

# ProMinent® Equipment Catalogue

## Products for:

- **Storage**
- **Transfer**
- **Dosing**
- **Measurement and Control**

**Issued by:**

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Chapter 1 Solenoid-driven metering pumps

Chapter 2 Motor-driven metering pumps

Chapter 3 Process metering pumps

Chapter 4 Dosing systems

**Chapter 5 Tanks and transfer pumps**

Chapter 6 Panel-mounted measuring/  
control stations

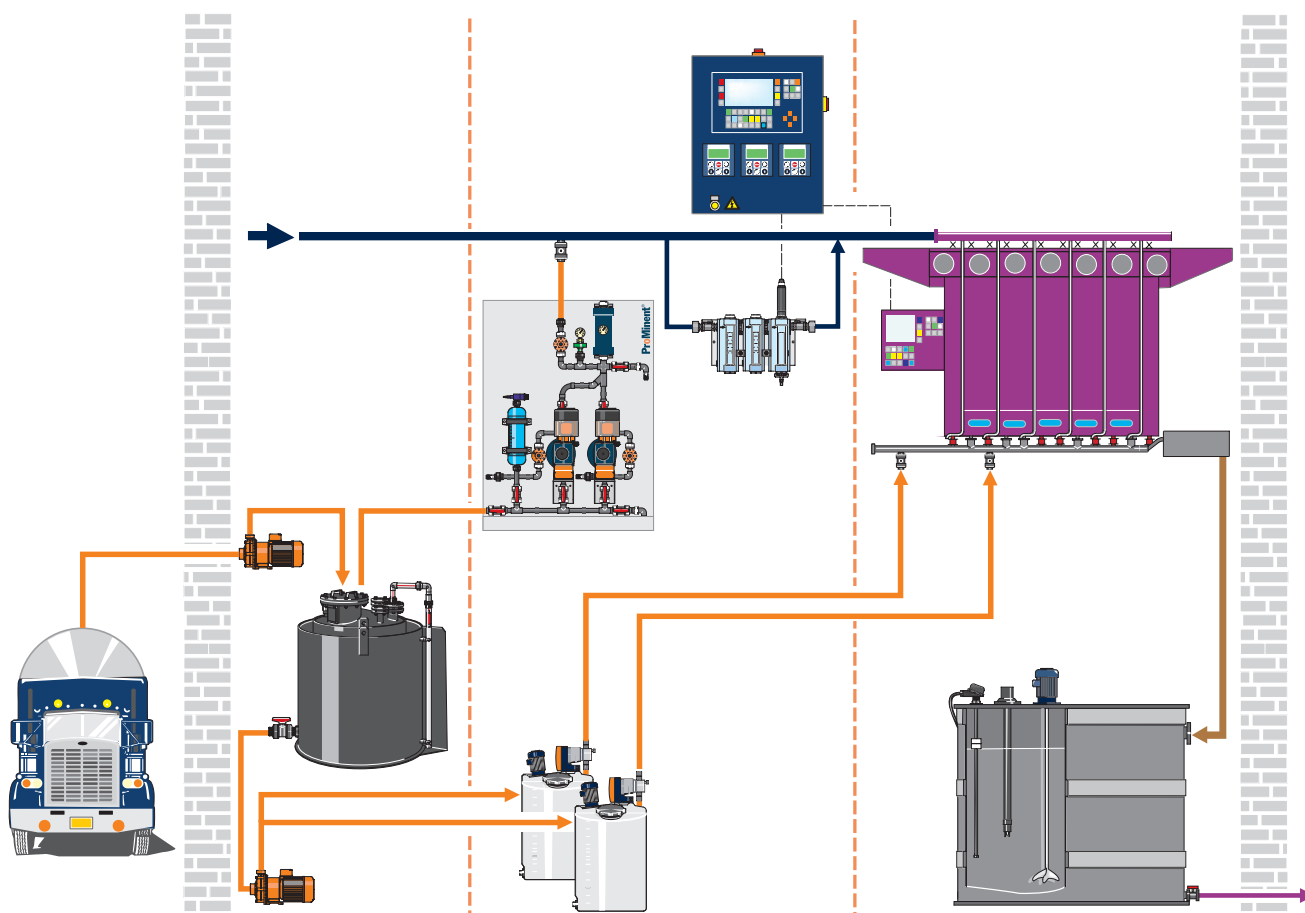
Chapter 7 DULCOTEST<sup>®</sup> sensor technology

Chapter 8 Measuring and control technology

Chapter 9 Domestic water plant

# Overview Chemical Fluid Handling

## Optimum Interaction Of All Components



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ProMinent® solutions store, transfer and meter chemicals – in amounts ranging from 0.1 l/h to 40,000 l/h at pressures of 2 to 3,000 bar. In every industrial environment: whether in a simple control loop or a complex field bus application – solutions from ProMinent are simple and efficient.

Automated systems improve the quality of your processes thanks to reliable metering. This increases the quality of your products, saves chemicals, improves environmental compatibility and lowers the costs of wastewater disposal. You also need fewer operating personnel.

Three criteria determine the design of a chemical fluid handling solution: The chemical being handled, the required level of reproducibility and the system control requirements.

- **Storage and transfer**

ProMinent® storage and metering tanks make chemicals available wherever they are required. Matching transfer pumps ensure problem-free transference.

- **Metering/Measuring/Controlling**

ProMinent offers dosing systems with maximum levels of resistance against practically all types and concentrations of chemicals. The accuracy of the metering is determined not just by the pump but also by their interaction with selected accessories. Whether the pump is calibrated once and then meters continuously or whether simple measured variable-dependant metering or integration into a field bus environment is required: thanks to its broad product range ProMinent offers the right pumps, the optimum measurement and control systems and perfectly interacting accessories for all industry requirements.

- **Wastewater treatment**

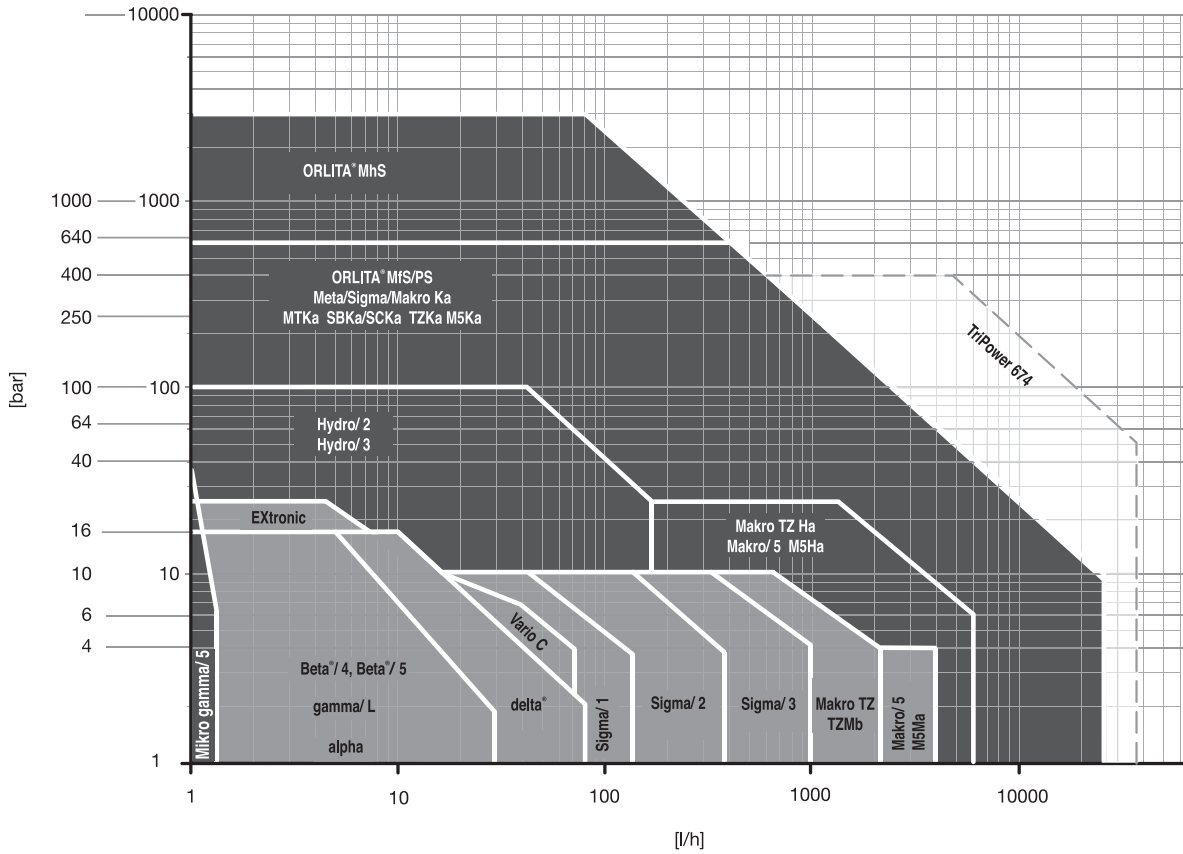
pH-correction or specialist detoxification ensures that wastewater can be safely disposed of via the public drainage system.

# Capacity Data

## Capacity Data Metering Pumps

The following summary of the capacity data for the comprehensive ProMinent® metering pump range facilitates pump selection based on a given back pressure (bar) and feed rate (l/h).

When selecting a pump type, please specify the co-ordinate of the back pressure (bar) and feed rate (l/h).



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pressure [bar] over Feed quantity [l/h]

# Data Required For Specification Of Dosing Pump And Accessories

## Pump Specification Data

Min./max. required feed rate l/h \_\_\_\_\_  
 Available power supply \_\_\_\_\_ V, \_\_\_\_\_ Hz  
 Min./max. operating temperature °C \_\_\_\_\_  
 Properties of process chemical \_\_\_\_\_  
 Name, concentration % \_\_\_\_\_  
 Solids content % \_\_\_\_\_  
 Dynamic viscosity mPa (= cP) \_\_\_\_\_  
 Vapour pressure at operating temperature bar \_\_\_\_\_  
 Remarks, e.g. abrasive, \_\_\_\_\_  
 gaseous, flammable, \_\_\_\_\_  
 corrosive towards \_\_\_\_\_

### Suction conditions:

Min./max. suction lift m \_\_\_\_\_  
 Min./max. positive suction head m \_\_\_\_\_  
 Pressure in chemical tank bar \_\_\_\_\_  
 Suction line length m \_\_\_\_\_  
 Suction line diameter mm \_\_\_\_\_

### Discharge conditions:

Min./max. back pressure bar \_\_\_\_\_  
 Min./max. discharge head m \_\_\_\_\_  
 Min./max. negative discharge head m \_\_\_\_\_  
 Discharge line length m \_\_\_\_\_  
 Discharge line diameter mm \_\_\_\_\_  
 Number of valves and fittings in suction and discharge line \_\_\_\_\_

### Data required for proportional dosing:

Water flow Q min./max. m<sup>3</sup>/h \_\_\_\_\_  
 Required final concentration g/m<sup>3</sup>, ppm \_\_\_\_\_

### Example:

A required dose in mg/l = g/m<sup>3</sup> = ppm

(Water flow Q max. 50 m<sup>3</sup>/h)

Pulse spacing (flow volume per pulse) of water meter 5 l.

Process fluid = sodium hypochlorite solution Na OCl with 12 % chlorine (by weight) = 120 g/kg = 150 g/l = 150 mg/ml

Selected dosing pump GALa 1005 NPB2 with 0.41 ml/per stroke volume, at max. 10800 strokes/h.

Variables: pump type, pulse spacing and concentration. The stroke rate (max. throughput l/h: pulse spacing l/pulse = 50,000 l/h : 5 l/pulse = 10000 pulses/h) must not exceed the max. stroke frequency (10800 strokes/h) of the dosing pump.

$$\text{Feed quantity} = \frac{\text{water throughput Q max. (l/h)} \times \text{stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{50,000 \text{ l} \times 0.00041 \text{ l}}{\text{h} \times 5 \text{ l}} = 4.1 \text{ l/h}$$

$$\begin{aligned} \text{Final dose} &= \frac{\text{concentration (mg/ml)} \times \text{stroke volume (l)}}{\text{pulse spacing (l)}} = \frac{150 \text{ mg} \times 0.41 \text{ ml}}{\text{ml} \times 5 \text{ l}} = 12.3 \text{ mg/l} \\ &= 12.3 \text{ g/m}^3 \\ &= 12.3 \text{ ppm chlorine Cl}_2 \end{aligned}$$

pk\_0\_002

# ProMinent® Chemical Resistance List

## Resistance of Materials Used in Liquid Ends to the Chemicals Most Frequently Used

The data apply to standard conditions (20 °C, 1,013 mbar).

s	= saturated solution in water
+	= resistant
+/o	= largely resistant
o	= conditionally resistant
-	= not resistant
n	= resistance not known
=>	= see
*	= For bonded connections, the resistance of the adhesive (e.g. Tangit) is to be considered. (Materials of the types 'o' and '-' are not recommended !)
**	= does not apply to glass fibre reinforced material

Concentration data are stated in weight percent, referred to aqueous solutions. If percentages are stated for the level of resistance, this level of resistance is only valid up to this concentration.

### NOTE:

The elastomers **CSM (Hypalon®)** and **IIR (butyl rubber)** used as diaphragm materials in pulsation dampers have properties similar to **EPDM**.

**PTFE** is resistant to all chemicals in this list.

**PTFE filled with carbon**, however, is attacked by strong oxidants such as bromine (anhydrous) or concentrated acids (phosphoric acid, sulphuric acid, chromic acid).

The resistance of PVC-U adhesive joints with Tangit deviates from the list below with regard to the following chemicals:

Medium	Concentration range
Sulfochromic acid	$\geq 70\% \text{ H}_2\text{SO}_4 + 5\% \text{ K}_2\text{Cr}_2\text{O}_7/\text{Na}_2\text{Cr}_2\text{O}_7$
Chromic acid	$\geq 10\% \text{ CrO}_3$
Hydrochloric acid	$\geq 25\% \text{ HCl}$
Sodium hypochlorite (calcium hypochlorite)	$\geq 6\% \text{ NaOCl}$
Hydrogen peroxide	$\geq 5\% \text{ H}_2\text{O}_2$
Hydrofluoric acid	$\geq 0\% \text{ HF}$

Viton® is a registered trademark of DuPont Dow Elastomers

### Water pollution classes (WPC):

1	= slightly hazardous to water
2	= hazardous to water
3	= severely hazardous to water
(X)	= No classification. Classification according to conclusion by analogy. To be used under reserve.

The data has been taken from relevant manufacturer's documentation and our own tests. Resistance of materials is also dependant on other factors, e.g. operating conditions, conditions of surfaces etc., and so this list must be treated as an initial guide only. It cannot claim to offer any guarantees. It should be taken into consideration in particular that usual dosing media are compounds for the most part, and their corrosiveness cannot be deducted simply by adding the corrosiveness of each single component. In such cases the chemical producers' data of the material compatibility are to be considered as a matter of prime importance for the material choice. A safety data sheet does not give these data and therefore cannot take the place of the technical documentation on the application.

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Acetaldehyde	CH <sub>3</sub> CHO	100%	-	-	o	-	+	-	+/o	-	-	+	+	2
Acetamide	CH <sub>3</sub> CONH <sub>2</sub>	s	+	+	+	+	+	o	+	-	+/o	+	+	1
Acetic Acid	CH <sub>3</sub> COOH	100%	-	50%	+	+	+	-	o	60%	60%	70%	+	1
Acetic Anhydride	(CH <sub>3</sub> CO) <sub>2</sub> O	100%	-	-	o	-	+	-	+/o	-	+	o	+	1
Acetic Ether => Ethyl Acetate														
Acetone	CH <sub>3</sub> COCH <sub>3</sub>	100%	-	-	+	-	+	-	+	-	-	+	+	1
Acetophenone	C <sub>6</sub> H <sub>5</sub> COCH <sub>3</sub>	100%	-	n	+	-	+	-	+	n	n	+	+	1
Acetyl Chloride	CH <sub>3</sub> COCl	100%	-	+	n	-	o	+	-	-	o	n	+	1
Acetylacetone	CH <sub>3</sub> COCH <sub>2</sub> COCH <sub>3</sub>	100%	-	-	+	-	+	-	+	n	n	+	+	1
Acetylene Dichloride => Dichloro Ethylene														
Acetylene Tetrachloride => Tetrachloro Ethane														
Acrylonitril	CH <sub>2</sub> =CH-CN	100%	-	-	+	+	+	-	-	-	-	+	+	3
Adipic Acid	HOOC(CH <sub>2</sub> ) <sub>4</sub> COOH	s	+	+	+	+	+	+	+	-	+/o	+	+	1
Allyl Alcohol	CH <sub>2</sub> CHCH <sub>2</sub> OH	96%	-	o	+	+	+	-	+	-	o	+	+/o	2
Aluminium Acetate	Al(CH <sub>3</sub> COO) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	1
Aluminium Bromide	AlBr <sub>3</sub>	s	+	+	+	+	n	+	+	+	+	+	+	2
Aluminium Chloride	AlCl <sub>3</sub>	s	+	+	+	+	-	+	+	+	+	+	+	1
Aluminium Fluoride	AlF <sub>3</sub>	10%	+	+	+	+	+	+	+	+	+	+	+/o	1
Aluminium Hydroxide	Al(OH) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Aluminium Nitrate	Al(NO <sub>3</sub> ) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Aluminium Phosphate	AlPO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Aluminium Sulphate	Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Acetate	CH <sub>3</sub> COONH <sub>4</sub>	s	+	+/o	+	+	+	+	+	+	+	+	+	1
Ammonium Bicarbonate	NH <sub>4</sub> HCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Carbonate	(NH <sub>4</sub> ) <sub>2</sub> CO <sub>3</sub>	40%	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Chloride	NH <sub>4</sub> Cl	s	+	+	+	+	-	+	+	+	+	+	+/o	1
Ammonium Fluoride	NH <sub>4</sub> F	s	+	o	+	+	o	+	+	+	+	+	+	1
Ammonium Hydroxide	"NH <sub>4</sub> OH"	s	+	+	+	o	+	-	+	+	+	+	+	2
Ammonium Nitrate	NH <sub>4</sub> NO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Oxalate	(COONH <sub>4</sub> ) <sub>2</sub> * H <sub>2</sub> O	s	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Perchlorate	NH <sub>4</sub> ClO <sub>4</sub>	10%	+	+	+	+	+	+	+	+	+	+	+	1
Ammonium Peroxodisulphate	(NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	s	+	+	+	+	5%	+	+	+	+	+	5%	2
Ammonium Phosphate	(NH <sub>4</sub> ) <sub>3</sub> PO <sub>4</sub>	s	+	+	+	+	10%	+	+	+	+	+	10%	1
Ammonium Sulphate	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	s	+	+	+	+	10%	+	+	+	+	+	10%	1
Ammonium Sulphide	(NH <sub>4</sub> ) <sub>2</sub> S	s	+	+	+	+	n	+	+	n	n	+	n	2
Ammoniumaluminium Sulphate	NH <sub>4</sub> Al(SO <sub>4</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Amyl Alcohol	C <sub>5</sub> H <sub>11</sub> OH	100%	+	+	+	+	+	-	+	-	-	+	+	1
Aniline	C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>	100%	-	-	+	+	+	-	+/o	-	o	+	+	2
Aniline Hydrochloride	C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub> * HCl	s	n	+	+	+	-	+/o	+/o	-	o	+	+	2
Antimony Trichloride	SbCl <sub>3</sub>	s	+	+	+	+	-	+	+	+	+	+	n	2
Aqua Regia	3 HCl + HNO <sub>3</sub>	100%	-	+	-	+	-	-	o	-	-	-	-	2
Arsenic Acid	H <sub>3</sub> AsO <sub>4</sub>	s	+	+	+	+	+	+	+	20%	o	+	+	3
Barium Carbonate	BaCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Barium Chloride	BaCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	1
Barium Hydroxide	Ba(OH) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Barium Nitrate	Ba(NO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Barium Sulphate	BaSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Barium Sulphide	BaS	s	+	+	+	+	+	+	+	+	+	+	+	(1)
Benzaldehyde	C <sub>6</sub> H <sub>5</sub> CHO	100%	-	-	+	-	+	+	+	-	-	o	+	1
Benzene	C <sub>6</sub> H <sub>6</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	3
Benzene Sulphonic Acid	C <sub>6</sub> H <sub>5</sub> SO <sub>3</sub> H	10%	n	n	+	+	+	+	-	-	-	n	+	2
Benzoic Acid	C <sub>6</sub> H <sub>5</sub> COOH	s	+	+	+	+	+	+	+	-	+/o	+	+	1
Benzoyl Chloride	C <sub>6</sub> H <sub>5</sub> COCl	100%	-	n	o	n	o	+	+	n	n	o	+	2
Benzyl Alcohol	C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> OH	100%	-	-	+	+	+	+	-	-	+	+	+	1
Benzyl Benzoate	C <sub>6</sub> H <sub>5</sub> COOC <sub>7</sub> H <sub>7</sub>	100%	-	-	+	o	+	+	-	-	-	+	+	2
Benzyl Chloride	C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> Cl	90%	-	n	o	+	+	+	-	-	-	o	+	2
Bitter Salt => Magnesium Sulphate														
Bleach => Sodium Hypochlorite														
Blue Vitriol => Copper Sulphate														
Borax => Sodium Tetraborate														
Boric Acid	H <sub>3</sub> BO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Brine		s	+	+/o	+	+	+/o	+	+	+	+	+	+	1
Bromine (dry)	Br <sub>2</sub>	100%	-	-	-	+	-	-	-	-	-	-	+	2
Bromine Water	Br <sub>2</sub> + H <sub>2</sub> O	s	-	+	-	+	-	-	-	n	n	-	n	(2)
Bromo Benzene	C <sub>6</sub> H <sub>5</sub> Br	100%	n	n	o	+	+	o	-	-	-	o	+	2
Bromochloro Methane	CH <sub>2</sub> BrCl	100%	-	-	-	+	+	n	+/o	-	-	o	+	2
Bromochlorotrifluoro Ethane	HCClBrCF <sub>3</sub>	100%	-	-	o	+	+	+	-	+	+	o	+	(3)
Butanediol	HOC <sub>4</sub> H <sub>8</sub> OH	10%	n	+	+	+	+	o	+	+	+	+	+	1
Butanetriol	C <sub>4</sub> H <sub>10</sub> O <sub>3</sub>	s	+	+	+	+	+	o	+	+	+	+	+	1

