



Resistance Guide

Drum and Container Pumps, Eccentric screw pumps



safety is our concern

Mediums table for eccentric screw pumps

Cosmetics products

Medium	Dynamic Viscosity*	Temperature
Shampoo	3000 mPas	20 °C
Liquid Soap	85 mPas	60 °C
Toothpaste	70000 mPas	40 °C
Hand Creme	780 mPas	20 °C

Vegetable oils / Animal oils

Medium	Dynamic Viscosity*	Temperature
Castor Oil	580 mPas	20 °C
Coconut Oil	60 mPas	20 °C
Corn Oil	30 mPas	60 °C
Cottonseed Oil	60 mPas	20 °C
Linseed Oil	30 mPas	40 °C
Olive Oil	40 mPas	40 °C
Palm Oil	45 mPas	40 °C
Peanut Oil	40 mPas	40 °C
Soya Oil	60 mPas	20 °C
Cod Liver Oil	35 mPas	40 °C
Pig Fat	65 mPas	40 °C

Dairy products

Medium	Dynamic Viscosity*	Temperature
Butter Fat	45 mPas	40 °C
Cheese Spread	30000 mPas	60 °C
Cocoa Butter	50 mPas	60 °C
Condensed Milk	80 mPas	40 °C
Cream (30 - 50 % fat content)	15-115 mPas	20 °C
Milk	2 mPas	20 °C
Whey	800-1500 mPas	40 °C
Yoghurt	150 mPas	40 °C
Liquid egg	150 mPas	45 °C

Mineral oil products

Medium	Dynamic Viscosity*	Temperature
Motor Oil SAE 5	30 mPas	20 °C
Motor Oil SAE 10	50 mPas	20 °C
Motor Oil SAE 15	130 mPas	20 °C
Motor Oil SAE 15W40	390 mPas	20 °C
Motor Oil SAE 15W40	3000 mPas	-15 °C
Motor Oil SAE 50	750 mPas	20 °C
Hydraulic Oil HLP 46	120 mPas	20 °C
Hydraulic Oil HLP 68	195 mPas	20 °C
Hydraulic Oil HLP 100	300 mPas	20 °C
Gear Oil SAE 90	700 mPas	20 °C
Gear Oil SAE 140	2700 mPas	20 °C

Foodstuffs

Medium	Dynamic Viscosity*	Temperature
Butter	30000 mPas	40 °C
Baby Food	1400 mPas	40 °C
Brewer's Yeast	370 mPas	20 °C
Vegetable Soup	430 mPas	20 °C
Chocolate Sauce	280 mPas	50 °C
Fruit Pulp	600 mPas	20 °C
Whipped Desserts	1500 mPas	40 °C
Gelatine	1200 mPas	45 °C
Glucose	4300-6800 mPas	25-30 °C
Gravy	110 mPas	80 °C
Jam	8500 mPas	20 °C
Malt Extract	9500 mPas	20 °C
Mayonnaise	2000 mPas	20 °C
Pectin	300 mPas	40 °C
Fruit Juice Concentrate	2500 mPas	20 °C
Pudding	1000 mPas	40 °C
Salad Dressing	1300-2600 mPas	20 °C
Apple Puré	1500 mPas	20 °C
Tomato Ketchup	1000 mPas	30 °C
Tomato Puré	195 mPas	20 °C
Honey	2000 mPas	40 °C

Industrial products

Medium	Dynamic Viscosity*	Temperature
Glycerine 100 %	650 mPas	20 °C
Lacquers (25 % pigments)	3000 mPas	20 °C
Polyester resin	3000 mPas	30 °C
Printing inks	550-2200 mPas	40 °C
Resin solution	7100 mPas	20 °C
Glycol	40 mPas	20 °C
Latex emulsion	200 mPas	20 °C
Paraffin emulsion	3000 mPas	20 °C
Liquid wax	500 mPas	90 °C
Cleaning emulsion	1500 mPas	70 °C

The liquids and their viscosities mentioned result from various practical applications. Other temperatures or compositions affect the viscosity and the flow properties of the several media.

Please contact us. We configure for your application the optimal pump model, which can be tested also locally.

*Products must still be fluid.

Find your way

1. General

This resistance table contains short statements about the chemical resistance of the various pump tube designs, accessories and pre-assembled Lutz pump sets for various liquids. These Lutz pump sets cover approx. 80% of the usual transfer tasks. The liquid-wetted materials used in the individual components were tested for their chemical resistance and evaluated for use at room temperature.

This resistance table is a guide that leads to statements about the suitability of the products and indicates which materials can be ruled out with certainty. If no suitable product can be found, it is recommended to consult Lutz in any case.

In case of unverifiable resistance or other concerns about the use of a certain material combination, we strongly recommend testing the units under operating conditions. We can provide material samples on request. It must be taken into account that discolourations on the surface, slight increases in weight and volume, as well as changes in the mechanical properties (elongation behaviour, strength values, etc.) do not always rule out the use of a material, taking into account the function.

Since the corrosion is influenced by various factors, the information cannot simply be applied to all operating conditions. Corrosion can be accelerated by increases in temperature, concentration of the liquid or, in the case of clean liquids, by the undesirable entry of water. Depending on the degree of contamination of the liquid, as well as the compounding process and degree of vulcanisation of the sealing materials, deviations are also possible with regard to the long-term resistance of the plastics and elastomers. The information given here applies without additional mechanical forces acting.

2. Instruction of use

The order of the liquids is based on the alphabetical order of the English names. Otherwise, concentration and density of the fluids are given, as far as useful and known.

The table is a very good guide at room temperature of the "attacking" fluid, as a large part of the processed information was often only available at 20 °C. The constantly advancing development in the field of plastics means that materials can be replaced or additionally used in our pumps after careful suitability testing. Therefore, future additions by other materials are to be expected. At the same time, we are continuously striving to close information gaps that have existed up to now.

All information in the resistance table is based on empirical values from industry. These were supplemented by results from our own tests. No guarantee claims can be derived from the information on the resistance of the products listed, as it only represents a non-binding guide to application. The certainty in selecting the right product is increased if the customer can contribute his experience with the aggressive substance in terms of material resistance.

Explanations to the column pump set:

In this column you will find the corresponding recommendations for our **Lutz pump sets**. The numbering has the following meaning:

„**Pump set no. x**“ without addition means general suitability of the set for the selected fluid.

„**Pump set no. x.1**“ without means general suitability of the set for the selected fluid. With this set, there is a risk of discolouration or embrittlement of the PVC hose depending on the exposure time.

Explanation of symbols:

- ✓ = resistant without restriction
- = conditionally resistant (risk of discolouration or embrittlement depending on exposure time)
- ⊗ = not specified
- = non resistant
- ① = Special seal EPDM
- ③ = Special seal FPM-FEP
- ③ = Special plain bearing Rulon (only pump tube SS 41-SL)
- ④ = Measuring chamber for nitric acid and hydrogen peroxide (H₂O₂) 30%
- cust. = customary
- pure = technically pure
- sat. = saturated

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.		
							PP		B50		PVDF		Alu		Stainless Steel		HC				
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*			
28	Ammonium Di-Hy-Phosphate	NH ₄ H ₂ PO ₄				1, 2, 3, 4, 5	PP-SS, RE-PP-SS	Container pump	B50 PP SS	PVDF	Alu	Alu	SS	B200 SS	SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	28
29	Ammonium Fluoride	NH ₄ F	14			5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									29
30	Ammonium Fluorosilicate	(NH ₄) ₂ SIF ₆	pure			-	MP-PP-HC	B1/B2 Battery HC		⊕	⊕	⊕									30
31	Ammonium Nitrate	NH ₄ NO ₃	10			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									31
32	Ammonium Nitrate	NH ₄ NO ₃	50	1.23		1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									32
33	Ammonium Nitrate	NH ₄ NO ₃	sat.			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									33
34	Ammonium Sulfate	(NH ₄) ₂ SO ₄	10			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									34
35	Ammonium Sulfate	(NH ₄) ₂ SO ₄	50	1.28		1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									35
36	Ammonium Sulfate	(NH ₄) ₂ SO ₄	sat.	1.3		1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									36
37	Ammonium Sulfide	(NH ₄) ₂ SO ₃	10			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									37
38	Amyl Acetate	CH ₃ CO ₂ C ₅ H ₁₁	pure	0.88	IIA	8, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									38
39	Amyl Alcohol	C ₅ H ₁₁ OH	pure	0.82	IIA	7, 8, 9, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									39
40	Amyl Chloride	CH ₃ (CH ₂) ₄ Cl	pure	0.87	IIA	8, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									40
41	Aniline	C ₆ H ₇ N	pure	1.01		-	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									41
42	Anone	C ₆ H ₁₀ O	pure	0.95	IIA	8, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									42
43	Antifreeze	HOCH ₂ CH ₂ OH	pure	1.11		5, 1, 1, 2, 1, 3, 1	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									43
44	Arsenic Acid	H ₃ AsO ₄	10			5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									44
45	Arsenic Acid	H ₃ AsO ₄	80			5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									45
46	Barium Chloride	BaCl ₂	10			1, 2, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									46
47	Barium Chloride	BaCl ₂	25	1.27		1, 2, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									47
48	Barium Hydroxide	Ba(OH) ₂	sat.			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									48
49	Benzaldehyde	C ₆ H ₅ CHO	0,1			5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									49
50	Benzaldehyde	C ₆ H ₅ CHO	pure	1.05		-	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									50
51	Benzene	C ₆ H ₆	pure	0.88	IIA	8, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									51
52	Benzoic Acid	C ₆ H ₅ COOH	10	1.27		1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									52
53	Benzyl Alcohol	C ₇ H ₈ O	pure	1.04	IIA	8, 10	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									53
54	Benzyl Chloride	C ₆ H ₅ CH ₂ Cl		1.11		-	PP-SS, MP-PP-SS	Container pump	B50 PP HC	PVDF	Alu	Alu									54

Meaning of symbols:
 ✓ = resistant
 ⊕ = Special seal FPM-FEP
 ⊙ = Special bearing Rulon (only pump tube SS-41-SL)
 cust. = customary
 ○ = conditionally stable
 ○ = non resistant
 ⊕ = Special seal EPDM
 ⊙ = Measuring chamber for Nitric Acid and Hydrogen Peroxide (H2O2) 30%
 pure = technical pure
 sat. = saturated
 ⊕ = not specified
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Explanation to the set-recommendation: Pump set no. 1 = PVC-Hose conditional stable (danger of discoloration and for embrittlement in dependence of the short-working period)
 *SL = Pump tube in sealless version / MS = Pump tube with mechanical seal

Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.
							PP		B50		PVDF		Alu		Stainless Steel		HC		
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	
55	Bitter Salt	MgSO ₄	10			1, 2, 3, 4, 5	PP-SS, RE-PP-SS	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	55			
56	Bitter Salt	MgSO ₄	sat.	1.28		1, 2, 3, 4, 5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	56			
57	Bleaching Solution	NaOCl	10			5	PP-SS, MP-PP-SS	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	57			
58	Bleaching Solution	NaOCl	12.5			5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	58			
59	Bleaching Solution	NaOCl	20			5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	59			
60	Borax	Na ₂ B ₄ O ₇	10			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	60			
61	Borax	Na ₂ B ₄ O ₇	sat.	1.03		1, 2, 3, 4, 5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	61			
62	Boric Acid	H ₃ BO ₃	10			1, 2, 3, 4, 5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	62			
63	Boric Acid	H ₃ BO ₃	sat.	1.01		1, 2, 3, 4, 5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	63			
64	Bromic Acid	HBrO ₃	10			-	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	64			
65	Bromine	Br ₂	pure	3.19		-	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	65			
66	Butane	C ₄ H ₁₀	50	0.58	IIA	7, 8, 9, 10	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	66			
67	Butane Diol	HO(CH ₂) ₄ OH	pure	1.01		5	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	67			
68	Butanol	C ₄ H ₉ OH	100	0.81	IIB	7, 8, 9, 10	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	68			
69	Butyl Acetate	CH ₃ CO ₂ (CH ₂) ₃ CH ₃	100	0.88	IIA	8, 10	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	69			
70	Butyl Alcohol	C ₄ H ₉ OH	100	0.81	IIB	7, 8, 9, 10	MP-PP-HC	Container pump B50 PP HC	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	70			
71	Butyl Chloride	CH ₃ (CH ₂) ₃ Cl	pure	0.89	IIA	-	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	71			
72	Butyl Glycol	HO(CH ₂) ₄ OH		0.9		-	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	72			
73	Butyl Phenol	C ₁₀ H ₁₄ O	pure			-	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	73			
74	Butyl Phthalate	C ₆ H ₄ (COOC ₄ H ₉) ₂	pure	1.05		-	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	74			
75	Butylene Glycol	C ₄ H ₁₀ O ₂	pure	1.01		5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	75			
76	Butyric Acid	CH ₃ (CH ₂) ₂ CO ₂ H	20	0.88		1, 1, 2, 1, 3, 1, 5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	76			
77	Butyric Acid	CH ₃ (CH ₂) ₂ CO ₂ H	pure	0.96		5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	77			
78	Calcium Chlorate	Ca(ClO ₃) ₂	10			5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	78			
79	Calcium Chloride	CaCl ₂	10			1, 2, 3, 4, 5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	79			
80	Calcium Chloride	CaCl ₂	sat.	1.4		1, 2, 3, 4, 5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	80			
81	Calcium Di-Hy. Sulphite	Ca(HSO ₃) ₂	10			1, 2, 3, 4, 5	MP-PP-SS	Container pump B50 PP SS	PVDF B1/B2 Battery PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	RE-SS	MP-SS	81			

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 pure = technical pure
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							PP		B50		PVDF		Alu		Stainless Steel		HC																
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*															
82	Calcium Di-Hy. Sulphite	Ca(HSO ₃) ₂	sat.			1, 2, 3, 4, 5	PP-SS, RE-PP-SS	MP-PP-SS	PP-SS, MP-PP-SS	B2 Vario PP, PP-HC	MP-PP-HC	PP-PP-HC	MP-PP-SS	B200 PVDF	Container pump	Container pump	B50 PP HC	B50 PP SS	PVDF	B2 Vario PVDF	B1/B2 Battery PVDF	Alu	Alu	SS	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	82		
83	Calcium Hypochlorite	Ca(ClO) ₂	10			5																											83
84	Calcium Nitrate	Ca(NO ₃) ₂	50	1.48		1, 2, 3, 4, 5, 6																											84
85	Camphor	C ₁₀ H ₁₆ O				-																											85
86	Caprylic Acid	CH ₃ (CH ₂) ₆ COOH				5																											86
87	Carbolic Acid	C ₆ H ₅ OH	50			-																											87
88	Carbolic Acid	C ₆ H ₅ OH	90	1.07		-																											88
89	Carbon Tetrachloride	CCl ₄	pure	1.59		5																											89
90	Carbonic Acid	H ₂ CO ₃				1, 2, 3, 4, 5																											90
91	Castor Oil	Mixture	cust.	0.96		5																											91
92	Caustic Potash	KOH	20	1.19		-																											92
93	Caustic Potash	KOH	30	1.29		-																											93
94	Caustic Potash	KOH	60	1.63		-																											94
95	Chloric Acid	HClO ