

# Chemical resistance of Socorex<sup>®</sup> dispensers

## Calibrex<sup>™</sup> models 525 / 530

Bottle-top dispensers are used daily for dispensing a wide range of chemicals. Therefore, instruments have to meet various requirements assuring safety of the laboratory staff and their work. Dispensers shall not release any substances which may interfere with trace analysis, have cytotoxic properties, distort optical tests or influence chromatographic methods and residue analysis.

### Materials

Special attention is given to component materials (see charts below). All parts of the Calibrex<sup>™</sup> dispensers in contact with the liquid are made of robust and chemically inert materials providing for long instrument life.

Parts	Calibrex <sup>™</sup> 525	Calibrex <sup>™</sup> 530
Feed tube	FEP	
Valve body	Ceramic - Aluminum oxide	
Valve balls	Ceramic - Aluminum oxide	
Valve springs	Platinum Iridium	
Plate	PTFE	
Barrel	Borosilicate glass	
Plunger	Ground Borosilicate glass	PFA coated glass
Body	ETFE	
Delivery jet	FEP / PCTFE	
Cap	ETFE	

### Chemicals from A to Z

The following list includes most frequently used chemicals. It provides useful information for the safe and adequate use of Calibrex<sup>™</sup> 525/530 dispensers. However, safety precautions and recommendations in operating instructions must be followed carefully.

### Code explanations

A = Good resistance

B = Acceptable with limitations

C = Not recommended

1 = Possible crystallisation - blockage or possible coating peeling (do not let dry plunger/barrel together).

2 = Swell of plunger protection layer, possible peeling.

3 = Acid vapours (better resistance with lower concentration). Do not leave instrument on bottle.

4 = Risk of damage, softening or discoloration of external parts through vapours. Do not leave instrument on bottle.

5 = Chemical degradation of glass parts (plunger/barrel).

Chemicals A - Z	Calibrex™ 525	Calibrex™ 530
<b>A</b>		
Acetaldehyde (Ethanal)	A	A
Acetic acid 96%	A	B/2
Acetic acid 100% (glacial)	B/4	B/2/4
Acetic anhydride	B/4	B/4
Acetone (Propanone)	A	A
Acetonitrile (MECN)	B/4	B/4
Acetophenone	B/4	B/2/4
Acetyl Chloride	B/4	B/2/4
Acetylacetone	A	A
Acrylic acid	A	A
Acrylonitrile	B/4	B/4
Adipic acid	C/1	A
Allyl alcohol	A	A
Aluminum chloride	C/1	A
Amino acids	C/1	A
Ammonia 20%	B/4	B/4
Ammonia 20-30%	B/4	B/4
Ammonium chloride	C/1	A
Ammonium fluoride	C/1	A
Ammonium molybdate	C/1	A
Ammonium sulfate	C/1	A
Amyl alcohol (Pentanol)	A	A
Amyl chloride (Chloropentane)	B/4	B/2/4
Aniline	A	A
Ascorbic acid	C/1	A
n-Amyl acetate	B/4	B/4
<b>B</b>		
Barium chloride	C/1	A
Benzaldehyde	A	A
Benzene	B/4	B/4
Benzine	A	A
Benzoyl chloride	B/4	B/4
Benzyl alcohol	A	A
Benzyl chloride	B/4	B/4
Bis(2-ethylhexyl) phthalate	B/4	B/4
Boric acid 10%	B/1	A
Bromine	C/4	C/2/4
Bromobenzene	B/4	B/4
Bromonaphtalene	A	A
Butanediol	B/1	A
Butanol	A	A
Butanone (MEK)	C/4	C/4
Butyl acetate	B/4	B/4
Butyl methyl ether	B/4	B/4
Butylamine	B/4	B/4
Butyric acid	B/4	B/4
<b>C</b>		
Calcium carbonate	C/1	B/1
Calcium chloride	C/1	A

Chemicals A - Z	Calibrex™ 525	Calibrex™ 530
<b>C (continued)</b>		
Calcium hydroxide	C/1	B/1
Calcium hypochlorite	C/1	B/1
Carbon disulfide	B/4	B/4
Carbon tetrachloride	B/4	B/4
Chlorine dioxide	B/4	B/2/4
Chloro naphthalene	B/4	B/4
Chloroacetaldehyde 45%	B/1	A
Chloroacetic acid	B/1	A
Chloroacetone	B/4	B/4
Chlorobenzene	B/4	B/4
Chlorobutane	B/4	B/4
Chloroethanol	B/4	B/4
Chloroform	B/4	B/4
Nitro-hydrochloric acid (Aqua regia)	B/4	B/2/4
Chlorosulfuric acid	B/4	B/4
Chlorosulfuric acid 100%	B/3/4	B/3/4
Chromic acid 100%	B/3/4	B/3/4
Chromosulfuric acid 100%	C/1/3/4	B/2/3/4
Citric acid	B/1	A
Copper fluoride	C/1	B/1
Copper sulfate	C/1	A
Cresol	B/1	A
Cumene (Isopropylbenzene)	B/4	B/4
Cyanoacrylate	C/1	C/1
Cyclohexane	B/4	B/4
Cyclohexanone	B/4	B/4
Cyclopentane	B/4	B/4
<b>D</b>		
1,2-Diethylbenzene	B/4	B/4
1,4-Dioxane (Diethylene dioxide)	B/4	B/4
1-Decanol	A	A
Decane	A	A
Di-(2-ethylhexyl) peroxydicarbonate	B/4	B/4
Dibenzyl ether	B/4	B/4
Dichloroacetic acid	A	A
Dichlorobenzene	A	A
Dichloroethane (DCE)	A	A
Dichloromethane (DCM)	B/2/4	B/2/4
Dichloroethylene	B/4	B/4
Diesel oil (Heating oil)	A	A
Diethanolamine	A	A
Diethylamine	B/4	B/4
Diethylene glycol	A	A
Diethylether	B/4	B/4
Dimethyl glycol – Dimethoxyethane (DME)	B/4	B/4
Dimethyl sulfoxide (DMSO)	B/1/4	B/4
Dimethylaniline	A	A

Chemicals A - Z	Calibrex™ 525	Calibrex™ 530
<b>D (continued)</b>		
Dimethylformamide (DMF)	B/4	B/4
Diphenyl ether	B/1/4	B/4
<b>E</b>		
Essentials oils	B/1	B/1
Ethanol	A	A
Ethanolamine	B/4	B/4
Ether	B/4	B/4
Ethyl acetate	B/4	B/4
Ethylbenzene	B/4	B/4
Ethylene chloride	B/4	B/4
Ethylene diamine	A	A
Ethylene glycol	A	A
<b>F</b>		
Fluoroacetic acid	B/1/4	B/4
Formaldehyde (Formalin)	A	A
Formamide	A	A
Formic acid	A	A
<b>G</b>		
Gamma-butyrolactone	A	A
Gasoline	B/4	B/4
Glycerin <40%	A	A
Glycolic acid 50%	B/1	A
<b>H</b>		
Heating oil (Diesel oil)	A	A
Heptane	A	A
Hexane	A	A
Hexanoic acid	B/1	A
Hexanol	A	A
Hydriodic acid	B/4	B/4
Hydrobromic acid	A	A
Hydrochloric acid <20% (HCL) 10 to 100mL	A	A
Hydrochloric acid <20% (HCL) 1 to 5mL	B/1	B/2
Hydrochloric acid 20 to 37% (HCL) 10 to 100mL	B/3/4	B/2/3/4
Hydrochloric acid 20 to 37% (HCL) 1 to 5mL	B/1/3/4	B/2/3/4
Hydrofluoric acid (HF)	C/5	C/5
Hydrogen peroxide	A	B/2
<b>I</b>		
Iodine	C/1	B/1
Iodine bromide	C/4	C/2/4
Iodine chloride	C/4	C/2/4
Isoamyl alcohol	A	A
Isobutanol	A	A
Isooctane	A	A
Isopropanol	A	A
Isopropyl ether	B/4	B/4
Iso-propylamine	B/4	B/4
<b>K</b>		
Kerosene	B/4	B/4
<b>L</b>		
Lactic acid	C/1	A

Chemicals A - Z	Calibrex™ 525	Calibrex™ 530
<b>M</b>		
2-Methoxyethanol	A	A
Methanol	A	A
Methoxybenzene (Anisol)	B/4	B/4
Methyl benzoate	B/1/4	B/4
Methyl chloride (Chloromethane)	B/4	B/4
Methyl formate	A	A
Methyl iodide (Iodomethane)	B/4	B/4
Methyl methacrylate (MMA)	B/4	B/4
Methyl n-buthyl ketone (MBK)	C/4	C/4
Methyl propyl ketone (2-Pentanone)	A	A
Methyl tert-butyl ether	B/4	B/4
Methylene chloride (Dichloromethane) (DCM)	B/4	B/2/4
Methylpentanone	A	A
Mineral oil (engine oil)	A	A
Monochloroacetic acid	B/1	A
<b>N</b>		
N-Butylamine	B/4	B/4
Nitric acid >70% - 10 to 100mL	C/3/4	C/2/3/4
Nitric acid >70% - 1 to 5mL	C/1/3/4	C/2/3/4
Nitric acid 30 to 70% - 10 to 100mL	B/4	B/2/4
Nitric acid 30 to 70% - 1 to 5mL	C/1/4	C/2/4
Nitric acid <30% - 10 to 100mL	A	A
Nitric acid <30% - 1 to 5mL	B/1	B/2
Nitrobenzene	B/4	B/4
Nitro-hydrochloric acid (Aqua regia)	B/4	B/2/4
Nitromethane	B/4	B/4
N-methyl-2-pyrrolidone (NMP)	A	A
<b>O</b>		
Octane	A	A
Octanol	A	A
Oil (vegetable, animal)	B/4	B/4
Oil of turpentine	B/4	B/4
Oleic acid	B/1	A
Oxalic acid	C/1	A
<b>P</b>		
Pentane	B/4	B/4
Peracetic acid	A	A
Perchloric acid 100%	B/4	B/4
Perchloric acid diluted	A	A
Perchloroethylene	B/4	B/4
Petroleum	B/4	B/4
Petroleum ether / spirit	B/4	B/4
Phenol	A	A
Phenylethanol	B/4	B/4
Phenylhydrazine	B/1/4	B/4
Phosphoric acid 100%	A	A
Phosphoric acid 85%	A	A
Piperidine	B/4	B/4
Potassium chloride	C/1	A
Potassium dichromate	C/1	B/1

Chemicals A – Z	Calibrex™ 525	Calibrex™ 530
<b>P</b>		
Potassium hydroxide	C/1	A
Potassium iodide	C/1	A
Potassium permanganate	C/1	B/1
Potassium peroxydisulfate (persulfate)	C/1	B/1
Potassium sulfate	C/1	B/1
Propionic acid (Propanoic acid)	A	A
Propylene glycol (Propane-1,2-diol)	A	A
Propylene oxide	A	A
Pyric acid (Trinitrophenol)	B/4	B/4
Pyridine	B/4	B/4
Pyruvic acid	B/1	A
<b>R</b>		
Resorcin	C/1	A
<b>S</b>		
Salicylaldehyde	A	A
Scintillation fluid	A	A
Silver acetate	C/1	C/1
Silver nitrate	C/1	A
Sodium acetate	C/1	A
Sodium chloride (kitchen salt)	C/1	A
Sodium dichromate	C/1	A
Sodium fluoride	C/1	B/1
Sodium hydroxide 30%	C/1	B/1
Sodium hypochlorite	C/1	B/4
Sodium thiosulfate	C/1	A
Sulfonitric acid 100%	B/3/4	B/2/3/4
Sulfur dioxide	B/4	B/4
Sulfuric acid < 60% 10 to 100mL	A	A
Sulfuric acid < 60% 1 to 5mL	B/1	B/2/3
Sulfuric acid >= 60% 10 to 100mL	B/4	B/2/4
Sulfuric acid >= 60% 1 to 5mL	B/1/3/4	C/2/3/4
<b>T</b>		
1,1,2-Trichlorotrifluoroethane	B/4	B/4
Tartaric acid	C/1	A
Tetrachloroethane	B/4	B/4
Tetrachloroethylene /methylene	B/4	B/4
Tetrahydrofuran (THF)	B/4	B/2/4
Tetramethylammonium hydroxide	C/1/4	B/4
TKN Digest	C/1	B/1/2
Toluene	A	A
Trichlorethylene	B/4	B/4
Trichloroacetic acid	B/1/4	B/4
Trichlorobenzene	B/4	B/4
Trichloroethane	B/4	B/4
Trichloromethane (Chloroform)	B/4	B/4
Triethanolamine	A	A
Triethylene glycol	A	A
Trifluoroacetic anhydride (TFAA)	B/4	B/4
Trifluoromethane (Fluoroform)	B/4	B/4

Chemicals A – Z	Calibrex™ 525	Calibrex™ 530
<b>U</b>		
Urea	C/1	A
<b>X</b>		
Xylene	B/4	B/2/4
<b>Z</b>		
Zinc chloride 10%	C/1	A
Zinc sulfate 10%	C/1	A

The above guidelines have been carefully reviewed prior to publication. Should you require information on chemicals not listed or contribute to some comments, please feel free to contact us.