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Butanol	C <sub>4</sub> H <sub>9</sub> OH	100%	-	+	+	+	+	o	+/o	-	-	+	+	1
Butyl Acetate	C <sub>7</sub> H <sub>13</sub> O <sub>2</sub>	100%	-	-	+	+	+	-	-	-	+/o	+	+	1
Butyl Acetate	CH <sub>3</sub> COOC <sub>4</sub> H <sub>9</sub>	100%	-	-	o	+	+	-	+/o	-	+/o	-	+	1
Butyl Alcohol => Butanol														
Butyl Amine	C <sub>4</sub> H <sub>9</sub> NH <sub>2</sub>	100%	n	n	n	-	+	-	-	n	n	+	+	1
Butyl Benzoate	C <sub>6</sub> H <sub>5</sub> COOC <sub>4</sub> H <sub>9</sub>	100%	-	-	o	n	+	+	+	-	-	o	+	2
Butyl Mercaptane	C <sub>4</sub> H <sub>9</sub> SH	100%	n	n	n	+	n	+	-	n	n	n	n	3
Butyl Oleate	C <sub>22</sub> H <sub>42</sub> O <sub>2</sub>	100%	n	n	n	+	+	+	+/o	n	n	n	+	1
Butyl Stearate	C <sub>22</sub> H <sub>44</sub> O <sub>2</sub>	100%	o	n	n	+	+	+	-	n	n	n	+	1
Butyraldehyde	C <sub>3</sub> H <sub>7</sub> CHO	100%	-	n	+	n	+	-	+/o	-	-	+	+	1
Butyric Acid	C <sub>3</sub> H <sub>7</sub> COOH	100%	5%	20%	+	+	+	+	+	-	+/o	+	+	1
Calcium Acetate	(CH <sub>3</sub> COO) <sub>2</sub> Ca	s	+	+	+	+	+	+	+	+	+	+	+	1
Calcium Bisulphite	Ca(HSO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(1)
Calcium Carbonate	CaCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Calcium Chloride	CaCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	1
Calcium Cyanide	Ca(CN) <sub>2</sub>	s	+	+	+	+	n	+	+	+	+	+	n	3
Calcium Hydroxide	Ca(OH) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Calcium Hypochlorite	Ca(OCl) <sub>2</sub>	s	+	+	o	+	-	o	+	+	+	+	+	2
Calcium Nitrate	Ca(NO <sub>3</sub> ) <sub>2</sub>	s	+	50%	50%	+	+	+	+	+	+	+	+	1
Calcium Phosphate	Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Calcium Sulphate	CaSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Calcium Sulphide	CaS	s	+	+	+	+	n	+	+	+	+	+	+	(2)
Calcium Sulphite	CaSO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(1)
Calcium Thiosulphate	CaS <sub>2</sub> O <sub>3</sub>	s	+	+	+	+	-	+	+	+	+	+	+	1
Carbolic Acid => Phenole														
Carbon Disulphide	CS <sub>2</sub>	100%	-	-	o	+	+	+	-	-	-	o	+	2
Carbon Tetrachloride	CCl <sub>4</sub>	100%	-	-	-	+	+	+	-	-	-	o	+	3
Carbonic Acid	"H <sub>2</sub> CO <sub>3</sub> "	s	+	+	+	+	+	+	+	+	+	+	+	1
Caustic Potash => Potassium Hydroxide														
Caustic Soda => Sodium Hydroxide														
Chloric Acid	HClO <sub>3</sub>	20%	+	+	-	+	-	o	o	+	+	10%	+	2
Chlorinated Lime => Calcium Hypochlorite														
Chlorine Dioxide Solution	ClO <sub>2</sub> + H <sub>2</sub> O	0.5%	o	+	o	+	-	o	-	o	-	o	+	
Chlorine Water	Cl <sub>2</sub> + H <sub>2</sub> O	s	o	+	o	+	-	+	+	o	-	o	+	
Chloro Benzene	C <sub>6</sub> H <sub>5</sub> Cl	100%	-	-	+	+	+	+	-	-	-	o	+	2
Chloro Ethanol	ClCH <sub>2</sub> CH <sub>2</sub> OH	100%	-	-	+	o	+	-	o	-	+	+	+	3
Chloro Ethylbenzene	C <sub>6</sub> H <sub>4</sub> ClC <sub>2</sub> H <sub>5</sub>	100%	-	-	o	n	+	o	-	-	-	o	+	(2)
Chloro Phenole	C <sub>6</sub> H <sub>4</sub> OHCl	100%	-	n	+	+	+	n	-	-	-	+	+	2
Chloro Toluene	C <sub>7</sub> H <sub>8</sub> Cl	100%	-	-	n	+	+	+	-	-	-	n	+	2
Chloroacetone	C <sub>1</sub> H <sub>2</sub> COCH <sub>3</sub>	100%	-	-	n	n	+	-	+	-	-	n	+	3
Chlorobutadiene	C <sub>4</sub> H <sub>6</sub> Cl	100%	-	-	n	n	+	+	-	-	-	n	+	1
Chloroform	CHCl <sub>3</sub>	100%	-	-	o	+	+	+	-	-	o	-	+	2
Chlorohydrin	C <sub>3</sub> H <sub>5</sub> OCl	100%	-	n	+	-	+	+	o	-	+	+	+	3
Chloroprene => Chlorobutadiene														
Chlorosulphonic Acid	SO <sub>2</sub> (OH)Cl	100%	-	o	-	+	-	-	-	-	-	-	o	1
Chrome-alum => Potassium Chrome Sulphate														
Chromic Acid	H <sub>2</sub> CrO <sub>4</sub>	50%	-	+	o	+	10%	+	-	o	o	+	10%	3
Chromic-Sulphuric Acid	K <sub>2</sub> CrO <sub>4</sub> + H <sub>2</sub> SO <sub>4</sub>	s	-	+	-	+	n	n	n	-	-	-	n	3
Chromium Sulphate	Cr <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Citric Acid	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Cobalt Chloride	CoCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	2
Copper-II-Acetate	Cu(CH <sub>3</sub> COO) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Copper-II-Arsenite	Cu <sub>3</sub> (AsO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Copper-II-Carbonate	CuCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Copper-II-Chloride	CuCl <sub>2</sub>	s	+	+	+	+	1%	+	+	+	+	+	+	2
Copper-II-Cyanide	Cu(CN) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(3)
Copper-II-Fluoride	CuF <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(2)
Copper-II-Nitrate	Cu(NO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	2
Copper-II-Sulphate	CuSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Cresols	C <sub>6</sub> H <sub>4</sub> CH <sub>3</sub> OH	100%	o	o	+	+	+	+	-	-	-	+	+	2
Crotonaldehyde	CH <sub>3</sub> C <sub>2</sub> H <sub>2</sub> CHO	100%	n	-	+	+	+	-	+	-	-	+	+	3
Cubic Nitre => Sodium Nitrate														
Cumene => Isopropyl Benzene														
Cyclo Hexane	C <sub>6</sub> H <sub>12</sub>	100%	+	-	+	+	+	+	-	-	-	+	o	1
Cyclohexanole	C <sub>6</sub> H <sub>11</sub> OH	100%	o	+/o	+	+	+	+	-	-	-	+	+	1
Cyclohexanone	C <sub>6</sub> H <sub>10</sub> O	100%	-	-	+	-	+	-	+/o	-	-	+	+	1
Cyclohexyl Alcohol => Cyclohexanol														
Cyclohexylamine	C <sub>6</sub> H <sub>11</sub> NH <sub>2</sub>	100%	n	n	n	n	+	-	n	n	n	n	+	2
Decahydronaphthaline	C <sub>10</sub> H <sub>18</sub>	100%	-	+/o	o	+	n	o	-	-	-	o	+	2



# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Decaline => Decahydronaphthalene														
Dextrose => Glucose														
Diacetonolcohol	C <sub>6</sub> H <sub>12</sub> O <sub>2</sub>	100%	-	-	+	o	+	-	+	-	-	+	+	1
Dibromoethane	C <sub>2</sub> H <sub>4</sub> Br <sub>2</sub>	100%	-	-	n	+	+	+	-	-	-	-	+	3
Dibutyl Ether	C <sub>4</sub> H <sub>9</sub> OC <sub>4</sub> H <sub>9</sub>	100%	-	-	+	+	+	-	o	-	-	+	+	2
Dibutyl Phthalate	C <sub>16</sub> H <sub>22</sub> O <sub>4</sub>	100%	-	-	+	+	+	+	+/o	o	+	+	+	2
Dibutylamine	(C <sub>4</sub> H <sub>9</sub> ) <sub>2</sub> NH	100%	n	n	+	+	+	-	-	n	n	+	+	1
Dichloro Acetic Acid	Cl <sub>2</sub> CHCOOH	100%	-	+	+	+	+	-	+	-	o	+	+	1
Dichloro Benzene	C <sub>6</sub> H <sub>4</sub> Cl <sub>2</sub>	100%	-	-	o	+	+	+	-	-	-	o	+	2
Dichloro Butan	C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub>	100%	-	-	o	+	+	+	-	-	-	o	+	3
Dichloro Butene	C <sub>4</sub> H <sub>6</sub> Cl <sub>2</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	3
Dichloro Ethane	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	100%	-	-	o	+	+	+	+	-	o	-	+	3
Dichloro Ethylene	C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub>	100%	-	-	o	+	+	o	-	-	o	-	+	2
Dichloro Methane	CH <sub>2</sub> Cl <sub>2</sub>	100%	-	-	o	o	o	+	-	-	o	-	+	2
Dichloroisopropyl Ether	(C <sub>3</sub> H <sub>6</sub> Cl) <sub>2</sub> O	100%	-	-	o	n	+	o	o	-	-	o	+	(2)
Dicyclohexylamine	(C <sub>6</sub> H <sub>11</sub> ) <sub>2</sub> NH	100%	-	-	o	n	+	-	-	-	-	o	+	2
Diethyleneglycol	C <sub>4</sub> H <sub>10</sub> O <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Diethyleneglycolethyl Ether	C <sub>8</sub> H <sub>18</sub> O <sub>3</sub>	100%	n	n	+	+	+	n	+/o	-	o	+	+	1
Diethylether	C <sub>2</sub> H <sub>5</sub> OC <sub>2</sub> H <sub>5</sub>	100%	-	-	o	+	+	-	-	-	o	o	+	1
Diglycolic Acid	C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>	30%	+	+	+	+	+	+	n	+	+/o	+	+	3
Dihexyl Phthalate	C <sub>20</sub> H <sub>26</sub> O <sub>4</sub>	100%	-	-	+	+	+	-	n	o	+	+	+	(1)
Diisobutylketone	C <sub>9</sub> H <sub>18</sub> O	100%	-	-	+	+	+	-	+	-	-	+	+	1
Di-iso-nonyl Phthalate	C <sub>26</sub> H <sub>42</sub> O <sub>4</sub>	100%	-	-	+	+	+	n	n	o	+	+	+	1
Diisopropylketone	C <sub>7</sub> H <sub>14</sub> O	100%	-	-	+	+	+	-	+	-	-	+	+	1
Dimethyl Carbonate	(CH <sub>3</sub> O) <sub>2</sub> CO	100%	n	n	+	+	+	+	-	n	n	+	+	1
Dimethyl Ketone => Acetone														
Dimethyl Phthalate	C <sub>10</sub> H <sub>10</sub> O <sub>4</sub>	100%	-	-	+	+	+	-	+/o	o	+	+	+	1
Dimethylformamide	HCON(CH <sub>3</sub> ) <sub>2</sub>	100%	-	-	+	-	+	-	+	-	+/o	+	+	1
Dimethylhydrazine	H <sub>2</sub> NN(CH <sub>3</sub> ) <sub>2</sub>	100%	n	n	+	n	+	-	+	n	n	+	+	3
Diocetyl Phthalate	C <sub>4</sub> H <sub>4</sub> (COOC <sub>8</sub> H <sub>17</sub> ) <sub>2</sub>	100%	-	-	+	+	+	-	+/o	o	+	+	+	1
Dioxane	C <sub>4</sub> H <sub>8</sub> O <sub>2</sub>	100%	-	-	o	-	+	-	+/o	-	-	+	+	1
Disodium Hydrogenphosphate	Na <sub>2</sub> HPO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Disulfur Acid -- Oleum														
Disulphur Dichloride	S <sub>2</sub> Cl <sub>2</sub>	100%	n	n	n	+	n	+	-	-	-	n	n	
DMF => Dimethylformamide														
Engine Oils		100 %	n	+/o	+	+	+	+	-	-	-	+	+	2
Epsom salts => Magnesium Sulphate														
Ethanol	C <sub>2</sub> H <sub>5</sub> OH	100%	-	+	+	+	+	-	+	-	+	+	+	1
Ethanol Amine	HOC <sub>2</sub> H <sub>4</sub> NH <sub>2</sub>	100%	o	n	+	-	+	-	+/o	-	o	+	+	1
Ethyl Acetate	CH <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	100%	-	-	35%	+	+	-	+/o	-	+/o	+	+	1
Ethyl Acrylate	C <sub>2</sub> H <sub>3</sub> COOC <sub>2</sub> H <sub>5</sub>	100%	-	-	+	o	+	-	+/o	-	-	+	+	2
Ethyl Benzene	C <sub>6</sub> H <sub>5</sub> -C <sub>2</sub> H <sub>5</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	1
Ethyl Benzoate	C <sub>6</sub> H <sub>5</sub> COOC <sub>2</sub> H <sub>5</sub>	100%	n	-	+	o	+	+	-	-	-	+	+	1
Ethyl Bromide	C <sub>2</sub> H <sub>5</sub> Br	100%	-	n	+	+	n	+	-	-	o	+	+	2
Ethyl Chloroacetate	ClCH <sub>2</sub> COOC <sub>2</sub> H <sub>5</sub>	100%	-	o	+	+	+	+	-	-	-	+	+	2
Ethyl Chlorocarbonate	ClCO <sub>2</sub> C <sub>2</sub> H <sub>5</sub>	100%	n	n	n	n	n	+	-	n	n	n	n	(2)
Ethyl Cyclopentane	C <sub>5</sub> H <sub>4</sub> C <sub>2</sub> H <sub>5</sub>	100%	+	+	+	+	+	+	-	-	-	+	+	(1)
Ethylacetacetate	C <sub>6</sub> H <sub>10</sub> O <sub>3</sub>	100%	n	-	+	+	+	-	+/o	-	+/o	+	+	1
Ethylacrylic Acid	C <sub>4</sub> H <sub>7</sub> COOH	100%	n	n	+	+	+	n	+/o	n	n	+	+	(1)
Ethylene Diamine	(CH <sub>2</sub> NH <sub>2</sub> ) <sub>2</sub>	100%	o	o	+	-	o	-	+	n	n	+	o	2
Ethylene Dibromide => Dibromoethane														
Ethylene Dichloride => Dichloro Ethane														
Ethylene Glycol => Glycol														
Ethylenglycol Ethylether	HOC <sub>2</sub> H <sub>4</sub> OC <sub>2</sub> H <sub>5</sub>	100%	n	n	+	+	+	n	+/o	-	o	+	+	1
Ethylhexanol	C <sub>8</sub> H <sub>16</sub> O	100%	n	+/o	+	+	+	+	+	-	-	+	+	2
Fatty Acids	R-COOH	100%	+	+	+	+	+	+	o	-	o	+	+	1
Ferric Chloride	FeCl <sub>3</sub>	s	+	+	+	+	-	+	+	+	+	+	+/o	1
Ferric Nitrate	Fe(NO <sub>3</sub> ) <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Ferric Phosphate	FePO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Ferric Sulphate	Fe <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	s	+	+	+	+	o	+	+	+	+	+	+	1
Ferrous Chloride	FeCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+/o	1
Ferrous Sulphate	FeSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Fixing Salt => Sodium Thiosulphate														
Fluoro Benzene	C <sub>6</sub> H <sub>5</sub> F	100%	-	-	+	+	+	o	-	-	-	o	+	2
Fluoroboric Acid	HF <sub>3</sub>	35%	+	+	+	+	o	+	+	+	-	+	+	1
Fluorosilicic Acid	H <sub>2</sub> SiF <sub>6</sub>	100%	+	30%	30%	+	o	+	+	25%	o	40%	+/o	2
Formaldehyde	CH <sub>2</sub> O	40%	+	+	+	+	+	-	+/o	-	-	+	+	2
Formalin => Formaldehyde														
Formamide	HCONH <sub>2</sub>	100%	+	-	+	+	+	+	+	n	n	+	+	1

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Formic Acid	HCOOH	s	-	+/o	+	+	+	-	-	+/o	+/o	+	+	1
Furane	C <sub>4</sub> H <sub>4</sub> O	100%	-	-	+	-	+	-	n	-	-	+	+	3
Furane Aldehyde	C <sub>5</sub> H <sub>5</sub> O <sub>2</sub>	100%	n	n	n	o	+	-	+/o	-	-	n	n	2
Furfuryl Alcohol	OC <sub>4</sub> H <sub>3</sub> CH <sub>2</sub> OH	100%	-	-	+	o	+	n	+/o	-	-	+	+	1
Gallic Acid	C <sub>6</sub> H <sub>2</sub> (OH) <sub>3</sub> COOH	5%	+	+	+	+	+	+	+/o	+	+	+	+	1
Gasoline		100 %	-	-	+	+	+	+	-	-	-	+	+	2
Glauber's Salt => Sodium Sulphate														
Glucose	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Glycerol	C <sub>3</sub> H <sub>5</sub> (OH) <sub>3</sub>	100%	+	+	+	+	+	+	+	+	+	+	+	1
Glycerol Triacetate	C <sub>3</sub> H <sub>5</sub> (CH <sub>3</sub> COO) <sub>3</sub>	100%	n	n	+	+	+	-	+	n	n	+	+	1
Glycine	NH <sub>2</sub> CH <sub>2</sub> COOH	10%	+	+	+	+	+	+	+	+	+	+	+	1
Glycol	C <sub>2</sub> H <sub>4</sub> (OH) <sub>2</sub>	100%	+	+	+	+	+	+	+	+	+	+	+	1
Glycolic Acid	CH <sub>2</sub> OHCOOH	70%	+	37%	+	+	+	+	+	+	+/o	+	+	1
Gypsum => Calcium Sulphate														
Heptane	C <sub>7</sub> H <sub>16</sub>	100%	+	+	+	+	+	-	-	-	-	+	+	1
Hexachloroplatinic Acid	H <sub>2</sub> PtCl <sub>6</sub>	s	n	+	+	+	-	n	+	n	n	+	-	
Hexanal	C <sub>5</sub> H <sub>11</sub> CHO	100%	n	n	+	+	+	-	+/o	-	-	+	+	1
Hexane	C <sub>6</sub> H <sub>14</sub>	100%	+	+	+	+	+	-	-	-	-	+	+	1
Hexanol	C <sub>6</sub> H <sub>13</sub> OH	100%	-	-	+	+	+	n	+	-	o	+	+	1
Hexantriol	C <sub>6</sub> H <sub>9</sub> (OH) <sub>3</sub>	100%	n	n	+	+	+	+	+	n	n	+	+	1
Hexene	C <sub>6</sub> H <sub>12</sub>	100%	n	+	+	+	+	+	-	-	-	+	+	1
Hydrazine Hydrate	N <sub>2</sub> H <sub>4</sub> * H <sub>2</sub> O	s	+	+	+	+	+	n	+	-	o	+	+	3
Hydrobromic Acid	HBr	50%	+	+	+	+	-	-	+	+	-	+	o	1
Hydrochloric Acid	HCl	38%	32%	+	+	+	-	+	-	+	o	+	o	1
Hydrofluoric Acid	HF	80%	-	40%*	40%**	+	-	+	o	40%	-	40%	+/o	1
Hydrogen Cyanide	HCN	s	+	+	+	+	+	+	+	+	+	+	+	3
Hydrogen Peroxide	H <sub>2</sub> O <sub>2</sub>	90%	40%	40%*	30%	+	+	30%	30%	30%	+	+	+	1
Hydroiodic Acid	HI	s	+	+	+	+	-	-	n	+	-	+	n	1
Hydroquinone	C <sub>6</sub> H <sub>4</sub> (OH) <sub>2</sub>	s	o	+	+	+	+	+	-	+	+/o	+	+	2
Hydroxylamine Sulphate	(NH <sub>2</sub> OH) <sub>2</sub> * H <sub>2</sub> SO <sub>4</sub>	10%	+	+	+	+	+	+	+	+	+	+	+	2
Hypochlorous Acid	HOCl	s	+	+	o	+	-	+	+/o	+	+	o	+	(1)
Iodine	I <sub>2</sub>	s	o	-	+	+	-	+	+/o	+	+	o	+/o	
Iron Vitriol => Ferrous Sulphate														
Isobutanol => Isobutyl Alcohol														
Isobutyl Alcohol	C <sub>2</sub> H <sub>5</sub> CH(OH)CH <sub>3</sub>	100%	-	+	+	+	+	+	+	-	o	+	+	1
Isopropanol => Isopropyl Alcohol														
Isopropyl Acetate	CH <sub>3</sub> COOCH(CH <sub>3</sub> ) <sub>2</sub>	100%	-	-	+	+	+	-	+/o	-	+/o	+	+	1
Isopropyl Alcohol	(CH <sub>3</sub> ) <sub>2</sub> CHOH	100%	-	+/o	+	+	+	+	+	-	o	+	+	1
Isopropyl Benzene	C <sub>6</sub> H <sub>5</sub> CH(CH <sub>3</sub> ) <sub>2</sub>	100%	-	-	o	+	+	+	-	-	-	o	+	1
Isopropyl Chloride	CH <sub>3</sub> CHClCH <sub>3</sub>	80%	-	-	o	+	+	+	-	-	o	o	+/o	2
Isopropyl Ether	C <sub>6</sub> H <sub>14</sub> O	100%	-	-	o	+	+	-	-	-	o	o	+	1
Kitchen Salt => Sodium Chloride														
Lactic Acid	C <sub>3</sub> H <sub>6</sub> O <sub>3</sub>	100%	-	+	+	+	+/o	+	10%	-	+/o	+	+	1
Lead Acetate	Pb(CH <sub>3</sub> COO) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Lead Nitrate	Pb(NO <sub>3</sub> ) <sub>2</sub>	50%	+	+	+	+	+	+	+	+	+	+	+	2
Lead Sugar => Lead Acetate														
Lead Sulphate	PbSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(2)
Lead Tetraethyl	Pb(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub>	100%	+	+	+	+	+	+	-	n	n	+	+	3
Lime Milk => Calcium Hydroxide														
Liquid Ammonia => Ammonium Hydroxide														
Lithium Bromide	LiBr	s	+	+	+	+	+	+	+	+	+	+	+	1
Lithium Chloride	LiCl	s	+	+	+	+	-	+	+	+	+	+	n	1
Lunar Caustic => Silver Nitrate														
Magnesium Carbonate	MgCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	1
Magnesium Chloride	MgCl <sub>2</sub>	s	+	+	+	+	o	+	+	+	+	+	+	1
Magnesium Hydroxide	Mg(OH) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Magnesium Nitrate	Mg(NO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Magnesium Sulphate	MgSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	1
Maleic Acid	C <sub>4</sub> H <sub>4</sub> O <sub>4</sub>	s	+	+	+	+	+	+	+	-	o	+	+	1
Malic Acid	C <sub>4</sub> H <sub>6</sub> O <sub>5</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Manganese-II-Chloride	MnCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	1
Manganese-II-Sulphate	MnSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
MEK => Methyl Ethyl Ketone														
Mercury	Hg	100%	+	+	+	+	+	+	+	+	+	+	+	3
Mercury-II-Chloride	HgCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	3
Mercury-II-Cyanide	Hg(CN) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Mercury-II-Nitrate	Hg(NO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Mesityl Oxide	C <sub>6</sub> H <sub>10</sub> O	100%	-	-	n	n	+	-	+/o	-	-	n	+	1
Methacrylic Acid	C <sub>3</sub> H <sub>5</sub> COOH	100%	n	n	+	+	+	o	+/o	-	+/o	+	+	1

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Methanol	CH <sub>3</sub> OH	100%	-	-	+	+	+	o	+	-	+/o	+	+	1
Methoxybutanol	CH <sub>3</sub> O(CH <sub>2</sub> ) <sub>4</sub> OH	100%	-	-	+	+	+	+	o	-	o	+	+	(1)
Methyl Acetate	CH <sub>3</sub> COOCH <sub>3</sub>	60%	-	-	+	+	+	-	+/o	-	+/o	+	+	2
Methyl Acrylate	C <sub>2</sub> H <sub>3</sub> COOCH <sub>3</sub>	100%	-	-	+	+	+	-	+/o	-	o	+	+	2
Methyl Benzoate	C <sub>6</sub> H <sub>5</sub> COOCH <sub>3</sub>	100%	-	-	+	o	+	+	-	-	-	+	+	2
Methyl Catechol	C <sub>6</sub> H <sub>3</sub> (OH) <sub>2</sub> CH <sub>3</sub>	s	+	+	+	+	+	+	-	+	+o	+	+	(1)
Methyl Cellulose		s	+	+	+	+	+	+	+	+	+	+	+	1
Methyl Chloroacetate	ClCH <sub>2</sub> COOCH <sub>3</sub>	100%	-	o	+	+	+	o	-	-	-	+	+	2
Methyl Cyclopentane	C <sub>5</sub> H <sub>9</sub> CH <sub>3</sub>	100%	+	+	+	+	+	+	-	-	-	+	+	(1)
Methyl Dichloroacetate	Cl <sub>2</sub> CHCOOCH <sub>3</sub>	100%	-	-	+	n	+	-	n	-	-	+	+	2
Methyl Ethyl Ketone	CH <sub>3</sub> COC <sub>2</sub> H <sub>5</sub>	100%	-	-	+	-	+	-	+	-	-	+	+	1
Methyl Glycol	C <sub>2</sub> H <sub>6</sub> O <sub>2</sub>	100%	+	+	+	+	+	-	+/o	+	+	+	+	1
Methyl Isobutyl Ketone	CH <sub>3</sub> COC <sub>4</sub> H <sub>9</sub>	100%	-	-	+	-	+	-	o	-	-	+	+	1
Methyl Isopropyl Ketone	CH <sub>3</sub> COC <sub>3</sub> H <sub>7</sub>	100%	-	-	+	-	+	-	+/o	-	-	+	+	1
Methyl Methacrylate	C <sub>3</sub> H <sub>5</sub> COOCH <sub>3</sub>	100%	-	-	+	+	+	-	-	-	-	+	+	1
Methyl Oleate	C <sub>17</sub> H <sub>33</sub> COOCH <sub>3</sub>	100%	n	n	+	+	+	+	+/o	n	n	+	+	1
Methyl Salicylate	HOC <sub>6</sub> H <sub>4</sub> COOCH <sub>3</sub>	100%	-	-	+	+	+	n	+/o	-	-	+	+	1
Methylacetyl Acetate	C <sub>5</sub> H <sub>8</sub> O <sub>3</sub>	100%	-	-	+	+	+	-	+/o	-	o	+	+	2
Methylamine	CH <sub>3</sub> NH <sub>2</sub>	32%	+	o	+	o	+	-	+	+	+	+	+	2
Methylene Chloride => Dichloro Methane														
Mirabilit => Sodium Sulphate														
Morpholine	C <sub>4</sub> H <sub>9</sub> ON	100%	-	-	+	-	+	n	n	-	-	+	+	2
Muriatic Acid => Hydrochloric Acid														
Natron => Sodium Bicarbonate														
Nickel-II-Acetate	(CH <sub>3</sub> COO) <sub>2</sub> Ni	s	+	+	+	+	+	-	+	+	+	+	+	(2)
Nickel-II-Chloride	NiCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	+	2
Nickel-II-Nitrate	Ni(NO <sub>3</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	2
Nickel-II-Sulphate	NiSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	2
Nitrate of Lime => Calcium Nitrate														
Nitric Acid	HNO <sub>3</sub>	99%	10%	10%*	50%	65%	50%	65%	10%	35%	35%	50%	65%	1
Nitro Methane	CH <sub>3</sub> NO <sub>2</sub>	100%	-	-	+	o	+	-	+/o	-	-	+	+	2
Nitro Propane	(CH <sub>3</sub> ) <sub>2</sub> CHNO <sub>2</sub>	100%	-	-	+	n	+	-	+/o	-	-	+	+	2
Nitro Toluene	C <sub>6</sub> H <sub>4</sub> NO <sub>2</sub> CH <sub>3</sub>	100%	-	-	+	+	+	o	-	-	-	+	+	2
Octane	C <sub>8</sub> H <sub>18</sub>	100%	o	+	+	+	+	+	-	-	-	+	+	1
Octanol	C <sub>8</sub> H <sub>17</sub> OH	100%	-	-	+	+	+	+	+	-	-	+	+	1
Octyl Cresol	C <sub>15</sub> H <sub>24</sub> O	100%	-	-	+	+	+	o	n	-	-	+	+	(1)
Oil => Engine Oils														
Oleum	H <sub>2</sub> SO <sub>4</sub> + SO <sub>3</sub>	s	n	-	-	-	+	+	-	+	+	-	+	2
Orthophosphoric Acid => Phosphoric Acid														
Oxalic Acid	(COOH) <sub>2</sub>	s	+	+	+	+	10%	+	+	+/o	+/o	+	+/o	1
Pentane	C <sub>5</sub> H <sub>12</sub>	100%	+	+	+	+	+	+	-	-	-	+	+	1
Pentanol => Amyl Alcohol														
Perchloric Acid	HClO <sub>4</sub>	70%	n	10%	10%	+	-	+	+/o	o	+	+	n	1
Perchloroethylene => Tetrachloro Ethylene														
Perhydrol => Hydrogen Peroxide														
Petroleum Ether	C <sub>n</sub> H <sub>2n+2</sub>	100%	+	+/o	+	+	+	+	-	-	-	+	+	1
Phenole	C <sub>6</sub> H <sub>5</sub> OH	100%	-	-	+	+	+	+	-	10%	+	+	+	2
Phenyl Ethyl Ether	C <sub>6</sub> H <sub>5</sub> OC <sub>2</sub> H <sub>5</sub>	100%	-	-	+	n	+	-	-	-	-	+	+	2
Phenyl Hydrazine	C <sub>6</sub> H <sub>5</sub> NHNH <sub>2</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	2
Phosphoric Acid	H <sub>3</sub> PO <sub>4</sub>	85%	50%	+	+	+	+	+	+	+	+	+	+	1
Phosphorous Oxychloride	POCl <sub>3</sub>	100%	-	-	+	+	n	+	+	n	n	+	+	1
Phosphorous Trichloride	PCl <sub>3</sub>	100%	-	-	+	+	+	o	+	+	+/o	+	+	1
Phthalic Acid	C <sub>6</sub> H <sub>4</sub> (COOH) <sub>2</sub>	s	+	+	+	+	+	+	+	-	+	+	+	1
Picric Acid	C <sub>6</sub> H <sub>2</sub> (NO <sub>3</sub> ) <sub>3</sub> OH	s	+	+	+	+	+	+	+	+	-	+	+	2
Piperidine	C <sub>5</sub> H <sub>11</sub> N	100%	-	-	n	n	+	-	-	-	-	n	+	2
Potash Alum => Potassium Aluminium Sulphate														
Potassium Acetate	CH <sub>3</sub> COOH	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Aluminium Sulphate	KAl(SO <sub>4</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Bicarbonate	KHCO <sub>3</sub>	40%	+	+	+	+	+	+	+	+	+	+	+/o	1
Potassium Bifluoride	KHF <sub>2</sub>	s	n	+	+	+	+	+	+	+	+	+	+	1
Potassium Bisulphate	KHSO <sub>4</sub>	5%	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Bitartrate	KC <sub>4</sub> H <sub>5</sub> O <sub>6</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Borate	KBO <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	(1)
Potassium Bromate	KBrO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Potassium Bromide	KBr	s	+	+	+	+	10%	+	+	+	+	+	0,1	1
Potassium Carbonate	K <sub>2</sub> CO <sub>3</sub>	s	+	+	+	+	+	+	+	55%	55%	+	+	1
Potassium Chlorate	KClO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Potassium Chloride	KCl	s	+	+	+	+	-	+	+	+	+	+	+/o	1
Potassium Chromate	K <sub>2</sub> CrO <sub>4</sub>	10%	+	+	+	+	+	+	+	+	+	+	+	3

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Potassium Chrome Sulphate	KCr(SO <sub>4</sub> ) <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Cyanate	KOCN	s	+	+	+	+	+	+	+	+	+	+	+	2
Potassium Cyanide	KCN	s	+	+	+	+	5%	+	+	+	+	+	5%	3
Potassium Cyanoferrate II	K <sub>4</sub> Fe(CN) <sub>6</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Cyanoferrate III	K <sub>3</sub> Fe(CN) <sub>6</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Dichromate	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	s	+	+	+	+	25%	+	+	+	+	+	10%	3
Potassium Fluoride	KF	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Hydroxyde	KOH	50%	+	+	+	-	+	-	+	10%	10%	+	+	1
Potassium Iodide	KI	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Nitrate	KNO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Perchlorate	KClO <sub>4</sub>	s	+	+	+	+	n	+	+	+	+	+	+	1
Potassium Permanganate	KMnO <sub>4</sub>	s	+	+	+	+	+	+	+	6%	6%	+	+	2
Potassium Persulphate	K <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Phosphate	KH <sub>2</sub> PO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Pyrochromate => Potassium Dichromate														
Potassium Sulphate	K <sub>2</sub> SO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Potassium Sulphite	K <sub>2</sub> SO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Propionic Acid	C <sub>2</sub> H <sub>5</sub> COOH	100%	o	+	+	+	+	+	+	-	+/o	+	+	1
Propionitrile	CH <sub>3</sub> CH <sub>2</sub> CN	100%	n	n	+	+	+	+	-	-	-	+	+	2
Propyl Acetate	CH <sub>3</sub> COOC <sub>3</sub> H <sub>7</sub>	100%	-	-	+	+	+	-	+/o	-	-	+	+	1
Propylene Glycol	CH <sub>3</sub> CHOHCH <sub>2</sub> OH	100%	+	+	+	+	+	+	+	+	+	+	+	1
Prussic Acid => Hydrogen Cyanide														
Pyridine	C <sub>5</sub> H <sub>5</sub> N	100%	-	-	o	-	+	-	-	-	o	+	+	2
Pyrrrole	C <sub>4</sub> H <sub>4</sub> NH	100%	n	n	+	n	+	-	-	-	-	+	+	2
Roman Vitriol => Copper Sulphate														
Salicylic Acid	HOC <sub>6</sub> H <sub>4</sub> COOH	s	+	+	+	+	+	+	+	+	+	+	+/o	1
Salmiac => Ammonium Chloride														
Saltpeter => Potassium Nitrate														
Silic Acid	SiO <sub>2</sub> * x H <sub>2</sub> O	s	+	+	+	+	+	+	+	+	+	+	+	1
Silver Bromide	AgBr	s	+	+	+	+	+/o	+	+	+	+	+	+	1
Silver Chloride	AgCl	s	+	+	+	+	-	+	+	+	+	+	+/o	1
Silver Nitrate	AgNO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	3
Slaked Lime => Calcium Hydroxide														
Soda => Sodium Carbonate														
Sodium Acetate	NaCH <sub>3</sub> COO	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Benzoate	C <sub>6</sub> H <sub>5</sub> COONa	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Bicarbonate	NaHCO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Bisulphate	NaHSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Bisulphite	NaHSO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Borate	NaBO <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Bromate	NaBrO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Sodium Bromide	NaBr	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Carbonate	Na <sub>2</sub> CO <sub>3</sub>	s	+	+	+	+	+/o	+	+	+	+	+	+	1
Sodium Chlorate	NaClO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Sodium Chloride	NaCl	s	+	+	+	+	-	+	+	+	+	+	+	1
Sodium Chlorite	NaClO <sub>2</sub>	24%	+	+	+	+	10%	+	+	+	+	+	10%	2
Sodium Chromate	Na <sub>2</sub> CrO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Sodium Cyanide	NaCN	s	+	+	+	+	+	+	+	+	+	+	+	3
Sodium Dichromate	Na <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	s	+	+	+	+	+	+	+	+	+	+	+	3
Sodium Dithionite	Na <sub>2</sub> S <sub>2</sub> O <sub>4</sub>	s	+	10%	10%	+	+	n	n	+	+	10%	+/o	1
Sodium Fluoride	NaF	s	+	+	+	+	10%	+	+	+	+	+	+	1
Sodium Hydrogen Sulphate => Sodium Bisulphate														
Sodium Hydroxide	NaOH	45% (25 °C)	+	+	+	+	+	-	+	10%	30%	+	+	1
Sodium Hypochlorite	NaOCl + NaCl	12%	+	+	o	+	-	+	+	+	+	o	> 10%	2
Sodium Iodide	NaI	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Metaphosphate	(NaPO <sub>3</sub> ) <sub>n</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Nitrate	NaNO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Nitrite	NaNO <sub>2</sub>	s	+	+	+	+	+	+	+	+	+	+	+	2
Sodium Oxalate	Na <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Perborate	NaBO <sub>2</sub> *H <sub>2</sub> O <sub>2</sub>	s	+	+/o	+	+	+	+	+	+	+	+	+/o	1
Sodium Perchlorate	NaClO <sub>4</sub>	s	+	+	+	+	10%	+	+	+	+	+	10%	1
Sodium Peroxide	Na <sub>2</sub> O <sub>2</sub>	s	+	+	+	+	+	+	+	n	n	-	+	1
Sodium Persulphate	Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	s	n	+	+	+	+	+	+	+	+	+	+	1
Sodium Pyrosulphite	Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>	s	+	+	+	+	+	n	n	+	+	+	+	1
Sodium Salicylate	C <sub>6</sub> H <sub>4</sub> (OH)COONa	s	+	+/o	+	+	+	+	+	+	+	+	+	1
Sodium Silicate	Na <sub>2</sub> SiO <sub>3</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Sulphate	Na <sub>2</sub> SO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Sulphide	Na <sub>2</sub> S	s	+	+	+	+	+	+	+	+	+	+	+	2

# ProMinent® Chemical Resistance List

Chemical	Formula	Conc	Acryl	PVC	PP	PVDF	1.4404	FPM	EPDM	Tygon	Pharmed	PE	HastelloyC	WPC
Sodium Sulphite	Na <sub>2</sub> SO <sub>3</sub>	s	+	+	+	+	50%	+	+	+	+	+	50%	1
Sodium Tetraborate	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> * 10 H <sub>2</sub> O	s	+	+	+	+	+	+	+	+	+	+	+	1
Sodium Thiosulphate	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	s	+	+	+	+	25%	+	+	+	+	+	25%	1
Sodium Tripolyphosphate	Na <sub>5</sub> P <sub>3</sub> O <sub>10</sub>	s	+	+	+	+	+	+/o	+	+	+	+	+	1
Starch	(C <sub>6</sub> H <sub>10</sub> O <sub>5</sub> ) <sub>n</sub>	s	+	+	+	+	+	+	n	+	+	+	+	1
Starch Gum		s	+	+	+	+	+	+	+	+	+	+	+	1
Styrene	C <sub>6</sub> H <sub>5</sub> CHCH <sub>2</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	2
Sublimate => Mercury-II-Chloride														
Succinic Acid	C <sub>4</sub> H <sub>6</sub> O <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Sugar Syrup		s	+	+	+	+	+	+	+	+	+	+	+	1
Sulphur Chloride => Disulphur Dichloride														
Sulphuric Acid	H <sub>2</sub> SO <sub>4</sub>	98%	30%	50%	85%	+	20%	+	+	30%	30%	80%	+	1
Sulphuric Acid, fuming --> Oleum														
Sulphurous Acid	H <sub>2</sub> SO <sub>3</sub>	s	+	+	+	+	10%	+	+	+	+	+	+	(1)
Sulphuryl Chloride	SO <sub>2</sub> Cl <sub>2</sub>	100%	-	-	-	o	n	+	o	-	-	-	n	1
Tannic Acid	C <sub>76</sub> H <sub>52</sub> O <sub>46</sub>	50%	+	+	+	+	+	+	+	+	+	+	+	1
Tartaric Acid	C <sub>4</sub> H <sub>6</sub> O <sub>6</sub>	s	50%	+	+	+	+	+	+/o	+	+	+	+	1
Tetrachloro Ethane	C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub>	100%	-	-	o	+	+	o	-	-	o	o	+	3
Tetrachloro Ethylene	C <sub>2</sub> Cl <sub>4</sub>	100%	-	-	o	+	+	o	-	-	o	o	+	3
Tetrachloromethane => Carbon Tetrachloride														
Tetrahydro Furane	C <sub>4</sub> H <sub>8</sub> O	100%	-	-	o	-	+	-	-	-	-	o	+	1
Tetrahydro Naphthalene	C <sub>10</sub> H <sub>12</sub>	100%	-	-	-	+	+	+	-	-	-	o	+	3
Tetralin => Tetrahydro Naphthalene														
THF => Tetrahydrofurane														
Thionyl Chloride	SOCl <sub>2</sub>	100%	-	-	-	+	n	+	+	+	+	-	n	1
Thiophene	C <sub>4</sub> H <sub>4</sub> S	100%	n	-	o	n	+	-	-	-	-	o	+	3
Tin-II-Chloride	SnCl <sub>2</sub>	s	+	o	+	+	-	+	+	+	+	+	+/o	1
Tin-II-Sulphate	SnSO <sub>4</sub>	s	n	+	+	+	+	+	+	+	+	+	+/o	(1)
Tin-IV-Chloride	SnCl <sub>4</sub>	s	n	+	+	+	-	+	+	+	+	+	+	1
Titanium Tetrachloride	TiCl <sub>4</sub>	100%	n	n	n	+	n	o	-	n	n	n	n	1
Toluene	C <sub>6</sub> H <sub>5</sub> CH <sub>3</sub>	100%	-	-	o	+	+	o	-	-	-	o	+	2
Toluene Diisocyanate	C <sub>7</sub> H <sub>3</sub> (NCO) <sub>2</sub>	100%	n	n	+	+	+	-	+/o	n	n	+	+	2
Tributyl Phosphate	(C <sub>4</sub> H <sub>9</sub> ) <sub>3</sub> PO <sub>4</sub>	100%	n	-	+	+	+	-	+	o	+	+	+	1
Trichloro Ethane	CCl <sub>3</sub> CH <sub>3</sub>	100%	-	-	o	+	+	+	-	-	o	o	+	3
Trichloro Ethylene	C <sub>2</sub> HCl <sub>3</sub>	100%	-	-	o	+	+/o	o	-	-	o	o	+	3
Trichloro Methane => Chloroform														
Trichloroacetaldehyde Hydrate	CCl <sub>3</sub> CH(OH) <sub>2</sub>	s	-	-	o	-	+	o	o	n	n	+	+	2
Trichloroacetic Acid	CCl <sub>3</sub> COOH	50%	-	+	+	+	-	-	o	+	+/o	+	+	1
Tricresyl Phosphate	(C <sub>7</sub> H <sub>7</sub> ) <sub>3</sub> PO <sub>4</sub>	90%	-	-	+	n	+	o	+	o	+	+	+	2
Triethanol Amine	N(C <sub>2</sub> H <sub>4</sub> OH) <sub>3</sub>	100%	+	o	+	n	+	-	+/o	-	o	+	+	1
Trilene => Trichloro Ethane														
Trioctyl Phosphate	(C <sub>8</sub> H <sub>17</sub> ) <sub>3</sub> PO <sub>4</sub>	100%	n	-	+	+	+	o	+	o	+	+	+	2
Trisodium Phosphate	Na <sub>3</sub> PO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+	1
Urea	CO(NH <sub>2</sub> ) <sub>2</sub>	s	+	+/o	+	+	+	+	+	20%	20%	+	+	1
Vinyl Acetate	CH <sub>2</sub> =CHOOCCH <sub>3</sub>	100%	-	-	+	+	+	n	n	-	+/o	+	+	2
Water Glass => Sodium Silicate														
Xylene	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	100%	-	-	-	+	+	o	-	-	-	o	+	2
Zinc Acetate	(CH <sub>3</sub> COO) <sub>2</sub> Zn	s	+	+	+	+	+	-	+	+	+	+	+	1
Zinc Chloride	ZnCl <sub>2</sub>	s	+	+	+	+	-	+	+	+	+	+	n	1
Zinc Sulphate	ZnSO <sub>4</sub>	s	+	+	+	+	+	+	+	+	+	+	+/o	1

# ProMinent® Chemical Resistance List

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## 5 Tanks And Transfer Pumps

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## 5.0 Overview Of Tanks And Transfer Pumps

### 5.0.1

### Product Overview

#### Tanks

##### Dosing Tanks and Bunds

Effective capacity from 35 to 1000 litres.

Tanks and bunds made from PE available in matching sizes and different colours.



pk\_3\_052

##### Storage Tanks

Effective capacity from 500 litres up to 15 m<sup>3</sup>.

Both standardised and customised polyethylene storage tanks and drip trays, also available with general WHG approval.



pk\_3\_053

#### Transfer Pumps

##### Spectra Progressive Cavity Pump

Output range 0.1 – 12,000 l/h, 12 – 3 bar.

Progressive cavity pump for conveying liquid polyelectrolytes in concentrated and diluted form.

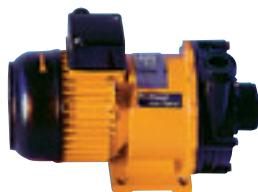


pk\_3\_054

##### von Taine® Magnetically Coupled Centrifugal Pump

Output range up to 22,500 l/h, delivery head up to 23.5 m water column

Centrifugal pump with magnetic clutch for conveying liquid media. Leak-free transfer from tank to tank. Not self-priming, infeed necessary.



pk\_3\_055

##### Duodos Air Operated Diaphragm Pump

Output range: up to 6,700 l/h, 7 bar

Compressed air operated diaphragm pump for conveying liquid media. Run-dry safe and self-priming, no electrical components.



pk\_3\_056

##### DULCO®Trans Barrel Pump

Output range: 900 l/h, 2,400 l/h, 3,000 l/h

Barrel pump for filling, discharging and refilling liquids from canisters, drums and containers.



pk\_3\_057

## 5.0 Overview Of Tanks And Transfer Pumps

### 5.0.2 Selection Guide

#### Selection Guide - Tanks:

	Shape	WHG approval	Effective volume
Dosing Tanks PE	Cylindrical		35 - 1,000 l
PE Storage Tank With General WHG Approval	Cylindrical	x	500 - 25,000 l
PP/PE Storage Tanks, Custom-Built	Cylindrical or rectangular		500 - 25,000 l

#### Selection Guide - Transfer Pumps:

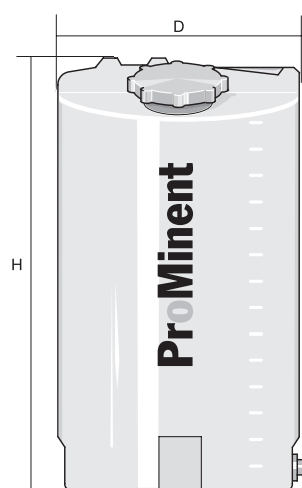
Pump type	Priming	Drive	Output range
Spectra progressive cavity pump	Self-priming	Electric	0.1 - 12,000 l/h
von Taine® magnetically coupled centrifugal pump	Normal-priming (infeed necessary)	Electric	Up to 22,500 l/h
Duodos air operated diaphragm pump	Self-priming	Compressed air	Up to 6,700 l/h
DULCO® Trans barrel pump	Self-priming	Electric	900 - 3,000 l/h

## 5.1 Dosing Tanks And Bunds PE

### 5.1.1 Dosing Tanks PE

Made of UV-stabilised polyethylene with scale for litres and US gallons and screw cap (35 l drum with push cap) integral sintered threaded bushes for the assembly of ProMinent® electronic metering pumps, mounting flange with integral sintered threaded bushes for manual or electric stirrers. All tanks designed for extreme robustness with ProMinent® logo and 3 lateral flats for mounting drum.

#### Natural coloured/transparent PE dosing tank



pk\_3\_0001\_1a

Usable capacity l	D mm	H mm	Threaded bush for the dosing pumps	Weight empty kg	Order no.
35	350	485	without threaded bushes	3.5	791993
60	410	590	gamma/ L, D_4a	5.0	791994
100	500	760	alpha, Beta®, gamma/ L, D_4a	7.0	1001490
140	500	860	gamma/ L, D_4a	9.5	791995
250	650	1,100	alpha, Beta®, gamma/ L, D_4a, Sigma/ 1/ 2/ 3, delta®	17.5	1023175
500	820	1,190	2 x gamma/ L, 2 x D_4a, 2 x Sigma/ 1, delta®	24.5	791997
1,000	1,070	1,260	2 x gamma/ L, 2 x D_4a, 2 x Sigma/ 1/ 2/ 3, delta®	51.0	1010909

#### Natural coloured/transparent PE dosing tank

prepared for the installation of a hand operated or electronic stirrer.

Usable capacity l	with an opening for	Order no.
60	A hand operated stirrer	792104
60	An electric stirrer	792105
100	A hand operated stirrer	1002034
100	An electric stirrer	1002033
140	A hand operated stirrer	792106
140	An electric stirrer	792107
250	A hand operated stirrer	792108
250	An electric stirrer	792109
500	A hand operated stirrer	792110
500	An electric stirrer	792111
1,000	A hand operated stirrer	1010910
1,000	An electric stirrer	1010911

A threaded socket R 3/4" is cast into the tanks of 35-1,000 litres for emptying purposes, which can be drilled out to a Ø of 10 mm should the customer require this. A sealing plug made out of PE R 3/4" fitted with a seal can be screwed in (accessory order number 200692).

**Metering tanks without ProMinent® logo are available on request.**

## 5.1 Dosing Tanks And Bunds PE

Made of UV-stabilised polyethylene with scale for litres and US gallons and screw cap (35 l drum with push cap) integral sintered threaded bushes for the assembly of ProMinent® electronic metering pumps, mounting flange with integral sintered threaded bushes for manual or electric stirrers. All tanks designed for extreme robustness with ProMinent® logo and 3 lateral flats for mounting drum.



pk\_3\_001\_1

### Black PE dosing tank

For light sensitive media.

Usable capacity l	Order no.
35	791998
60	791999
100	1001322
140	792000
250	1023176
500	792002
1,000	1010912

### Blue PE dosing tank

Usable capacity l	Order no.
35	1003812
60	1003813
100	1003814
140	1003815
250	1023177
500	1003817
1,000	1010913

### Yellow PE dosing tank

Usable capacity l	Order no.
35	1003818
60	1003819
100	1003820
140	1003821
250	1023178
500	1003823
1,000	1010914

### Red PE dosing tank

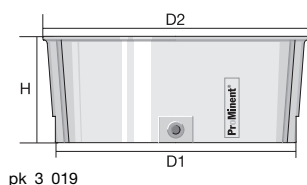
Usable capacity l	Order no.
35	1003824
60	1003825
100	1003826
140	1003827
250	1023179
500	1003829
1,000	1010915

Metering tanks without ProMinent® logo are available on request.

## 5.1 Dosing Tanks And Bunds PE

### 5.1.2 Stackable Bunds For Dosing Tanks PE

Made of UV stabilised polyethylene, stackable, with ProMinent® logo. Incorporating 2 lateral flats for mounting bund.



#### PE colourless/transparent stackable bunds

Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
35	PE	565	507	220	1010879
60	PE	680	607	270	1010880
100	PE	802	727	320	1010881
140	PE	811	727	370	1010882
250	PE	917	807	520	1010883
500	PE	1,155	1,009	670	1010884

#### PE black stackable bunds

Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
35	PE	565	507	220	1010885
60	PE	680	607	270	1010886
100	PE	802	727	320	1010887
140	PE	811	727	370	1010888
250	PE	917	807	520	1010889
500	PE	1,155	1,009	670	1010890

#### PE blue stackable bunds

Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
35	PE	565	507	220	1010891
60	PE	680	607	270	1010892
100	PE	802	727	320	1010893
140	PE	811	727	370	1010894
250	PE	917	807	520	1010895
500	PE	1,155	1,009	670	1010896

#### PE yellow stackable bunds

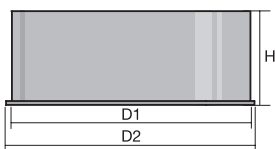
Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
35	PE	565	507	220	1010897
60	PE	680	607	270	1010898
100	PE	802	727	320	1010899
140	PE	811	727	370	1010900
250	PE	917	807	520	1010901
500	PE	1,155	1,009	670	1010902

## 5.1 Dosing Tanks And Bunds PE

### PE red stackable bunds

Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
35	PE	565	507	220	1010903
60	PE	680	607	270	1010904
100	PE	802	727	320	1010905
140	PE	811	727	370	1010906
250	PE	917	807	520	1010907
500	PE	1,155	1,009	670	1010908

For discharge purposes, an R 3/4" threaded socket is already moulded on to the 35-500 l drip trays. The customer can drill out the threaded socket to 10 mm Ø if necessary. A sealing plug made out of PE R 3/4" fitted with a seal can be screwed in (accessory order number 200692).



pk\_3\_018a

### PE natural and black bunds

Usable capacity l	Material	D2 mm	D1 mm	H mm	Order no.
1,000	PE-black	1,280	1,200	980	740726
1,000	PE-natural	1,280	1,200	980	740719

### 5.1.3 Spare Part Kits

	Order no.
Push cap for 35 l tank	740708
Screw cap with seals for 60/100/140/250	740715
Screw cap with seals for 500/1000	740718
Sealing plugs with 3/4" seals PE	200692

## 5.2 Accessories For Dosing Tanks

### 5.2.1 Fittings And Detachable Parts

#### Attachment of pumps to dosing tanks

##### PP mounting plate

for mounting metering pumps onto dosing tanks (including screws for attachment of mounting plates to the dosing tank).



pk\_3\_003

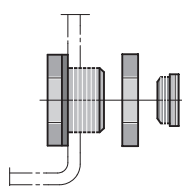
	Order no.
Mounting plate, Sigma/ 1/ 2/ 3	740476
Mounting plate, alpha	790850
Mounting plate, Sigma/ 1, EXtronic®	801569
Mounting plate, EXtronic®	801573
Mounting plate, Beta®, gamma/ L, D_4a	801575
Mounting plate, 3 x gamma/ L, 3 x Beta®	801580
Mounting plate, 2 x gamma/ L, 2 x Beta®	801583

The order no. for the mounting plates can be found in the table below.

Metering pumps	Dosing tank						
	35 l	60 l	100 l	140 l	250 l	500 l	1000 l
alpha	790850	790850	x	790850	x	790850	790850
Beta®	801575	x	x	x	x	2x	2x
gamma/ L	801575	x	x	x	x	2x	2x
D_4a	801575	x	x	x	x	2x	2x
EXtronic®	-	801569	801569	801569	801573	801573	801569
Sigma/ 1	-	801569	740476	740476	x	2x	2x
Sigma/ 2	-	-	-	-	x	740476	2x
Sigma/ 3	-	-	-	-	x	740476	2x
2 x Beta® or 2 x gamma/ L	-	801583	801583	801583	801583	2x801583	2x801583
3 x Beta® or 3x gamma/ L	-	-	801580	801580	801580	2x801580	2x801580

- x = Pump mounted directly onto a tank
- 2x = 2 pumps mounted directly onto a tank (only 500 and 1000 litre)
- - = pump cannot be installed onto the tank

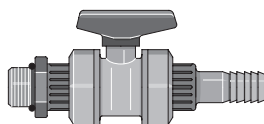
#### Tank connectors with PE plugs



pk\_3\_004

	Order no.
R 3/4" as an additional connection for dosing tanks PE 35-1000 l	809756
R 1/2" as an additional connection for dosing tanks PE 35-1000 l	809755

#### PP discharge tap



pk\_3\_005

	Order no.
For dosing tanks with d 20, Ø 20 mm hose nozzle and 3/4" nipple for direct connection to the threaded connector on the tank.	809714

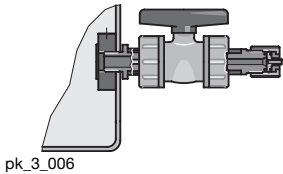
#### PVC discharge tap

	Order no.
For dosing tanks with d 16, Ø 16 mm hose nozzle and 3/4" nipple for direct connection to the threaded connector on the tank	809745

## 5.2 Accessories For Dosing Tanks

### Screw cap lock

	Order no.
Lock with key for screw cap	200683



### PP Tank connector with strainer

A laboratory ball tap and hose connector made of PP for connecting the dosing pump at the base of the dosing tank.

A hole with a  $\varnothing$  of 17 mm is required on the construction side.

Material	o $\varnothing$ x i $\varnothing$ mm	Order no.
PP	6 x 4	809947
PP	8 x 5	809948
PP	10 x 4	1002933
PP	12 x 9	809949
PP	12 x 6	809950

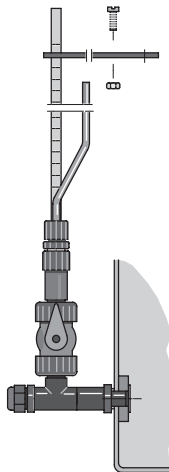
### PVC Tank connector with strainer

Material	o $\varnothing$ x i $\varnothing$ mm	Order no.
PVC	6 x 4	814566
PVC	8 x 5	814567
PVC	10 x 4	1002934
PVC	12 x 9	814568
PVC	12 x 6	814569

### PVC Calibration assembly

For checking the dosing volumes and indicating the liquid level; with a graduated measuring tube having 1 ml graduations, a foot valve, a multi-way valve and the necessary fittings. (Specific information should be given when ordering when there are differing hose and tank sizes).

Suction pipe $\varnothing$ mm	Tank contents Litres	Order no.
6	35, 60	914740
8	60	914741
8	100, 140	914742
12	250	914743
12	500, 1,000	914744



pk\_1\_091

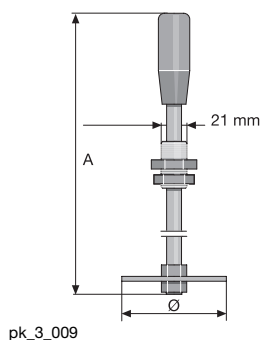


## 5.2 Accessories For Dosing Tanks

### 5.2.2 Stirrers

#### PP Hand mixer

completely assembled.

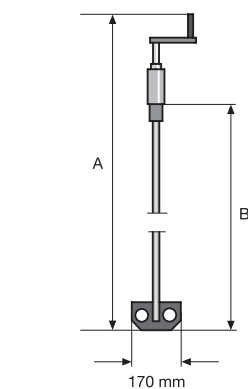


pk\_3\_009

	A mm	Ø mm	Order no.
for tanks 35 and 60 l	515	90	741118
for tanks 100 and 140 l	715	90	741119
for tanks 250 and 500 l	1,040	130	741120

#### PP Hand stirrer

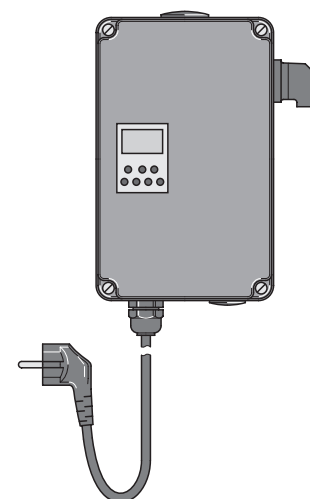
with crank, completely assembled



pk\_3\_007

	A mm	B mm	Order no.
for tank 60 l	670	465	914701
for tank 100 l	855	650	914738
for tank 140 l	965	765	914702
for tank 250 and 500 l	1,175	965	914703
for tank 1000 l	1,240	1,040	914705

#### Timer with digital clock



pk\_3\_010\_1

	Order no.
In plastic housing for the control of a stirrer or a metering pump, 230 V, 50 Hz, max. 6A, IP 65. Day and week programs, shortest switching time 1 min. with 2 m power cable and euro plug.	1005561

Agitators are to be operated only via the motor protection switch!

## 5.2 Accessories For Dosing Tanks

### Stainless steel electric stirrer

For batching and mixing of liquids of up to max. 500 mPas viscosity. Intermittent operation via time switch clock recommended.

Wide range voltage motor with 1400 rpm, insulation class F, suitable for tropic, stainless steel 1.4571 shaft, polypropylene (PP) turbine or PVDF for 1000 l.

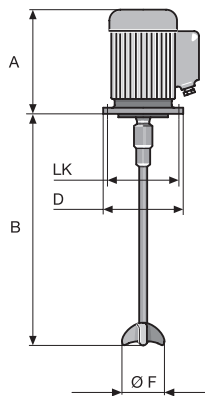
The 0.02-0.25 kW motors run on a single-phase 230 V/50-60 Hz AC supply.

The 0.75 kW motor runs on a three-phase 380-415 V/50-60 Hz AC supply.

A motor safety switch is to be fitted on site for all motors.

Not suitable for gas-emitting media.

	El. connection	Enclosure rating	Order no.
<b>for tank 60 l</b>	20 W/230 V/0.38 A	IP55	818576
<b>for tank 100 l</b>	180 W/230 V/1.40 A	IP55	1001566
<b>for tank 140 l</b>	180 W/230 V/1.40 A	IP55	791502
<b>for tank 250 l</b>	180 W/230 V/1.40 A	IP55	791503
<b>for tank 500 l</b>	250 W/230 V/1.80 A	IP55	791504
<b>for tank 1000 l</b>	750 W/400 V/2.00 A	IP55	791458



pk\_3\_008

Size	A	B	Ø D	Ø LK	Ø F
60	195	490	115	100	70
100	200	675	160	130	70
140	200	780	160	130	70
250	200	950	160	130	70
500	200	950	160	130	70
1000	230	1190	200	165	130

### Chemical resistant electric stirrer

Extended range motor, speed 1400 rpm, insulation class F, insulated for tropics, stainless steel shaft with PVDF coating, hard PP agitator blades.

The 0.02-0.25 kW motors run on a single-phase 230 V/50-60 Hz AC supply.

The 0.75 kW motor runs on a three-phase 380-415 V/50-60 Hz AC supply.

A motor safety switch is to be fitted on site for all motors..

Not suitable for gas-emitting media.

	El. connection	Enclosure rating	Order no.
<b>for tank 60 l</b>	20 W/230 V/0.38 A	IP55	818577
<b>for tank 100 l</b>	180 W/230 V/1.40 A	IP55	1002035
<b>for tank 140 l</b>	180 W/230 V/1.40 A	IP55	791454
<b>for tank 250 l</b>	180 W/230 V/1.40 A	IP55	791455
<b>for tank 500 l</b>	250 W/230 V/1.80 A	IP55	791456
<b>for tank 1000 l</b>	750 W/400 V/2.00 A	IP55	791457

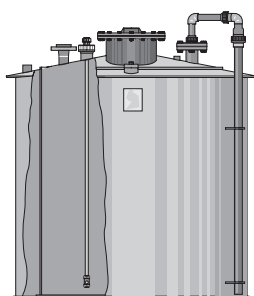
## 5.3 Storage Tanks PP/PE

### 5.3.1 PE/PP Tanks And Apparatus

Plastic tanks are indispensable in today's system technology. That's one reason why we have expanded our product range in terms of welded tanks and apparatus produced from thermoplastics; polyethylene (PE) and polypropylene (PP). These technologically proven materials have high resistance to an extremely wide range of chemicals and can be processed in extremely flexible ways making them ideal for a wide spectrum of applications.

- Waste water technology
- Electroplating
- Storage, including chemicals which cannot come into contact with water
- Exhaust air treatment
- Domestic technology
- Drinking and process water treatment
- Swimming pool technology, etc.

### 5.3.2 PE Storage Tank With General WHG Approval



pk\_3\_014

The storage of chemicals which cannot come into contact with water (Water Hazard Class WGK 0-3) stipulates strict official conditions.

We supply tanks in accordance with German WHG §19 I admission suitable for internal and outdoor locations. The tanks are available complete with monitoring accessories, level control unit, filling facility, heating, discharge and metering facility up to a storage volume of 12 m<sup>3</sup> as standard and up to 25 m<sup>3</sup> on request.

#### Storage tanks PE-HD

- Approval mark Z-40.21-229 in accordance with WHG §19 (Water Resource Management Law)
- Design and manufacture carried out in accordance with the construction and test principles of the DIBT (German Institute of Building Technology)
- For atmospheric pressure operation up to a max. operating temperature of 30 °C
- Material polyethylene PE-HD
- For indoor or outdoor installation
- For chemicals in accordance with DIBT media list

Usable volume 95 % fill level	Internal diameter	External diameter	Height of cylindrical section	Overall height	Weight empty
l	mm	mm	mm	mm	kg
500	800	860	1,050	1,300	50
750	1,000	1,060	1,050	1,300	60
1,000	1,000	1,060	1,350	1,600	70
1,250	1,200	1,260	1,150	1,400	80
1,500	1,200	1,260	1,400	1,650	90
2,000	1,400	1,480	1,400	1,650	100
2,500	1,400	1,480	1,700	1,950	130
3,000	1,600	1,680	1,550	1,800	170
3,500	1,700	1,780	1,550	1,800	190
4,000	1,700	1,780	1,850	2,100	220
5,000	1,900	1,980	1,850	2,100	280
6,000	2,000	2,080	1,950	2,250	350
7,000	2,150	2,250	1,950	2,250	400
8,000	2,150	2,250	2,250	2,550	500
10,000	2,150	2,250	2,900	3,200	600
12,000	2,150	2,250	3,400	3,700	700

Other tank sizes and dimensions and prices available on request.

## 5.3 Storage Tanks PP/PE

### Bunds PE-HD

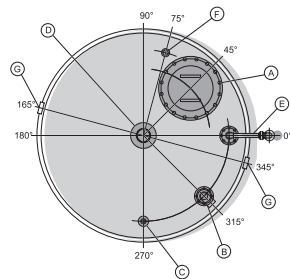
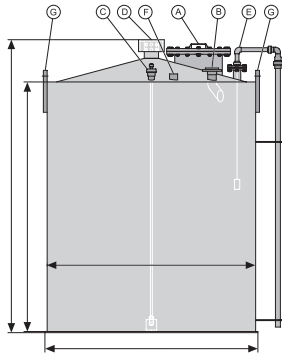
Usable volume 95 % fill level l	Internal diameter mm	External diameter mm	Height of cylindrical section mm	Overall height mm	Weight empty kg
500	1,050	1,150	1,030	1,050	40
750	1,250	1,350	1,030	1,050	45
1,000	1,250	1,350	1,280	1,300	50
1,250	1,450	1,550	1,080	1,100	55
1,500	1,450	1,550	1,330	1,350	60
2,000	1,650	1,750	1,280	1,300	70
2,500	1,650	1,750	1,600	1,620	90
3,000	1,850	1,950	1,470	1,500	105
3,500	1,950	2,050	1,470	1,500	120
4,000	1,950	2,050	1,750	1,780	140
5,000	2,150	2,250	1,750	1,780	160
6,000	2,250	2,350	1,900	1,950	200
7,000	2,390	2,490	1,910	1,960	220
8,000	2,390	2,490	2,200	2,250	270
10,000	2,390	2,490	2,750	2,800	350
12,000	2,390	2,490	3,300	3,350	450

Other tank sizes and dimensions and prices available on request.

## 5.3 Storage Tanks PP/PE

### Standard equipment of our storage tanks and bunds with approval marks

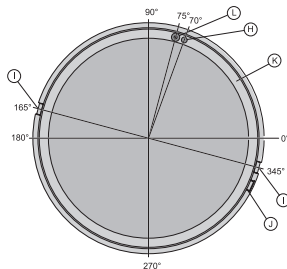
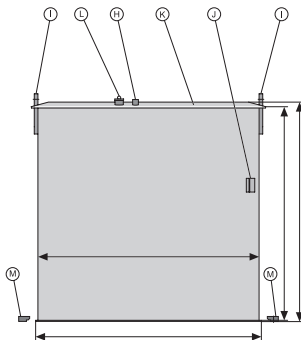
for indoor or outdoor installation; other internal fittings/accessories on request.



pk\_3\_046

Item	Quantity	Name	500 l - 1,250 l	1,500 l - 2,000 l	2,500 l - 3,500 l	4,000 l - 12,000 l
A	1	Handhole/manhole, bolted 1.4301	DN 250	DN 250	DN 500	DN 500
B	1	Filling connection with 45° inlet elbow	DN 32	DN 50	DN 50	DN 50
C	1	Sampling pipe PVC/EPDM	DN 15	DN 15	DN 15	DN 20
D	1	Vent pipe with dome	DN 80	DN 100	DN 100	DN 100
E	1	Cable-operated level indicator	DN 80/40	DN 80/40	DN 80/40	DN 80/40
F	1	Screwed socket for overflow protection	Rp 2"	Rp 2"	Rp 2"	Rp 2"
G	2	Crane lifting eye	-	yes	yes	yes

### Bunds for external installation



pk\_3\_047

Item	Quantity	Name	500 l - 1,250 l	1,500 l - 12,000 l
H	1	Leakage probe support	Rp 2"	Rp 2"
I	2	Crane lifting eye	-	yes
J	1	Rating plate	yes	yes
K	1	Rain collar	yes	yes
L	1	Inspection port	yes	yes
M	1	Floor claw set	yes	yes

### Bunds for installation

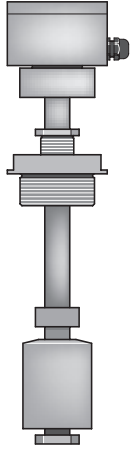
Item	Quantity	Name	500 l - 1,250 l	1,500 l - 12,000 l
H	1	Leakage probe support	Rp 2"	Rp 2"
I	2	Crane lifting eye	-	yes
J	1	Rating plate	yes	yes

## 5.3 Storage Tanks PP/PE

### Accessories Meeting The Requirements Of WHG § 19 and VAWS (Directive On Systems For Storage And Handling Of Water-Endangering Substances)

#### Overfill protection with approval mark

Level detector T200 with float as max. level limit switch, without downstream transmitter, see below. Length 500 mm.



pk\_3\_037

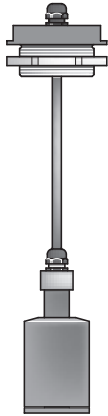
Order no.

Overfill protection with approval mark

1009334

#### Leakage probe with approval mark

Leakage detection system T200 consisting of level detector with float, without downstream transmitter, see below. Length 3,000 mm.



pk\_3\_038

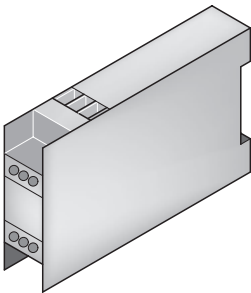
Order no.

Leakage probe with approval mark

1009340

#### Transmitter with approval mark

For installation in control cabinets by others, suitable for leakage and overfill protection.



pk\_3\_040

Order no.

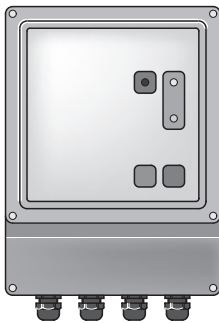
Transmitter with approval mark

1009348

#### Alarm indicator unit

For overfill protection and leakage probe with approval mark, complete with signal horn and two transmitters.

Price on request.



pk\_3\_039

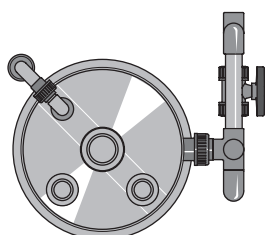
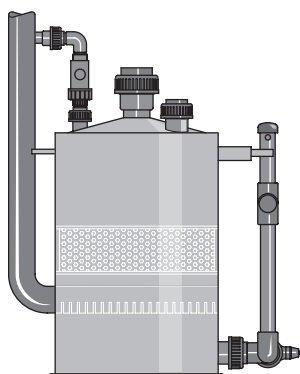
## 5.3 Storage Tanks PP/PE

### Absorption vessel

For ventilation of sealed storage tanks.

Material: polyethylene PE-HD complete with connections, ball valve PVC/EPDM and fixed pipework to storage tank; sizes and prices according to tank volume and stored medium.

Price on request.



pk\_3\_041

### Acid vapour separator

Size and combining agent according to tank volume and stored medium.

Price on request.

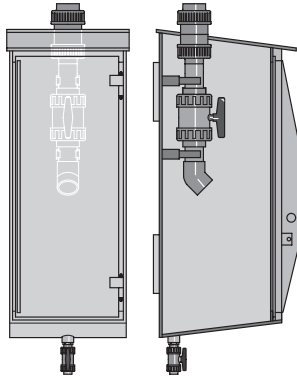


pk\_3\_042

## 5.3 Storage Tanks PP/PE

### Other Accessories

#### Chemical filling station



pk\_3\_043

Suitable for third-party wall mounting.

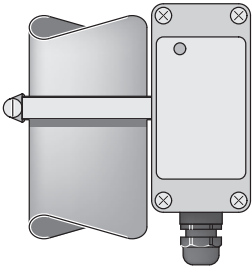
Material: polyethylene PE-HD.

Size: approx. 420x420x1000 mm (LxWxH), complete with ball valve DN 50 PVC/EPDM, threaded connector DN 50 and drip tray with ball valve DN 25

PVC/EPDM connection: Rp 20 (parallel female thread)

Other internal fittings such as tanker couplings, automatic valves, heating, etc. are possible; prices on request.

#### Bistable changeover contact

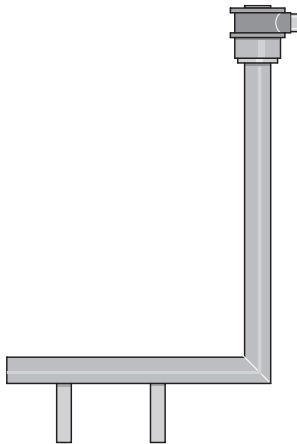


pk\_3\_044

With approval mark for fitting on cable-operated level indicator.

	<b>Order no.</b>
<b>Bistable changeover contact</b>	1009349

#### Storage tank heating



pk\_3\_045

With temperature and level control for run-dry protection; on request, according to stored medium and tank volume.

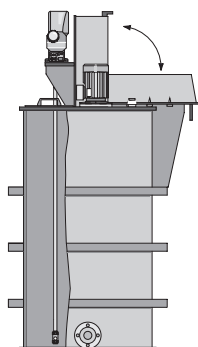
Optional in addition to insulation of the storage tank.

Price on request.



## 5.3 Storage Tanks PP/PE

### 5.3.3 PP/PE Storage Tanks, Custom-Built



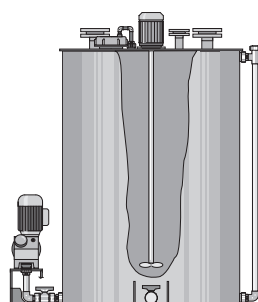
pk\_3\_015

Very often, space considerations or system requirements prevent the use of conventional dosing containers.

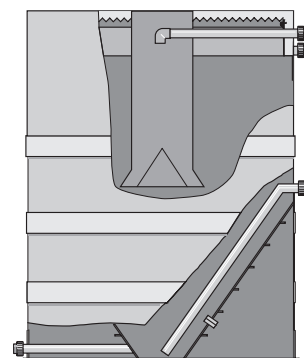
In many cases space constraints or system-specific requirements prevent the use of ready-made dosing containers.

With welded PE/PP tanks we can solve this problem. A tank can be optimally adapted to your specific requirements.

In addition, system installations and appliances such as salt-dissolving baskets, sack-pouring equipment, adsorption containers, angled and hopper bases can be added to improve or enhance the tank functions.



pk\_3\_016



pk\_3\_017

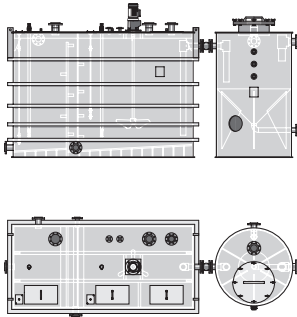
#### Circular tanks

- Material polyethylene PE-HD or polypropylene PP
- Base design, flat base, tapered base, sloping base
- Roof design, flat roof, tapered roof or open, suitable for atmospheric pressure operation at operating temperatures up to 80 °C
- Standard equipment: 2 crane lifting eyes on circular tanks with usable volumes above 2000 litres
- Prices on request according to application

Usable volume 95 % fill level	Internal diameter	External diameter	Height of cylindrical section	Overall height
l	mm	mm	mm	mm
500	800	860	1,050	1,070
750	1,000	1,060	1,050	1,070
1,000	1,000	1,060	1,350	1,370
1,250	1,200	1,260	1,150	1,170
1,500	1,200	1,260	1,400	1,425
2,000	1,400	1,480	1,400	1,425
2,500	1,400	1,480	1,700	1,730
3,000	1,600	1,680	1,550	1,580
3,500	1,700	1,780	1,550	1,580
4,000	1,700	1,780	1,850	1,880
5,000	1,900	1,980	1,850	1,880
6,000	2,000	2,080	1,950	1,980
7,000	2,150	2,250	1,950	1,990
8,000	2,150	2,250	2,250	2,290
10,000	2,150	2,250	2,900	2,950
12,000	2,150	2,250	3,400	3,450

Other tank sizes up to 25 m<sup>3</sup> and dimensions available on request.

## 5.3 Storage Tanks PP/PE



pk\_3\_048

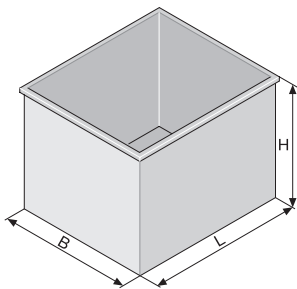
### Rectangular tanks

- Material polyethylene PE-HD or polypropylene PP
- Base design, flat base or sloping base, full-face contact with foundation
- Roof design, flat roof or open, suitable for atmospheric pressure operation at operating temperatures up to 80 °C
- Surrounding steel tube reinforcement, PE or PP coated
- Standard equipment: 4 crane lifting eyes on rectangular tanks with usable volumes above 2000 litres.
- Prices on request according to application

Usable volume 95 % fill level	Internal dimensions (L x W x H) mm	External dimensions (L x W x H) mm
l	mm	mm
500	950 x 750 x 750	1,100 x 900 x 770
750	1,000 x 1,000 x 800	1,150 x 1,150 x 820
1,000	1,000 x 1,000 x 1,060	1,150 x 1,150 x 1,080
1,250	1,250 x 1,000 x 1,060	1,400 x 1,150 x 1,080
1,500	1,500 x 1,000 x 1,060	1,750 x 1,250 x 1,090
2,000	1,500 x 1,250 x 1,130	1,750 x 1,500 x 1,160
2,500	1,750 x 1,250 x 1,210	2,000 x 1,500 x 1,240
3,000	1,750 x 1,250 x 1,450	2,000 x 1,500 x 1,480
3,500	1,750 x 1,500 x 1,410	2,000 x 1,750 x 1,440
4,000	2,000 x 1,500 x 1,410	2,250 x 1,750 x 1,440
5,000	2,500 x 1,500 x 1,410	2,750 x 1,750 x 1,440
6,000	2,500 x 1,750 x 1,450	2,750 x 2,000 x 1,480
7,000	2,500 x 1,750 x 1,700	2,750 x 2,000 x 1,730
8,000	2,500 x 2,000 x 1,700	2,750 x 2,250 x 1,730
10,000	3,000 x 2,000 x 1,760	3,350 x 2,350 x 1,800
12,000	3,500 x 2,000 x 1,810	3,850 x 2,350 x 1,850
15,000	4,000 x 2,000 x 2,000	4,350 x 2,350 x 2,050

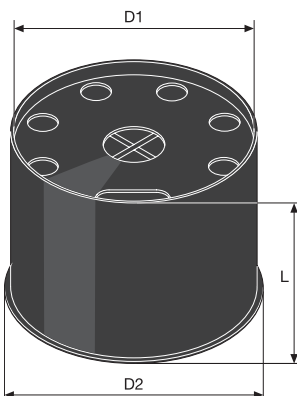
Other tank sizes up to 25 m<sup>3</sup> and dimensions available on request

### 5.3.4 Drip Trays For PE Supply Drums



pk\_3\_021

Usable capacity	Material	External dimensions (L x W x H) mm	Internal dimensions (L x W x H) mm	Order no.
l		mm	mm	
40	PE black	500 x 400 x 266	450 x 350 x 260	791726
70	PE black	500 x 430 x 378	470 x 400 x 370	740309



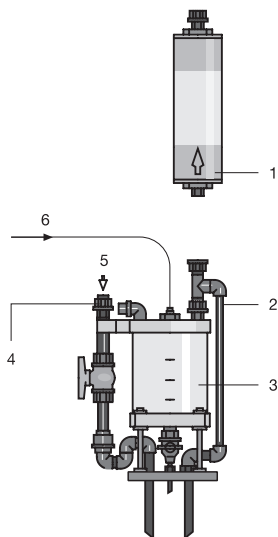
pk\_3\_022

Usable capacity	Material	D2	D1	H	Order no.
l		mm	mm	mm	
250	PE-neutral	840	800	508	791727

## 5.3 Storage Tanks PP/PE

### 5.3.5 PVC Batch Box

For metering solutions of concentrated fluids e. g. hydrazine, ammonia, caustic soda etc. The batch box is designed for attachment to our 140 and 250/500 litre dosing tanks.



pk\_3\_023

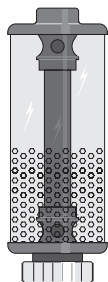
- 1 Activated carbon filter
- 2 Venting line
- 3 Batch box
- 4 Gas displacement tubing
- 5 Water intake
- 6 Fluid concentrate

Batch Box	Usable capacity	Tanks	Order no.
	l		
Disposable drums	2	140 l	1020438
Disposable drums	5	250/500 l	1020441
Reusable drums	2	140 l	1020443
Reusable drums	5	250/500 l	1020455

	Order no.
Activated carbon filter with bracket	1020442

### 5.3.6 Chemical Vapour Lock

Compact chemical vapour lock with screw-attachment for a tank. The chemical vapour lock is filled with the binder Cosa D and is ideal for the storage of aluminium chloride, formic acid, hydrochloric acid, phosphoric acid etc.

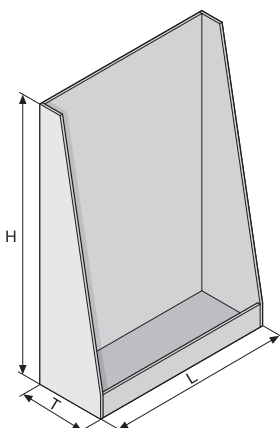


pk\_3\_024

	Usable capacity	Exhaust air, max.	DN	Order no.
	l	l/h		
SDA-90	0.5	1,300	DN 25	1020457
SDA-160	7.0	9,500	DN 65	1020458

### 5.3.7 PP Mounting Rack

with integrated drip tray for mounting metering station.

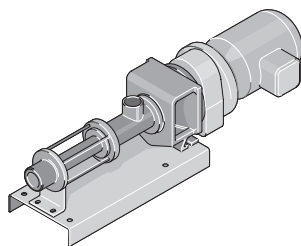


pk\_3\_025

Dimensions H x W x D	Order no.
mm	
1,200 x 800 x 300	1008779
1,200 x 800 x 400	1008780

## 5.4 Spectra Eccentric Screw Pump

### 5.4.1 Spectra: Transfer Pumps For Polymer Solutions



pk\_3\_032

The Spectra eccentric screw pumps were designed for the metering of polymer solutions. Stators in FPM, rotors in stainless steel (Cr Ni Mo 17-12-2) and floating ring seals reduce the maintenance effort and can still be used even if oleiferous polymer solutions are metered.

The pumps are offered in the following types:

- Spectra with manually adjustable gear
- Spectra for frequency converter operation with external fan

#### Spectra with manual gearbox:

without base plate

	Delivery rate at 3 bar	Maximum back pressure bar	Power Uptake kW	Order no.
<b>Spectra 12/2 H</b>	0.6...2.2 l/h	12	0.37	1025244
<b>Spectra 12/13 H</b>	2.4...13.2 l/h	12	0.37	1025245
<b>Spectra 12/30 H</b>	6.5...30.0 l/h	12	0.37	1025246
<b>Spectra 12/105 H</b>	20.0...105.0 l/h	12	0.37	1025247
<b>Spectra 6/300 H</b>	50.0...300.0 l/h	6	0.37	1025248
<b>Spectra 6/600 H</b>	110.0...600.0 l/h	6	0.75	1025249
<b>Spectra 5/1400 H</b>	300.0...1,400.0 l/h	5	0.75	1025250
<b>Spectra 3/3000 H</b>	600.0...3,000.0 l/h	3	1.10	1025251
<b>Spectra 3/6000 H</b>	1,000.0...6,000.0 l/h	3	1.50	1025252
<b>Spectra 3/12000 H</b>	2,000.0...12,000.0 l/h	3	2.20	1025253

with base plate

	Delivery rate at 3 bar	Maximum back pressure bar	Power Uptake kW	Order no.
<b>Spectra 12/2 HB</b>	0.6...2.2 l/h	12	0.37	1025254
<b>Spectra 12/13 HB</b>	2.4...13.2 l/h	12	0.37	1025255
<b>Spectra 12/30 HB</b>	6.5...30.0 l/h	12	0.37	1025256
<b>Spectra 12/105 HB</b>	20.0...105.0 l/h	12	0.37	1025257
<b>Spectra 6/300 HB</b>	50.0...300.0 l/h	6	0.37	1025258
<b>Spectra 6/600 HB</b>	110.0...600.0 l/h	6	0.75	1025259
<b>Spectra 5/1400 HB</b>	300.0...1,400.0 l/h	5	0.75	1025260
<b>Spectra 3/3000 HB</b>	600.0...3,000.0 l/h	3	1.10	1025261
<b>Spectra 3/6000 HB</b>	1,000.0...6,000.0 l/h	3	1.50	1025262
<b>Spectra 3/12000 HB</b>	2,000.0...12,000.0 l/h	3	2.20	1025263

## 5.4 Spectra Eccentric Screw Pump

### Spectra for frequency converter operation with external fan

without base plate

	Delivery rate at 3 bar	Maximum back pressure bar	Power Uptake kW	Order no.
<b>Spectra 12/2 F</b>	0.1...2.4 l/h	12	0.37	1025284
<b>Spectra 12/13 F</b>	0.6...13.2 l/h	12	0.37	1025285
<b>Spectra 12/33 F</b>	2.4...33.0 l/h	12	0.37	1025286
<b>Spectra 12/100 F</b>	5.0...100.0 l/h	12	0.37	1025287
<b>Spectra 6/300 F</b>	20.0...300.0 l/h	6	0.37	1025288
<b>Spectra 6/650 F</b>	40.0...650.0 l/h	6	0.55	1025289
<b>Spectra 5/1400 F</b>	50.0...1,400.0 l/h	5	0.75	1025290
<b>Spectra 3/3000 F</b>	100.0...3,000.0 l/h	3	0.75	1025291
<b>Spectra 3/6500 F</b>	100.0...6,500.0 l/h	3	1.50	1025292
<b>Spectra 3/12000 F</b>	400.0...12,000.0 l/h	3	2.20	1025293

with base plate

	Delivery rate at 3 bar	Maximum back pressure bar	Power Uptake kW	Order no.
<b>Spectra 12/2 FB</b>	0.1...2.4 l/h	12	0.37	1025294
<b>Spectra 12/13 FB</b>	0.6...13.2 l/h	12	0.37	1025295
<b>Spectra 12/33 FB</b>	2.4...33.0 l/h	12	0.37	1025296
<b>Spectra 12/100 FB</b>	5.0...100.0 l/h	12	0.37	1025297
<b>Spectra 6/300 FB</b>	20.0...300.0 l/h	6	0.37	1025298
<b>Spectra 6/650 FB</b>	40.0...650.0 l/h	6	0.55	1025299
<b>Spectra 5/1400 FB</b>	50.0...1,400.0 l/h	5	0.75	1025300
<b>Spectra 3/3000 FB</b>	100.0...3,000.0 l/h	3	0.75	1025301
<b>Spectra 3/6500 FB</b>	100.0...6,500.0 l/h	3	1.50	1025302
<b>Spectra 3/12000 FB</b>	400.0...12,000.0 l/h	3	2.20	1025303

The frequency converters are not included in the standard delivery.

## 5.4 Spectra Eccentric Screw Pump

### Frequency converters for Spectra F:

		recommended for pumps up to	Order no.
SK550/1 FCT	0.55 kW, 1 ph, 230 V, incl. control panel	0.37 kW	1010980
SK750/1 FCT	0.75 kW, 1 ph, 230 V, incl. control panel	0.55 kW	1010981
SK1100/1 FCT	1.10 kW, 1 ph, 230 V, incl. control panel	0.75 kW	1025304
SK1500/1 FCT	1.50 kW, 1 ph, 230 V, incl. control panel	1.10 kW	1010982
SK2200/3 FCT	2.20 kW, 3 ph, 400 V, incl. control panel	2.20 kW	1025305

### 5.4.2

### Spare Parts

	Order no.
Stator FPM for Spectra 12/2	1025306
Stator FPM for Spectra 12/13	1025307
Stator FPM for Spectra 12/30, 12/33	1025308
Stator FPM for Spectra 12/105, 12/100	1025309
Stator FPM for Spectra 6/300	1025310
Stator FPM for Spectra 6/600, 6/650	1025311
Stator FPM for Spectra 5/1400	1025312
Stator FPM for Spectra 3/3000	1025313
Stator FPM for Spectra 3/6000, 3/6500	1025314
Stator FPM for Spectra 3/12000	1025315
Rotor Cr Ni Mo 17-12-2 for Spectra 12/2	1025316
Rotor Cr Ni Mo 17-12-2 for Spectra 12/13	1025317
Rotor Cr Ni Mo 17-12-2 for Spectra 12/30, 12/33	1025318
Rotor Cr Ni Mo 17-12-2 for Spectra 12/105, 12/100	1025319
Rotor Cr Ni Mo 17-12-2 for Spectra 6/300	1025320
Rotor Cr Ni Mo 17-12-2 for Spectra 6/600, 6/650	1025321
Rotor Cr Ni Mo 17-12-2 for Spectra 5/1400	1025322
Rotor Cr Ni Mo 17-12-2 for Spectra 3/3000	1025323
Rotor Cr Ni Mo 17-12-2 for Spectra 3/6000, 3/6500	1025324
Rotor Cr Ni Mo 17-12-2 for Spectra 3/12000	1025325
Spare parts kit mech. sealing for Spectra 12/2 - 12/105	1025326
Spare parts kit mech. sealing for Spectra 6/300 - 5/1400	1025330
Spare parts kit mech. sealing for Spectra 3/3000	1025333
Spare parts kit mech. sealing for Spectra 3/6000, 3/6500	1025334
Spare parts kit mech. sealing for Spectra 3/12000	1025335
Pin joints spare parts kit Spectra 12/2 - 12/105	1025346
Pin joints spare parts kit Spectra 6/300 - 5/1400	1025350
Pin joints spare parts kit Spectra 3/3000	1025353
Pin joints spare parts kit Spectra 3/6000, 3/6500	1025354
Pin joints spare parts kit Spectra 3/12000	1025355

## 5.4 Spectra Eccentric Screw Pump

### 5.4.3 Technical Data

	Weight kg	Dimensions L x W x H (mm)	Housing material	Material rot. parts	Suction/discharge connection
Spectra 12/2 H	20	825 x 270 x 197	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/13 H	20	825 x 270 x 197	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/30 H	20	825 x 270 x 197	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/105 H	20	825 x 270 x 197	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 6/300 H	36	985 x 270 x 212	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 6/600 H	36	1,021 x 270 x 220	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 5/1400 H	36	1,021 x 270 x 220	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/3000 H	51	1,147 x 270 x 218	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/6000 H	71	1,354 x 270 x 249	Grey cast iron	Cr Ni Mo 17-12-2	DN 50, flange
Spectra 3/12000 H	116	1,812 x 270 x 337	Grey cast iron	Cr Ni Mo 17-12-2	DN 65, flange
Spectra 12/2 HB	24	825 x 270 x 285	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/13 HB	24	825 x 270 x 285	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/30 HB	24	825 x 270 x 285	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/105 HB	24	825 x 270 x 285	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 6/300 HB	43	985 x 270 x 292	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 6/600 HB	43	1,021 x 270 x 300	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 5/1400 HB	43	1,021 x 270 x 300	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/3000 HB	59	1,147 x 270 x 298	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/6000 HB	82	1,354 x 270 x 327	Grey cast iron	Cr Ni Mo 17-12-2	DN 50, flange
Spectra 3/12000 HB	131	1,812 x 270 x 417	Grey cast iron	Cr Ni Mo 17-12-2	DN 65, flange
Spectra 12/2 F	24	739 x 200 x 182	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/13 F	24	739 x 200 x 182	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/33 F	24	739 x 200 x 182	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/100 F	24	739 x 200 x 182	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 6/300 F	26	874 x 223 x 192	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 6/650 F	26	874 x 223 x 192	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 5/1400 F	26	874 x 223 x 192	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/3000 F	36	950 x 223 x 193	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/6500 F	56	1,172 x 237 x 224	Grey cast iron	Cr Ni Mo 17-12-2	DN 50, flange
Spectra 3/12000 F	81	1,487 x 264 x 244	Grey cast iron	Cr Ni Mo 17-12-2	DN 65, flange
Spectra 12/2 FB	28	739 x 220 x 232	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/13 FB	28	739 x 220 x 232	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/33 FB	28	739 x 220 x 232	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 12/100 FB	28	739 x 220 x 232	Cr Ni Mo 17-12-2	Cr Ni Mo 17-12-2	1/2", female
Spectra 6/300 FB	33	874 x 230 x 242	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 6/650 FB	33	874 x 230 x 242	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 5/1400 FB	33	874 x 230 x 242	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/3000 FB	44	950 x 230 x 242	Grey cast iron	Cr Ni Mo 17-12-2	1 1/4", female
Spectra 3/6500 FB	67	1,172 x 237 x 274	Grey cast iron	Cr Ni Mo 17-12-2	DN 50, flange
Spectra 3/12000 FB	96	1,487 x 265 x 294	Grey cast iron	Cr Ni Mo 17-12-2	DN 65, flange

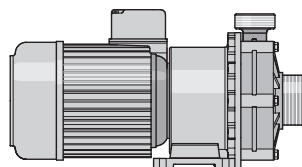
### 5.4.4 Motor Data

Type	Phases (el. connection)	Frequency	Enclosure rating	
Type H	3 ph	400	50	IP 55
Type F	3 ph	400	50	IP 55

3 PTC thermistors in winding  
external fan: 1~, 230 VAC, 50 Hz

## 5.5 von Taine® Centrifugal Pump

### 5.5.1 von Taine® Magnetically Coupled Centrifugal Pumps



pk\_3\_026

#### Metering pumps for liquid media.

von Taine® pumps are magnetically coupled centrifugal pumps. Thanks to the magnetic coupling, the pumps transport the liquid media leak-free from container to container or from a container into a pressure line. The von Taine® centrifugal pumps deliver media up to 22,500 l/hr and up to a delivery height of 23.5 metres. Because the capacity heavily depends on the backpressure, the delivery characteristic must be absolutely observed. When selecting the pumps, the material compatibility is to be checked and density, viscosity, solid fraction, and temperature of the delivered medium are to be considered. A low solid fraction in the delivered medium is permissible. The pump is not self-priming and requires a feed.

The following material types are available:

- Pump head: PP or PVDF
- Gaskets: FPM or EPDM

The bearings of the pumps are made of "oxide ceramics" and may not run dry. The pump is to be protected against running dry. The hydraulic connections are equipped with pipe threads according to DIN ISO 228-1 (internal and external thread cylindrical).

#### von Taine®, PP/FPM version

	Feed rate max. l/h	Feed lift max. m	Power Uptake kW	Voltage/frequency	Weight	Order no.
von Taine® 0502 PP/FPM	1,800	4.5	0.06	1~/230 V/50 Hz	2.7 kg	1023089
von Taine® 0807 PP/FPM	6,600	7.9	0.25	3~/400 V/50 Hz	5.0 kg	1023090
von Taine® 1010 PP/FPM	9,600	10.0	0.37	3~/400 V/50 Hz	7.6 kg	1023091
von Taine® 1313 PP/FPM	13,200	13.2	0.65	3~/400 V/50 Hz	8.7 kg	1023092
von Taine® 1820 PP/FPM	19,500	18.1	1.10	3~/400 V/50 Hz	16.0 kg	1023093
von Taine® 2323 PP/FPM	22,500	23.5	1.50	3~/400 V/50 Hz	17.0 kg	1023094

#### von Taine®, PVDF/FPM version

	Feed rate max. l/h	Feed lift max. m	Power Uptake kW	Voltage/frequency	Weight	Order no.
von Taine® 0502 PVDF/FPM	1,800	4.5	0.06	1~/230 V/50 Hz	2.8 kg	1023095
von Taine® 0807 PVDF/FPM	6,600	7.9	0.25	3~/400 V/50 Hz	5.2 kg	1023096
von Taine® 1010 PVDF/FPM	9,600	10.0	0.37	3~/400 V/50 Hz	8.0 kg	1023097
von Taine® 1313 PVDF/FPM	13,200	13.2	0.65	3~/400 V/50 Hz	9.0 kg	1023098
von Taine® 1820 PVDF/FPM	19,500	18.2	1.10	3~/400 V/50 Hz	16.7 kg	1023099
von Taine® 2323 PVDF/FPM	22,500	23.5	1.50	3~/400 V/50 Hz	17.7 kg	1023100



## 5.5 von Taine® Centrifugal Pump

### von Taine®, PP/EPDM version

	Feed rate max. l/h	Feed lift max. m	Power Uptake kW	Voltage/frequency	Weight	Order no.
von Taine® 0502 PP/EPDM	1,800	4.5	0.06	1~/230 V/50 Hz	2.7 kg	1028551
von Taine® 0807 PP/EPDM	6,600	7.9	0.25	3~/400 V/50 Hz	5.0 kg	1028552
von Taine® 1010 PP/EPDM	9,600	10.0	0.37	3~/400 V/50 Hz	7.6 kg	1028553
von Taine® 1313 PP/EPDM	13,200	13.2	0.65	3~/400 V/50 Hz	8.7 kg	1028564
von Taine® 1820 PP/EPDM	19,500	18.1	1.10	3~/400 V/50 Hz	16.0 kg	1028565
von Taine® 2323 PP/EPDM	22,500	23.5	1.50	3~/400 V/50 Hz	17.0 kg	1028566

### von Taine®, PVDF/EPDM version

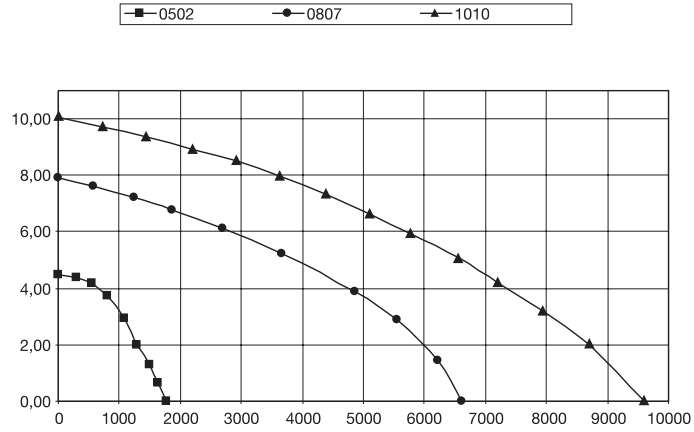
	Feed rate max. l/h	Feed lift max. m	Power Uptake kW	Voltage/frequency	Weight	Order no.
von Taine® 0502 PVDF/EPDM	1,800	4.5	0.06	1~/230 V/50 Hz	2.8 kg	1028567
von Taine® 0807 PVDF/EPDM	6,600	7.9	0.25	3~/400 V/50 Hz	5.2 kg	1028568
von Taine® 1010 PVDF/EPDM	9,600	10.0	0.37	3~/400 V/50 Hz	8.0 kg	1028569
von Taine® 1313 PVDF/EPDM	13,200	13.2	0.65	3~/400 V/50 Hz	9.0 kg	1028570
von Taine® 1820 PVDF/EPDM	19,500	18.1	1.10	3~/400 V/50 Hz	16.7 kg	1028571
von Taine® 2323 PVDF/EPDM	22,500	23.5	1.50	3~/400 V/50 Hz	17.7 kg	1028572

### Parameters For Use

	Medium temperature max. °C	Maximum density kg/dm <sup>3</sup>	max. Viscosity m Pas	max. System pressure at 20° C bar
von Taine® 0502 PP	80	1.25...1.35	20	1.0
von Taine® 0807 PP	80	1.20...1.80	20	2.5
von Taine® 1010 PP	80	1.60...2.00	20	2.5
von Taine® 1313 PP	80	1.60...1.90	20	2.5
von Taine® 1820 PP	80	1.10...1.80	20	5.0
von Taine® 2323 PP	80	1.00...2.00	20	5.0
von Taine® 0502 PVDF	95	1.25...1.35	20	1.0
von Taine® 0807 PVDF	95	1.20...1.80	20	2.5
von Taine® 1010 PVDF	95	1.60...2.00	20	2.5
von Taine® 1313 PVDF	95	1.60...1.90	20	2.5
von Taine® 1820 PVDF	95	1.10...1.80	20	5.0
von Taine® 2323 PVDF	95	1.00...2.00	20	5.0

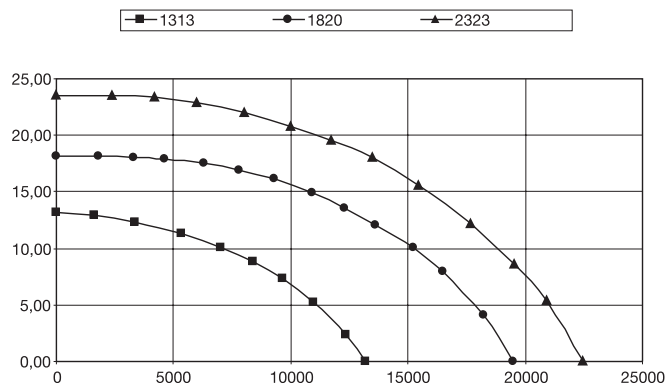
# 5.5 von Taine® Centrifugal Pump

## Characteristic Curves



pk\_2\_080\_1

Delivered quantity [l/h] as a function of delivery head [mWC]

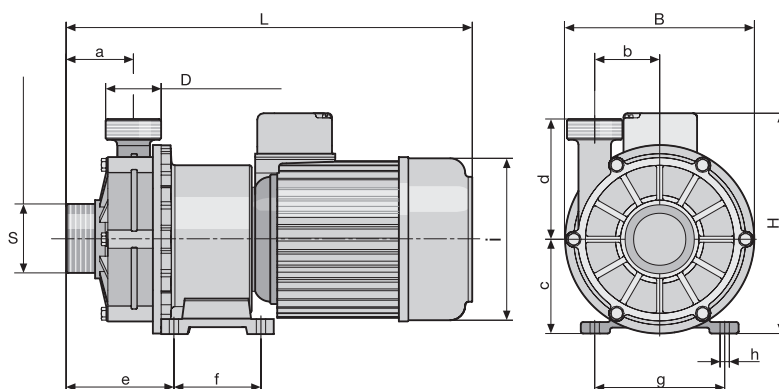


pk\_2\_115

Delivered quantity [l/h] as a function of delivery head [mWC]

# 5.5 von Taine® Centrifugal Pump

## Dimensions



pk\_3\_027

		von Taine® 0502 PVDF	von Taine® 0807 PVDF	von Taine® 1010 PVDF	von Taine® 1313 PVDF	von Taine® 1820 PVDF	von Taine® 2323 PVDF
<b>Discharge connector (D)</b>		G 1"	G 1 1/4"	G 1 1/2"	G 1 1/2"	G 2"	G 2"
<b>Suction connector (S)</b>		G 1 1/4"	G 1 1/4"	G 2"	G 2"	G 2 1/4"	G 2 1/4"
<b>L</b>	mm	240	283	320	350	430	430
<b>B</b>	mm	120	138	163	163	205	205
<b>H</b>	mm	145	185	191	191	227	227
<b>a</b>	mm	37.0	45.0	58.5	58.5	70.0	70.0
<b>b</b>	mm	29.5	29.5	56.0	56.0	70.0	70.0
<b>c</b>	mm	60.0	70.0	82.0	82.0	104.5	104.5
<b>d</b>	mm	65.5	86.0	104.0	104.0	134.5	134.5
<b>e</b>	mm	129	50	106	106	115	115
<b>f</b>	mm	78	71	74	74	100	100
<b>g</b>	mm	91	91	114	114	130	130
<b>h</b>	mm	6.5	8.5	8.5	8.5	10.0	10.0
<b>i</b>	mm	92	135	135	135	155	155
<b>Enclosure rating</b>		IP 55	IP 55	IP 55	IP 55	IP 55	IP 55
<b>Min. flow</b>	l/h	30	60	60	60	90	120

## 5.5 von Taine® Centrifugal Pump

### 5.5.2

### Spare Parts Kits

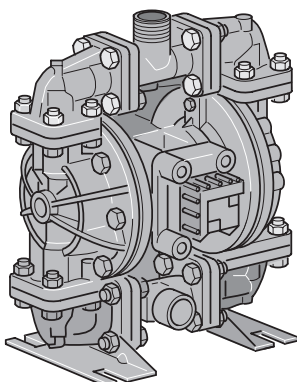
	<b>Order no.</b>
PP/FPM liquid end for von Taine 0502	1023978
PP/FPM liquid end for von Taine 0807	1023979
PP/FPM liquid end for von Taine 1010	1023980
PP/FPM liquid end for von Taine 1313	1023981
PP/FPM liquid end for von Taine 1820	1023982
PP/FPM liquid end for von Taine 2323	1023983
PVDF/FPM liquid end for von Taine 0502	1023994
PVDF/FPM liquid end for von Taine 0807	1023995
PVDF/FPM liquid end for von Taine 1010	1023996
PVDF/FPM liquid end for von Taine 1313	1023997
PVDF/FPM liquid end for von Taine 1820	1023998
PVDF/FPM liquid end for von Taine 2323	1023999

	<b>Order no.</b>
PP/FPM liquid end for von Taine 0502	1028573
PP/FPM liquid end for von Taine 0807	1028574
PP/FPM liquid end for von Taine 1010	1028575
PP/FPM liquid end for von Taine 1313	1028576
PP/FPM liquid end for von Taine 1820	1028577
PP/FPM liquid end for von Taine 2323	1028578
PVDF/FPM liquid end for von Taine 0502	1028579
PVDF/FPM liquid end for von Taine 0807	1028580
PVDF/FPM liquid end for von Taine 1010	1028581
PVDF/FPM liquid end for von Taine 1313	1028582
PVDF/FPM liquid end for von Taine 1820	1028583
PVDF/FPM liquid end for von Taine 2323	1028584

	<b>Order no.</b>
Motor for von Taine 0502	1024000
Motor for von Taine 0807	1024001
Motor for von Taine 1010	1024002
Motor for von Taine 1313	1024003
Motor for von Taine 1820	1024004
Motor for von Taine 2323	1024005

## 5.6 Duodos Air Operated Diaphragm Pump

### 5.6.1 Duodos Air Operated Diaphragm Pumps



pk\_2\_062

Duodos pumps are air operated double diaphragm pumps. Thanks to the operation with air, the pump has no electrical components. Duodos pumps are dry-running safe and self-priming. By adjusting the pressure in the air supply, the delivery rate of the pump can be controlled. The air control is designed for oil-free operation. The maintenance-free air control valve facilitates a trouble-free operation and guarantees a re-start. No pressure-control valves are required, the pump simply stops in case of high backpressure and re-starts automatically if the pressure is released. Duodos pumps are the optimal solution for metering liquid chemicals. Duodos pumps transport media up to approx. 6,700l/h or up to a delivery height of 70m. Because the capacity heavily depends on the backpressure, the delivery characteristic must be absolutely observed. But the differential pressure between the hydraulic and the pneumatic end should not exceed the value of 2 bar. Higher values reduce the life of the pump. When selecting the pump, the material compatibility should be checked. In addition, density, viscosity, solid fraction, and temperature of the delivered medium are to be considered.

The following materials are available:

- PP pump chambers with Santoprene® diaphragms and valves
- PVDF pump chambers with PTFE diaphragms and valves

#### Parameters For Use

	Min. temperature °C	Max. temperature °C	max. Viscosity m Pas	Suction capacity dry m	Suction capacity wet m
Duodos 10 PP	5	65	200	1.7	7.7
Duodos 10 PVDF	-13	93	200	1.7	7.7
Duodos 15 PP	5	65	200	3.6	8.2
Duodos 15 PVDF	-13	93	200	2.3	8.2
Duodos 20 PP	5	65	200	1.8	8.2
Duodos 20 PVDF	-13	93	200	2.1	8.2
Duodos 25 PP	5	65	200	5.1	8.2
Duodos 25 PVDF	-13	93	200	5.4	8.2

#### Duodos PP

	Housing material	Diaphragms/ valves	Delivery rate (2 bar differential pressure) l/h	Order no.
Duodos 10 PP	PP	Santoprene®	0...650*	1010793
Duodos 15 PP	PP	Santoprene®	0...2,000*	1010794
Duodos 20 PP	PP	Santoprene®	0...3,000*	1010795
Duodos 25 PP	PP	Santoprene®	0...6,700*	1010796

Delivery rate at a differential pressure of 2 bar (0.5 bar backpressure, 2.5 bar air pressure)..

Santoprene® is a registered trademark of the Monsanto Corporation.

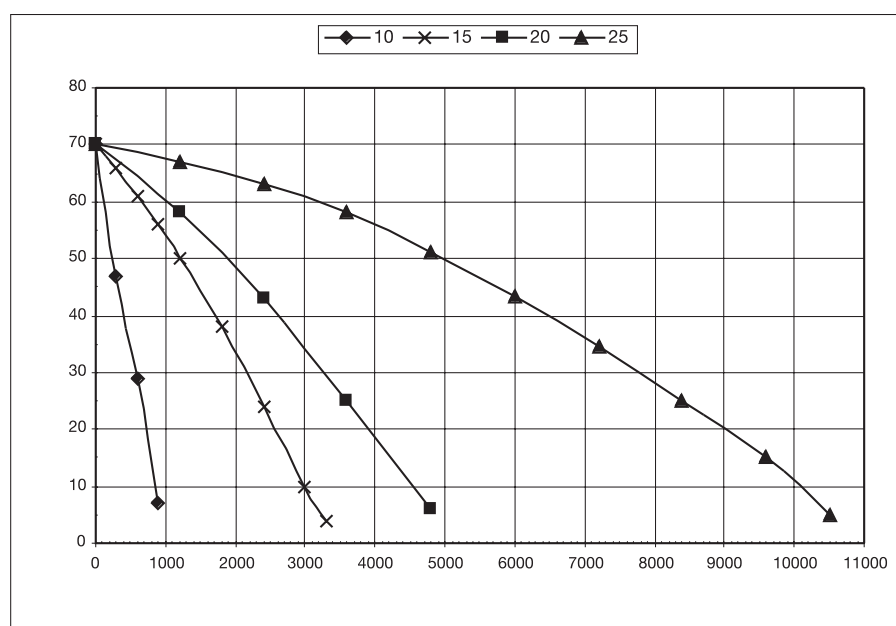
## 5.6 Duodos Air Operated Diaphragm Pump

### Duodos PVDF

	Housing material	Diaphragms/valves	Delivery rate (2 bar differential pressure) l/h	Order no.
<b>Duodos 10 PVDF</b>	PVDF	Teflon	0...650*	1010797
<b>Duodos 15 PVDF</b>	PVDF	Teflon	0...2,000*	1010798
<b>Duodos 20 PVDF</b>	PVDF	Teflon	0...3,000*	1010799
<b>Duodos 25 PVDF</b>	PVDF	Teflon	0...6,700*	1010800

Delivery rate at a differential pressure of 2 bar (0.5 bar backpressure, 2.5 bar air pressure).

### Characteristic Curves



pk\_2\_114

Feed lift [mWS] over feed rate [l/h] at 7 bar air supply

### 5.6.2

### Spare Part Kits

Spare part kits for pneumatics comprising:

- Seals
- O-rings
- Clamp collars
- Air control valve

	Order no.
<b>Spare part kit, pneumatics for Duodos 10 PP/PVDF</b>	1010810
<b>Spare part kit, pneumatics for Duodos 15/20 PP/PVDF</b>	1010811
<b>Spare part kit, pneumatics for Duodos 25 PP/PVDF</b>	1010813

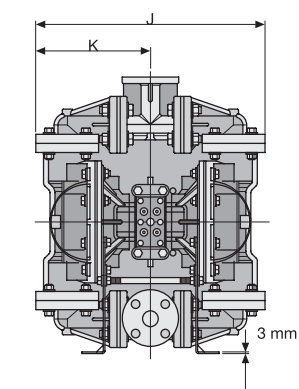
## 5.6 Duodos Air Operated Diaphragm Pump

### Spare part kits for the liquid end comprising

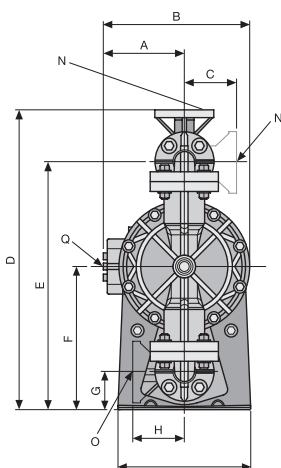
- Diaphragms
- Valve balls
- Seals

	Order no.
Spare part kit, liquid end for Duodos 10 PP	1010801
Spare part kit, liquid end for Duodos 15 PP	1010802
Spare part kit, liquid end for Duodos 20 PP	1010803
Spare part kit, liquid end for Duodos 25 PP	1010804
Spare part kit, liquid end for Duodos 10 PVDF	1010806
Spare part kit, liquid end for Duodos 15 PVDF	1010807
Spare part kit, liquid end for Duodos 20 PVDF	1010808
Spare part kit, liquid end for Duodos 25 PVDF	1010809

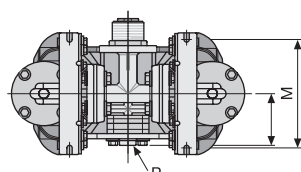
### Dimensions



pk\_2\_072



pk\_2\_106

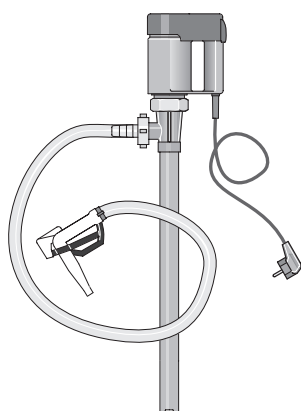


pk\_2\_107

		Duodos 10	Duodos 15	Duodos 20	Duodos 25
<b>A</b>	mm	79	103	103	143
<b>B</b>	mm	140	179	179	260
<b>C</b>	mm	32	44	60	92
<b>D</b>	mm	198	287	339	527
<b>E</b>	mm	167	243	279	435
<b>F</b>	mm	87	140	163	249
<b>G</b>	mm	19	35	46	64
<b>H</b>	mm	32	44	60	92
<b>I</b>	mm	78	143	143	130
<b>J</b>	mm	178	258	300	433
<b>K</b>	mm	89	129	150	216
<b>L</b>	mm	33	92	114	123
<b>M</b>	mm	66	76	76	102
<b>Discharge connector</b>		1/2" NPT	1"	1 1/2"	1" ANSI flange
<b>Suction connector</b>		1/2" NPT	1"	1 1/2"	1" ANSI flange
<b>Air consumption</b>	m <sup>3</sup> /h	0.5...11	3.5...27	7.0...34	8.5...77
<b>Differential pressure</b>	bar	2	2	2	2
<b>Air connection</b>		1/4" NPT	1/4" NPT	1/4" NPT	1/2" NPT
<b>Weight (PP)</b>	kg	2	8	9	24
<b>Weight (PVDF)</b>	kg	2.5	9.0	9.5	29.0

## 5.7 DULCO®Trans Barrel Pump

### 5.7.1 DULCO®Trans Barrel Pumps



pk\_3\_029

DULCO®Trans is used for bottling, emptying and transferring liquids from canisters, hobbocks, barrels, tanks and containers. The capacity of the DULCO®Trans is 900, 2,400 or 3,000 l/h, depending on the size. Included in the delivery is a metering hose with pump nozzle. The application range of the DULCO®Trans depends on the chemical resistance of the used materials.

The following materials come into contact with the liquids:

- polypropylene external and internal pipe, pump nozzle
- Hastelloy C drive shaft
- ETFE rotor
- oxide ceramics/PTFE/carbon floating ring seal
- FPM O-rings
- PVC metering hose

A flexible coupling connected to the drive shaft serves as connection between the drive motor and the pump. At the end of the drive shaft, the rotor is located which presses the liquid between the internal pipe and the external pipe to the top. The drive shaft is located in the internal pipe and is mechanically sealed at the shaft feedthrough. The shaft thus only comes into contact with the medium in the rotor zone. The sealing between internal pipe and external pipe is made using an O-ring made of FKM. The internal pipe is reinforced by a steel core; the pump thus receives the stability which is required for a proper functioning of the floating ring seal.

	Feed rate max. *	Feed lift max. m	Order no.
<b>DULCO®Trans 25/700 PP</b>	900 l/h *	5.0	1023085
<b>DULCO®Trans 40/1000 PP</b>	2400 l/h *	7.5	1023086
<b>DULCO®Trans 50/1200 PP</b>	3000 l/h *	12.0	1023087

\* The specified delivery rate includes hose and pump nozzle.

#### Parameters For Use

	Medium temperature max. °C	Maximum density *	max. Viscosity m Pas
<b>DULCO®Trans 25/700 PP</b>	50	1.2 kg/dm <sup>3</sup> *	150
<b>DULCO®Trans 40/1000 PP</b>	50	1.5 kg/dm <sup>3</sup> *	500
<b>DULCO®Trans 50/1200 PP</b>	50	1.8 kg/dm <sup>3</sup> *	500

\* The pumps can also be used at higher density values for short periods.



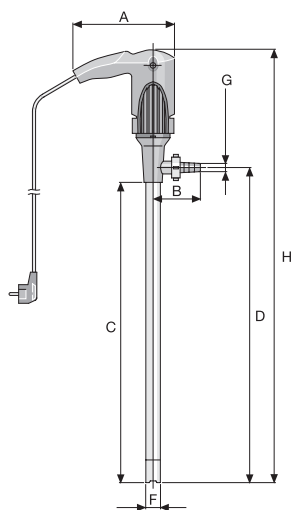
## 5.7 DULCO®Trans Barrel Pump

### Technical data

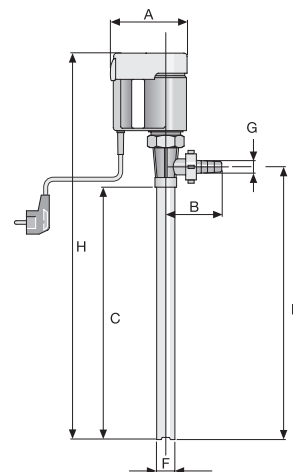
	DULCO®Trans 25/700 PP	DULCO®Trans 40/1000 PP	DULCO®Trans 50/1200 PP
<b>Feed rate max.</b>	900 l/h	2,400 l/h	3,000 l/h
<b>Feed lift max.</b>	5.0 m	7.5 m	12.0 m
<b>Suction pipe immersion depth</b>	672mm	961mm	1,161mm
<b>Suction pipe outer diameter</b>	25mm	40mm	50mm
<b>Hose connection</b>	d13	d19	d25
<b>Discharge hose</b>	1.5 m, PVC, 13/18 mm	2.0 m, PVC, 19/27 mm	3.0 m, PVC, 25/34 mm
<b>Dispensing gun</b>	PP, d 13	PP, d 19	PP, d 25
<b>Motor rating</b>	230 W	450 W	800 W
<b>Enclosure rating</b>	IP 24	IP 24	IP 24
<b>Voltage/frequency</b>	230 V/1~/50 Hz	230 V/1~/50 Hz	230 V/1~/50 Hz
<b>Under-voltage cut-out</b>	without	with	with
<b>Overvoltage safety switch</b>	with	with	with
<b>Connection cable</b>	5 m, with EUR plug	5 m, with EUR plug	5 m, with EUR plug
<b>Weight</b>	2.4 kg	4.9 kg	7.4 kg
<b>Dimensions H x W x D</b>	927 x 197 x 83mm	1,260 x 171 x 95mm	1,489 x 217 x 115mm

### Dimensions

		DULCO®Trans 25/700 PP	DULCO®Trans 40/1000 PP	DULCO®Trans 50/1200 PP
<b>A</b>	mm	197	171	217
<b>B</b>	mm	83	113	113
<b>C</b>	mm	672	961	1,161
<b>D</b>	mm	700	1,006	1,206
<b>F</b>	mm	25	40	50
<b>G</b>		d 13	d 19	d 25
<b>H</b>	mm	927	1,260	1,489



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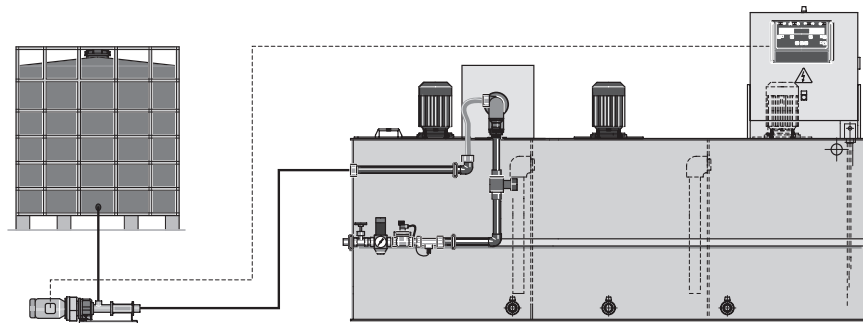
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## 5.8 Application Examples

### 5.8.1 Metering Polymers

Product:	<b>Eccentric screw pump Spectra</b>
Metering medium:	<b>Polymer, liquid concentrate</b>
Industry:	<b>Waste water</b>
Application:	<b>Treatment of flocculants</b>

Production of a 0.5% polymer solution with the Ultramat® AFT 2000 and Spectra 12/33 F. The Spectra pump feeds the polymer concentrate from the disposable container to the Ultramat®.



pk\_3\_049

#### Task and requirements

Preparation of a 0.1 – 0.5 % polymer solution.

#### Operating conditions

- Fluctuating water feed
- Automatic activation of progressive cavity pump
- Highly viscous medium

#### Application information

- Gauge capacity of progressive cavity pump during initial operation
- Provide dry-running protection facility for progressive cavity pump
- Proportional metering of liquid polymer as a function of water feed
- Activation of progressive cavity pump by means of a frequency converter

#### Solution

- Spectra 12/33 F progressive cavity pump for metering liquid concentrate
- ATF 2000 Ultramat for preparing a 0.1 – 0.5 % polymer solution

#### Benefits

- Constant solution concentration also in connection with fluctuating water feed
- Fully automatic operation with minimum personnel and maintenance requirements
- Flexible process configuration by adapting the pump to different concentration requirements

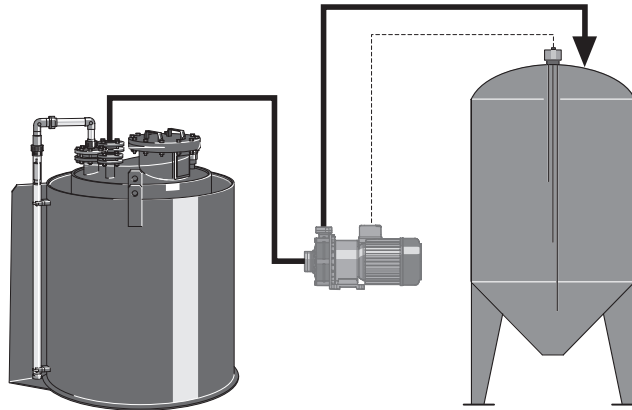
## 5.8 Application Examples

### 5.8.2

### Filling a Day Tank

Product:	<b>vonTaine® centrifugal pump</b>
Metered medium:	<b>32 % hydrochloric acid solution</b>
Sector:	<b>Food</b>
Application:	<b>Chemical transfer</b>

The von Taine® centrifugal pump is switched on and off automatically by the level control facility in the day tank.



pk\_3\_050

#### Task and requirements

- Automatically filling service tanks with 32 % hydrochloric acid solution

#### Operating conditions

- Indoor operation
- Automatic activation of pump

#### Application information

- Centrifugal pump controlled by level control facility in metering tank
- The centrifugal pump is not self-priming and requires feed
- Hydrochloric acid compatibility of materials must be ensured (PP, PVDF; EPDM)
- Provide dry-running protection facility for centrifugal pump

#### Solution

- vonTaine® 1820 PP centrifugal pump
- Service tank with level control

#### Benefits

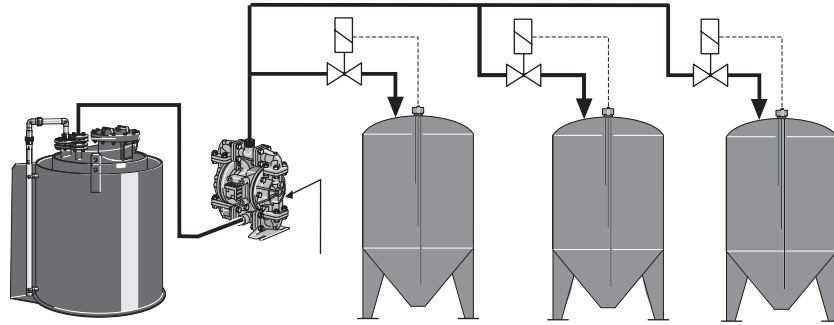
- Safe handling of hydrochloric acid
- Fully automatic operation with minimum personnel and maintenance requirements

## 5.8 Application Examples

### 5.8.3 Filling Day Tanks

Product:	<b>Duodos air operated diaphragm pump</b>
Metered medium:	<b>Detergent</b>
Sector:	<b>Laundry</b>
Application:	<b>Chemical transfer</b>

The level control facility for the day tanks opens the solenoid valves when the level drops below minimum. With decreasing backpressure, the Duodos pump automatically begins to pump medium into the metering line and switches off when the maximum level in the tank is reached and the solenoid valve is switched off.



pk\_3\_051

#### Task and requirements

- Automatic filling of day tanks with detergent

#### Operating conditions

- Compressed air necessary for operating compressed air diaphragm pump
- Automatic filling of day tanks

#### Application information

- Compressed air diaphragm-type pump controlled by level control facility in metering tank
- The compressed air diaphragm pump is self-priming
- Also suitable for viscous media
- The level control facility for the day tanks opens the solenoid valves when the level drops below minimum. With decreasing backpressure, the compressed air diaphragm-type pump automatically begins to pump medium into the metering line and switches off when the maximum level in the tank is reached and the solenoid valve is switched off

#### Solution

- Duodos air operated diaphragm pump
- Day tank with level control

#### Benefits

- Simplified logistics through central storage
- Fully automatic operation with minimum personnel and maintenance requirements

- **Service**
- **Sales**

# 1 Service

You can make full use of our services even if you are not yet one of our customers. Our pre-sales services ensure that you get the optimum solution for your individual needs:

- Advice in choosing the products
- Application and process optimisation
- Project planning

However, our commitment does not end with delivery. We offer you a comprehensive after-sales service, which lasts for the entire service life of your equipment. That maximises your productivity and minimises your operating costs:

- Assembly/installation
- Commissioning
- Maintenance
- Spare parts service
- Repair
- Troubleshooting

Thanks to our worldwide presence in over 100 countries, our service is available wherever you need it.

## 1.1

### Services

#### **Mounting/installation**

Quality starts with the correct installation of our systems. That's why we offer you a professional installation by trained service technicians.

We offer the following installation work:

- running pipelines in PE, PVC and PVDF materials
- carrying out electrical installation work
- linking the system to a PLC

If required, we also carry out conversions and plant extensions. Your advantage: plant and installation from a single source.

#### **Commissioning: the right start for your system**

Our service technicians will ensure professional system commissioning and start-up. You profit from knowing that the processes are set up correctly and the machine is running optimally from the very outset. Following successful commissioning, the service technician will provide information on the set system parameters and will train the system operators.

#### **Maintenance: an essential requirement for consistently high reliability**

Routine preventative maintenance performed by our service technicians increases operational reliability, lowers operating costs and extends the service life of your system. We offer maintenance contracts for this, individually tailored to your needs.

#### **Repairs: on our premises or yours**

Whether it's a works repair or an express job on site, you're assured of a professional repair using genuine spare parts.

#### **Troubleshooting: If really something shouldn't work**

Of course, queries on the operation of our products or systems do come up from time to time. Maybe the operation is not quite clear, or you'd like to change the process, or make other modifications, perhaps one of our products just isn't working correctly, for whatever reason at all. No problem. Our technical advisers will be pleased to help you. In most cases, your query can be answered over the telephone. If that's not possible, our adviser will take the necessary steps to help you as quickly as possible. This can be by sending in a service technician, despatch of spare or replacement parts, or other measures, depending on the situation.

# 1 Service

## 1.2 Service Contacts

**For customers from Germany:**

Some services are rendered by ProMaqua GmbH.

Services	Telephone +49 6221 6489-	Fax +49 6221 6489-	eMail
Mounting/installation	-402	-400	service@promaqua.com
Commissioning	-402	-400	service@promaqua.com
Maintenance	-402	-400	service@promaqua.com
On-site repair	-402	-400	service@promaqua.com

Repairs	Telephone +49 6221 842-	Fax +49 6221 842-	
for postcode areas 0 ... 4	-328	-441	CustomerCare@prominent.de
for postcode areas 5 ... 9	-308	-441	CustomerCare@prominent.de

**For customers from other countries:**

Please contact your local ProMinent branch or agency.

## 1.3 Training

The training programme of ProMinent Academy for Water Technology is mainly geared to customers from Germany.

Customers from other countries are kindly requested to contact the local ProMinent branch or agency. Their home pages are also available for information and contact options under the heading "Company – Locations".

The range of courses offered has been widened this year, and now provides an even more effective opportunity to widen your knowledge of ProMinent® instrumentation, get to know new equipment, and swap experiences.

The courses are divided into free subject seminars and intensive courses for which a charge is made. The subject seminars offer all those responsible for processes, planners, plant engineers and plant constructors, the possibility of getting to know the full ProMinent product programme covering all sectors. Specialised subject seminars on the fields of drinking water, swimming pools and legionella prevention are offered in addition.

The intensive seminars are intended for all users from the operation, maintenance and service field who want to gain more in-depth practical experience with individual items of ProMinent equipment. As well as dosing pump workshops, we also offer workshops on measurement and control equipment, Bello Zon® chlorine dioxide plants and Dulcodes UV systems with DVGW certification (DVGW = German Gas and Water Association).

All training courses are held in our Seminar Centre in Heidelberg, which is equipped with the very latest media equipment and two practical training rooms. So that we can deal with customer needs as individually and comprehensively as possible, we have limited the number of participants per course to 15.

## 1.4 Training Contacts

Detailed information on the current training programme is available via our home page ([www.prominent.com](http://www.prominent.com)) under the heading „Service“, or direct from our training department.

<b>Address:</b>	ProMinent Dosiertechnik GmbH ProMinent Akademie für Wassertechnologie F.A.O. Mrs. Jeanette Lindenau Im Schuhmachergewann 5-11 69123 Heidelberg
<b>Administration:</b>	Mrs. Jeanette Lindenau
<b>Training manager:</b>	Dr. Klaus Fuchs
<b>Telephone:</b>	+49 6221 842-318 (Mrs. J. Lindenau) +49 6221 842-0 (switchboard)
<b>Fax:</b>	+49 6221 842-453 F.A.O. Mrs. J. Lindenau
<b>E-Mail:</b>	J.Lindenau@prominent.de

**For customers from other countries:**

Please contact your local ProMinent branch or agency.

## 2 Sales

### 2.1 The ProMinent Group

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-0  
-433 Management  
-617 Sales Chemical Fluid Handling  
-419 Exports  
-220 Purchasing  
-435 Research and Development  
-627 EDP/Technical/Legal  
-432 Advertising  
-400 Sales ProMaqua

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## 2 Sales

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#### ProMinent Fluid Controls, Inc. (USA)

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Bahrain

Bolivia

Botswana

Cameroon

Colombia

Costa Rica

Croatia

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Ecuador

Egypt

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Mauritius

Montenegro

Mozambique

Namibia

New Zealand

Nigeria

Norway

Oman

Pakistan

Panama

Paraguay

Peru

Philippines

Qatar

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Serbia

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Sudan

Syria

Tanzania

Tunisia

Turkey

Turkmenistan

UAE

Uganda

Uruguay

Venezuela

Vietnam

White Russia

Zambia

Zimbabwe

Addresses of distributors are available from ProMinent Dosiertechnik GmbH · Im Schuhmachergewann 5-11 · 69123 Heidelberg · Germany

## 2 Sales

### 2.2 General Terms And Conditions Of Delivery

The valid General Terms and Conditions, which can be viewed on the ProMinent homepage, become material part of the contract.

#### I. Scope of application

- (1) The present terms and conditions of delivery shall apply exclusively; deviating conditions or conditions contrary of the customer shall only apply provided the supplier approved of this in writing.
- (2) The present General Terms and Conditions of Delivery shall also apply to subsequent orders and to replacement parts deliveries without necessitating repeated pointing out of this fact.
- (3) Supplements and representations as well as modifications or amendments to a contract concluded in writing or by tel-ex must be in writing.

#### II. Offer and order confirmation

- (1) Offers shall only be binding provided a time-limit for acceptance is stated in the offer. To be legally binding, offers shall require the written confirmation of the supplier.
- (2) The supplier reserves any titles to and copyrights in figures, drawings, calculations, and other offer documentation and similar information of physical and non-physical type - also in electronic form; these may only be disclosed to third parties on the supplier's written approval and shall be immediately returned to the supplier on request if no order is awarded to the supplier.

#### III. Scope of deliveries and services

- (1) The deliveries and services are determined based on the mutual written declarations. If no such declarations exist, the written order confirmation of the supplier shall be decisive. For mere sales contracts, the agreed upon delivery provisions shall be interpreted according to the INCOTERMS valid at the conclusion of the contract.
- (2) Data in brochures, catalogues or general technical documentation shall only be binding if reference is made to them in writing.
- (3) The costs for an agreed mounting and assembly, including all and any required ancillary costs such as travel expenses or costs for the transport of tools or personal luggage shall be remunerated separately by the customer, if not otherwise agreed upon.
- (4) If software is part of the delivery scope, the customer shall be granted a non-exclusive right of use in the software. The customer may copy or edit the software only in the legally permissible scope.
- (5) Partial deliveries shall be permissible, provided it is reasonable for the customer, considering the interests of both the supplier and the customer.
- (6) In case of deliveries abroad, the supplier's obligation shall be under the proviso that any necessary export licences are granted.

#### IV. Prices and terms of payment

- (1) All prices shall be in EURO unless otherwise stated. They shall apply to mere delivery transactions "ex works" (EXW), exclusive of packaging.
- (2) The prices do not include any turnover tax. This tax is itemised separately in the invoice in the statutory amount applicable at the date of invoicing.
- (3) The deduction of discounts shall require a

special agreement in writing.

- (4) If not otherwise shown in the order confirmation, the sales price shall be due for payment 30 days from invoice date without any deduction.
- (5) If the customer does not comply with the date for payment, the customer shall pay default interest in the amount of 8 percentage points above the base interest rate pursuant to §247 German Civil Code from the due date. Payment of further damages remains reserved.
- (6) If not otherwise agreed upon, the delivery of goods for deliveries abroad shall be under the proviso that an irrevocable commercial letter of credit is issued by the customer in favour of the supplier, and confirmed by a German banking institution.
- (7) In case of delayed payment, the supplier may suspend the performance of his own obligations until total payment was received, giving written notice to the customer.
- (8) The customer may only set off claims or assert a right of retention, provided these are undisputed or have become non-appealable.

#### V. Time-limits for deliveries or services

- (1) With regard to time-limits, the mutual written declarations or, in the absence of such declarations, the written order confirmation of the supplier shall be decisive. The time-limit shall be deemed observed, provided all and any documentation to be provided by the customer are received in time, and all and any required permits, releases, in particular plans, are provided, and the agreed upon terms of payment and other obligations are met by the customer. If these prerequisites are not met in time, the time-limit shall be prolonged reasonably; this shall not apply if the supplier is responsible for the delay.
- (2) If non-observance of the time-limits is the result of force majeure, e.g. mobilization, war, riot or similar events, e.g. strike or lock-out, the agreed upon time-limits shall be prolonged reasonably.
- (3) If mounting and assembly are not part of the agreed upon services, the time-limit shall be deemed observed if the goods ready for operation were shipped or collected within the time-limit. Should the delivery be delayed for reasons for which the customer is responsible, the time-limit shall be deemed observed upon notification of readiness for shipment.
- (4) If the supplier is responsible for the non-observance of the time-limit, the customer, provided the customer suffered an actual loss, may request compensation for delay for each full week of delay of a maximum of 0.5%, however, not exceeding 5% of the price for the part of the delivery which could not be taken into relevant operation because of the delay. Claims for compensation of the customer exceeding the limits stipulated in item 5.4 shall be excluded in all cases of delayed delivery or service, also after expiry of any grace period set to the supplier. This shall not apply to the extent mandatory liability exists in cases of intent, gross negligence or personal injury; a shift

of the burden of proof to the disadvantage of the customer is not given in this case.

- (5) The customer's right to withdraw after ineffectual expiry of a grace period for the supplier shall remain unaffected. The grace period, however, must be reasonable and amount to at least four weeks.
- (6) If shipment or delivery are delayed for more than one month after notice of readiness for shipment on the customer's request, warehouse charges in the amount of 0.5% of the price of the delivery goods, however, not exceeding a total of 5%, may be charged to the customer for each month started. The parties to the contract shall remain free to furnish proof of higher or lower warehouse charges.

#### VI. Passage of utility and risk; insurance; packaging

- (1) The risk of deliveries and services rendered by the supplier shall pass to the customer as follows, even in case of deliveries freight paid.
  - a) for deliveries without mounting or assembly, even in case of partial deliveries, if these have been shipped or collected. Shipments shall be insured by the supplier against the usual transport risks upon wish and at the expense of the customer. If such insurance exists, the supplier shall be immediately notified about any damages to goods in transit.
  - b) for deliveries with mounting or assembly on the day of acceptance in the customer's operations or, if agreed upon, after perfect test operation.
- (2) If the shipment, delivery, start, performance of mounting or assembly, acceptance in the customer's operations or test operation is/are delayed for reasons attributable to the customer or if the customer delays acceptance for other reasons, the risk shall pass to the customer.
- (3) The shipment is in principle made in standard packagings of the supplier. The latter shall be entitled to choose special types of packaging deemed necessary in the supplier's discretion. The costs of these packagings shall be borne by the customer.

#### VII. Mounting and assembly

The mounting, assembly and installation of the equipment and devices of the supplier may only be performed by specialists, observing the supplier's guidelines and the applicable technical standards. If mounting and/or assembly are performed by the supplier, the following provisions shall apply, if not otherwise agreed upon in writing:

- (1) The customer shall assume and provide in time at the customer's expense:
  - a) all earthwork, construction work and other different ancillary work, including therefor specialists and auxiliary staff, materials and tools,
  - b) the commodities and materials such as scaffolds, cranes and elevators and other devices, fuels, lubricants, and chemicals required for assembly and commissioning,
  - c) energy and water at the site of use, including connections, heating, and illumina-

nation,

- d) sufficiently large, suitable, dry and lockable rooms at the assembly site for storing machine parts, fixings, materials, and tools etc., and suitable working and recreation rooms for the assembly staff, including appropriate sanitary installations. For the protection of the supplier's property and the assembly staff, the customer shall also take the measures he normally would take to protect his own property.
  - e) protective clothing and protective devices which are necessary because of special circumstances at the assembly site.
- (2) Prior to the start of the assembly work, the customer shall unsolicitedly provide the required information about the position of subsurface energy, gas, water conduits or similar installations as well as the required data on statics.
  - (3) Prior to the start of mounting or assembly, the additions and objects required to start the work must be at the mounting or assembly site and all preparations prior to start of the installation must be advanced such that the mounting or assembly can be started as agreed upon and can be performed without any interruptions. Access routes and the mounting or assembly site must be flattened and clear of any objects.
  - (4) Should mounting, assembly or commissioning be delayed for reasons beyond the control of the supplier, the customer shall bear the costs for waiting time and additionally required travels of the supplier or the assembly staff in an adequate amount.
  - (5) If a plant cannot be installed immediately after delivery, the customer shall be responsible for a proper storage according to the supplier's guidelines.
  - (6) The customer shall provide the supplier with weekly information on the duration of the working hours of the assembly staff and shall immediately confirm the completion of mounting, assembly or commissioning.
  - (7) The commission may only be performed by technicians acknowledged by the supplier and according to the supplier's instructions. The technicians shall be entitled to refuse commissioning of the plant if the operating conditions to be provided by the customer do not guarantee a safe operation of the plant. The customer shall bear the costs of any delay in commissioning incurred to the supplier.
  - (8) Should the supplier request acceptance of the deliveries and services after completion, the customer shall be obliged to do so within two weeks. Otherwise, the acceptance shall be deemed made. The acceptance shall be deemed made, too, if the delivery goods and services - also after completion of an agreed test phase, if any - have been taken in use.

### VIII. Warranty

- (1) Should goods delivered or services rendered by the supplier prove to be defective because they do not possess the agreed quality or because they are not suitable for the agreed or usual use, the supplier shall in its discretion either remedy the parts or services concerned or deliver or render them again at no cost within the limitation period, provided the cause of the defect already existed at the time of risk passing.
- (2) Claims for material defects become statute-barred after 12 months, for ProMinent® pump drives and DULCOMETER® controllers the period is 24 months. The time-limit shall start with passing of the risk (item 6).

The above provisions shall not apply to the extent the law mandatorily prescribes longer time-limits according to §§438(1) no. 2 German Civil Code (goods for edifices), §479(1) German Civil Code (right of recourse), and §634a German Civil Code (structural defects). The warranty period may be prolonged up to 60 months in suitable cases, provided the customer concludes a maintenance contract for the corresponding period.

- (3) The customer shall immediately give notice of defects to the supplier.
- (4) In the event of notices of defects, payments of the customer may be retained in the volume which shows a reasonable ratio to the material defects incurred. The customer may retain payments only if a notice of defect is given whose justification is beyond doubt. If the notice of defect is given wrongfully, the supplier shall be entitled to request from the customer compensation for the expenses incurred to the supplier.
- (5) At first, the supplier shall always be given the opportunity to post-perform within a reasonable time-limit. The customer shall grant the supplier the time and opportunity required to do so. Should the customer refuse this, the supplier shall be exempted from the liability for defects.
- (6) If the post-performance fails, the customer - notwithstanding possible claims for damages - may withdraw from the contract or reduce the compensation. The customer may not claim compensation for futile expenses.
- (7) Claims for defects do not exist in case of minor deviations from the agreed or assumed quality, minor impairment of usability, natural wear or damages incurred after passing of the risk because of incorrect or negligible handling, excessive use, unsuitable operating material, faulty construction work, unsuitable subsoil or because of special external influences which are not established in the contract as well as in case of non-reproducible software errors. If the customer or third parties perform improper modifications or repair work, no claims for defects will exist for these and the resulting consequences.
- (8) The supplier shall not bear the additional expenditure, in particular transport, travelling, labour and material costs, which result from the fact that the subject matter of the delivery was later transported to a different location than the customer's branch or the original place of destination, except the transport corresponds to its proper use.
- (9) In all cases, the customer shall be obliged to take any possible and reasonable steps to keep the expense for the purpose of postperformance as small as possible. The supplier shall participate in the costs for a recall campaign only if this is necessary based on the factual and legal situation. The customer shall be obliged to either return defective products or keep them ready for inspection and tests, in the supplier's discretion.
- (10) Claims for recourse of the customer against the supplier shall only exist to the extent the customer did not conclude any agreements with the customers' purchaser which exceed the statutory claims for defects. In addition, item 8.8 shall apply correspondingly to the scope of the right for recourse of the customer against the supplier.
- (11) Furthermore, item 11 (Other claims for damages) also applies to claims for damages. More extensive or other claims than stipulated in the present item 8 of the cus-

tommer against the supplier and its persons employed in performing the obligations because of a material defect shall be excluded.

### IX. Industrial property rights and copyright; defects of title

- (1) If not otherwise agreed upon, the supplier shall be obliged to render the delivery free of any industrial property rights and copyrights of third parties (hereinafter called: property rights) solely in the country of the place of delivery. To the extent a third party makes justified claims against the customer because of infringement of property rights by deliveries rendered by the supplier and used according to contract, the supplier shall be liable to the customer within the time-limit stipulated in item 8.2 as follows:
  - a) The supplier shall at the supplier's expense and in the supplier's discretion either obtain a right of use for the deliveries concerned, modify them such that the property right is not infringed or exchange them. Should the supplier not be able to do so under reasonable conditions, the customer shall be entitled to statutory cancellation or reduction rights. The customer may not claim compensation for futile expenses.
  - b) The supplier's obligation to pay damages shall be subject to item 11.
  - c) The above mentioned obligations of the supplier shall only be given provided the customer immediately informs the supplier in writing about claims asserted by third parties, refuses to acknowledge an infringement, and all and any measures of protection and settlement proceedings remain reserved to the supplier. Should the customer discontinue the use of the delivery goods for the purpose of reducing the damage or for other reasons, the customer shall be obliged to inform the third party about the fact that the discontinuance of use does not represent an acknowledgement of the property rights infringement.
- (2) Claims of the customer shall be excluded to the extent the customer is responsible for the property rights infringement.
- (3) Claims of the customer shall furthermore be excluded to the extent the property rights infringement was caused by special standards stipulated by the customer, by use not foreseeable by the supplier or by the fact that the delivery goods were modified by the customer or used in conjunction with products not delivered by the supplier.
- (4) In the event of property rights infringements, the claims of the customer stipulated in item 9.1 a) shall apply, in addition the provisions in item 8.4, item 8.5, and item 8.10 shall apply correspondingly. In case of other defects of title, the provisions of item 8 shall apply correspondingly.
- (5) More extensive or other claims than stipulated in the present item 9 of the customer against the supplier and its persons employed in performing the obligations because of a defect of title shall be excluded.

### X. Impossibility; adaptation of contract

- (1) To the extent the delivery is not possible, the customer shall be entitled to claim damages, except the impossibility is attributable to the supplier. The customer's claims for damages, however, shall be limited to 10% of the part of the delivery which cannot be taken into relevant operation because of the impossibility. This limitation shall not apply

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to the extent mandatory liability exists in cases of intent, gross negligence or personal injury; a shift of the burden of proof to the disadvantage of the customer is not given in this case. The customer's right to withdraw from the contract shall remain unaffected.

- (2) In case of temporary impossibility, item 5 (Time-limits) shall apply.
- (3) Should unforeseeable events in the sense of item 5.2 significantly change the economic meaning or the content of the delivery or have a significant effect on the supplier's operations, the contract shall be adapted in good faith. To the extent this is not economically reasonable, the supplier shall be entitled to withdraw from the contract. If the supplier intends to assert this right to withdraw, the supplier, after having obtained knowledge about the scope of the event, shall immediately inform the customer to this effect. This shall also apply if a prolongation of the delivery period was agreed upon with the customer at first.

### XI. Other claims for damages

- (1) Any claims for damages and reimbursement of expenses the purchaser may have due to the infringement of primary or collateral duties resulting from the relationship under the law of obligation, from unauthorized action or any other legal reasons, shall be excluded.
- (2) For all products with network connection, the risk of loss or data alteration and the risk of faulty data transmission will be passed to the customer as soon as the first network interface related to the product is crossed. For software products, the risk of loss or data alteration and the risk of faulty data transmission will be passed to the customer as soon as the software is installed. Despite careful control of the data, ProMinent does not assume any liability for data entering the system of the customer or other systems via an open network interface.
- (3) This exclusion does not apply when liability is imperative, e.g. according to the Product Liability Law (Produkthaftungsgesetz), for cases of intent, gross negligence or personal injuries, due to the warranty for the presence of a specific quality or the breach of material contractual obligations. Damage claims asserted on the basis of a breach of material contractual obligations shall be limited to foreseeable damages that are typical to the contract unless there is intent or gross negligence involved or the liability is based on physical injury or a warranty for the presence of a specific quality. No reversal of the burden of proof to the disadvantage of the purchaser is associated with the above provisions.
- (4) Unless longer limitation periods are imperatively prescribed by law, all claims for damages shall be subject to the limitation periods mentioned in sub-paragraph 8.2.

### XII. Warranty and product description

- (1) Warranties shall only be effective if made in writing.
- (2) Data described in catalogues, tender documentation and other printed matter as well as general advertising statements do not represent an offer for the conclusion of a warranty agreement.

### XIII. Reservation of title

- (1) The supplier reserves the title in the delivery goods (reserve goods) until the customer has made the complete payment due from the business relationship. The reservation of title shall also include the acknowledged

balance, to the extent the supplier enters the claims against the customer in current account (current account reserve).

- (2) If the supplier accepts return of the delivery goods, this shall mean a withdrawal from the contract. Upon return of the goods purchased, the supplier shall be entitled to realise these goods; the realisation proceeds shall be credited to the customer's obligations - minus reasonable realisation fees. In the event the delivery goods are attached, the supplier shall be entitled to withdraw from the contract without setting a time-limit. In case of attachment or other interventions by third parties, the customer shall immediately inform the supplier in writing for the supplier to be able to file action pursuant to §771 German Code of Civil Procedure. To the extent third parties are not able to reimburse the judicial and extrajudicial expenses of an action pursuant to §771 German Code of Civil Procedure to the supplier, the customer shall be liable for the loss incurred by the supplier
- (3) The customer shall be entitled to resell the delivery goods in the proper course of business; however, the customer already now assigns to the supplier all and any claims in the amount of the final invoice amount, including value added tax, which are due to him from the resale against his purchaser or third parties, independent of the fact whether the delivery goods were resold without or after processing. The customer shall be entitled to collect this claim also after its assignment. The supplier's power to collect the claim himself remains unaffected; the supplier, however, agrees not to collect the claim as long as the customer meets his payment obligations properly and is not delinquent. In this case, the supplier may request the customer to disclose the assigned claims and their debtors, to provide the information required for collection, to provide the relevant documentation and to inform the debtor (third party) about the assignment.
- (4) The processing and transformation of the delivery goods by the customer shall always be performed for the supplier. If the delivery goods are processed together with other objects not belonging to the supplier, the supplier shall obtain co-ownership in the new object in the proportion of the value of the delivery goods to the other processed objects at the time of processing. Otherwise, the same provisions as for reserve goods shall apply to the matter created by processing. The customer shall also assign to the supplier the claims for securing the supplier's claims which are due to the customer against a third party by joining the delivery goods with a real property.
- (5) If the delivery goods are mixed inseparably with other objects not belonging to the supplier, the supplier shall obtain coownership in the new object in the proportion of the value of the delivery goods to the other mixed objects at the time of mixing. If the mixing is done such that the matter of the customer is to be deemed a main component, the parties agree that the customer shall assign to the supplier proportional co-ownership. The customer shall keep the sole property or co-property for the supplier. The customer shall insure it in the usual scope against usual risks such as e.g. fire, theft, water, and similar. The customer shall already now assign to the supplier the customer's claims for compensation which are due to him from damages of the above mentioned type against insurers or other third parties, in the amount of the invoice value of the goods.
- (6) If the realisable value of the securities due to

the supplier exceed the supplier's total claims by more than 10%, the supplier shall be obliged to release in the supplier's discretion securities on request of the customer or a third party affected by the excessive security.

### XIV. Repair conditions

- (1) The orderer (customer) agrees through a legally binding declaration (Clearance) to subject the devices or parts which are meant for repair or maintenance to a thorough cleaning before shipment in order to exclude any hazard for the independent contractor by re-contaminations. The devices or parts shall thus be sent to the supplier free of any toxic, caustic, microbiologic, explosive, radioactive or other substances detrimental to health.
- (2) If a cost estimate is prepared on order of the orderer, the costs incurred in this connection may be charged to the orderer, independent of the fact whether a repair order is issued subsequently or not. Because the search time for defects is working time, the time expended and to be proven shall be charged to the orderer if an order cannot be executed because:
  - a) the defect complained about could not be determined, observing the rules of technology;
  - b) the order was withdrawn while executing the order;
- (3) The warranty period for all and any workmanship (repairs) as well as for built in material shall be six months. Otherwise, the warranty rules for suppliers and services from item VIII shall apply.
- (4) The payment terms from item IV shall apply. In addition, the following retention of title shall be agreed:
  - a) To the extent the replacement parts or similar built in during repairs do not become material components, the independent contractor shall reserve retention of title in these built in parts until the settlement of all and any claims of the independent contractor from the contract.
  - b) If the orderer delays in payment or does not meet the orderer's obligations from the retention of title, the supplier shall be entitled to request the return of the object for the purpose of removing the built in parts. All and any costs of the return and the removal shall be borne by the orderer.
  - c) If the repair is performed at the orderer's premises, the orderer shall give the supplier the opportunity to perform the removal at the orderer's premises. Labour and travel costs shall be at the expense of the orderer.
- (5) The place of jurisdiction for all disputes arising from this contract shall be the place of business of the contractor, if the person ordering is a merchant. However, the contractor is also entitled to institute legal proceedings at the place of business of the person ordering.

### XV. Place of jurisdiction and applicable law

- (1) The place of jurisdiction for all and any disputes arising out of the present contract shall be the supplier's headquarters, provided the customer is a merchant: The supplier, however, shall be entitled to file action at the customer's headquarters.
- (2) German law shall apply to the contractual relationships. The UN Convention on the In-

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ternational Sale of Goods (CISG) shall be excluded.

### XVI. Severability

Should any individual provisions of the present contract be legally ineffective, the validity of the remaining provisions shall in no way be affected. This shall not apply if abiding by the contract would constitute an unreasonable hardship for the other party to the contract.

### XVII. Terms and conditions for the participation in the exchange device pro-

#### gramme

- (1) The exchange device programme applies to pumps without Profibus interface and without self-ventilation as well as for amperometric sensors.
- (2) The purchaser agrees with the participation in the exchange device programme that the device is assigned to ProMinent Dosierertechnik GmbH. By delivering the device, the ownership in the delivered devices shall pass on to ProMinent Dosierertechnik. In return, the purchaser shall receive a used, similar and at least equal device.

- (3) Within the scope of each exchange process, a maximum of 5 exchange devices per customer may be ordered.
- (4) Already exchanged devices can no longer participate in the exchange device programme.
- (5) The warranty for exchange pumps shall be 6 months.

**ProMinent Dosierertechnik GmbH**

Valid 11/2007