium Sulfate	Disintegrates. In porous or cracked concrete, attacks steel.	S/E
Ammonium Sulfide	Disintegrates	S/E
Ammonium Sulfite	Disintegrates	S/E
Ammonium Super-Phosphate	Disintegrates. In porous or cracked concrete, attacks steel.	S/E
Ammonium Thiosulfate	Disintegrates	S/E
Ashes	Harmful if wet, when sulfides and sulfates leach out (see Sodium Sulfate)	N/E
Automobile and diesel gases	May disintegrate moist concrete by action of carbonic, nitric, or sulfurous acid.	N/E
Benzol (Benzene)	Liquid loss by penetration	N/E
Bleaching Solution	See specific chemical, such as Hypochlorous Acid, Sodium Hypochlorite, Sulfurous Acid, etc.	-
Boric Acid	Negligible Effect	N/E
Brine	Deteriorates	N/E
Bromine	Gaseous bromine disintegrates Liquid bromine disintegrates if it contains	N/E

	hydrobromic acid and moisture	
Butyl Stearate	Disintegrates Slowly	N/E
Calcium Chloride	In porous or cracked concrete, attacks steel. Steel corrosion may cause concrete to spall	N/E
Calcium Hydroxide	Not harmful	N/E
Calcium Nitrate	Not harmful	N/E
Calcium Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Carbazole	Not harmful	N/E
Carbon Tetrachloride	Liquid loss by seepage	N/E
Caster Oil	Disintegrates, especially when open to air	N/E
Chlorine Gas	Slowly disintegrates moist concrete	N/E
Chrome Plating Solutions	Disintegrates Slowly	N/E
Chromic Acid 5% to 60%	Attacks steel in porous or cracked concrete	N/E
Cinders	Harmful if wet, when sulfides and sulfates leach out (see Sodium Sulfate)	N/E
Coal	Sulfides leaching from damp coal may oxidize to sulfuric or sulfurous acid, or ferrous sulfate	N/E
Cobalt Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E

Copper Chloride	Disintegrates Slowly	N/E
Copper Plating Solutions	Not harmful	N/E
Copper Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Copper Sulfide	Harmful if it contains Copper Sulfate	N/E
Creosol	If Phenol present, disintegrates slowly	N/E
Deicing Salts	Harmful	N/E
Ethyl Alcohol	Liquid loss by penetration	N/E
Ethyl Ether	Liquid loss by penetration	N/E
Ethylene Glycol	Disintegrates Slowly	N/E
Ferric Sulfate	Disintegrates concrete	N/E
Ferrous Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Flue Gases	Hot gases (400 to 100 degrees F) cause thermal stresses. Cooled, condensed sulfurous, hydrochloric acids disintegrate slowly	N/E
Formaldehyde 37%	Formic acid, formed in solution, disintegrates slowly	S/E
Formalin	See Formaldehyde	-
Formic Acid 10% - 90%	Disintegrates Slowly	S/E
Fruit Juices	Hydrofluoric, other acids and sugar cause disintegration	N/E

Gas Water	Ammonium salts seldom present in sufficient quantity to disintegrate	N/E
Gasoline	Liquid loss by penetration	N/E
Glucose	Disintegrates Slowly	N/E
Glycerine	Disintegrates Slowly	N/E
Humic Acid	Disintegrates Slowly	N/E
Hydrochloric Acid 10%	Disintegrates rapidly, including steel	N/E
Hydrochloric Acid 30%	Disintegrates rapidly, including steel	S/E
Hydrofluoric Acid 10%	Disintegrates rapidly, including steel	S/E
Hydrofluoric Acid 75%	Disintegrates rapidly	E
Hydrogen Sulfide	Not harmful, but in moist, oxidizing environments converts to sulfurous acid (see text) disintegrates slowly	S/E (very slowly)
Hypochlorous Acid 10%	Disintegrates Slowly	N/E
Iodine	Disintegrates Slowly	N/E
Kerosene	Liquid loss by penetration of concrete	N/E
Lactic Acid 25%	Disintegrates Slowly	N/E
Lamb Fat	Solid fat disintegration slowly, melted fat more rapidly	N/E
Lard and Lard Oil	Lard disintegrates slowly, lard oil more rapidly	N/E

Lignite Oils	If fatty oils ar present, disintegrates slowly	N/E
Lubricating Oils	If fatty oils ar present, disintegrates slowly	N/E
Machine Oil	If fatty oils ar present, disintegrates slowly	N/E
Magnesium Chloride	Disintegrates Slowly. In porous or cracked concrete, attacks steel.	N/E
Magnesium Nitrate	Disintegrates Slowly	N/E
Magnesium Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Mercuric Chloride	Disintegrates Slowly	N/E
Mercurous Chloride	Disintegrates Slowly	N/E
Methyl Ethyl Ketone	Liquid loss by penetration	N/E
Methyl Alcohol	Liquid loss by penetration	N/E
Mine Water, Waste	Sulfides, sulfates, or acids present disintegrate concrete and attack steel in porous or cracked concrete	N/E
Muriatic Acid	See Hydrochloric Acid	-
Nickel Plating Solutions	Nickel Ammonium Sulfate disintegrates slowly	N/E
Nickel Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Nitric Acid 2%-40%	Disintegrates rapidly	E
Olive Oil	Disintegrates Slowly	N/E

Petroleum Oils more than 35 degrees Below	Liquid loss by penetration	N/E
Phenol	Disintegrates Slowly	N/E
Phosphoric Acid 10%	Disintegrates Slowly	N/E
Phosphoric Acid 85%	Disintegrates Slowly	S/E
Pickling Brine	Attacks steel in porous or cracked concrete	N/E
Pitch	Not harmful	N/E
Potassium Aluminum Sulfate	Disintegrates concrete of inadequate sulfate resistance	N/E
Potassium Carbonate	Harmless unless Potassium Sulfate present	N/E
Potassium Chloride	Magnesium chloride, if present attacks steel in porous or cracked concrete	N/E
Potassium Cyanide	Disintegrates Slowly	N/E
Potassium Dichromate	Disintegrates	S/E
Potassium Hydroxide, 15%	Not harmful	N/E
Potassium Hydroxide, 25%	Disintegrates concrete	S/E
Potassium Hydroxide, 95%	Disintegrates concrete	S/E
Potassium Permanganate	Harmless unless Potassium Sulfate present	N/E

Sea Water	Disintegrates concrete of inadequate sulfate resistance, attacks steel in porous or cracked concrete	N/E
Sewage	Usually not harmful (See Hydrogen Sulfide)	N/E
Silage	Acetic, Butyric, Lactic Acids (and sometimes fermenting agent of hydrochloric or sulfuric acids) disintegrate fast	N/E
Slaughterhouse Wastes	Organic acids disintegrate	N/E
Sodium Bicarbonate	Not harmful	N/E
Sodium Bisulfate	Not harmful, except to Aluminate Cement	S/E
Sodium Carbonate	Not harmful, except to Aluminate Cement	N/E
Sodium Chloride	Attack in porous or cracked concrete	N/E Penetron will protect rebars
Sodium Cyanide	Disintegrates Slowly	N/E
Sodium Hydroxide 1%-10%	Not harmful	N/E
Sodium Hydroxide 20%-40%	Disintegrates concrete	S/E
Sodium Nitrate	Disintegrates Slowly	N/E
Sodium Phosphate (monobasic)	Disintegrates Slowly	N/E
Sodium Sulfate	Disintegrates concrete	N/E

Sodium Sulfide	Disintegrates concrete	N/E
Sodium Sulfite	Sodium Sulfate, if present, disintegrates concrete	N/E
Sulfuric Acid 10%- 60%	Disintegrates rapidly	E
Sulfuric Acid 60%- 93%	Disintegrates rapidly	E
Sulfurous Acid	Disintegrates rapidly	E
Tannic Acid	Disintegrates Slowly	N/E
Tanning Liquor	Disintegrates, if acid	N/E
Toluol (Toluene)	Liquid loss by penetration	N/E
Vegetables	Disintegrates Slowly	N/E
Wine	Not harmful, necessary to prevent flavor contamination	N/E
Xylol (Xylene)	Liquid loss by penetration	N/E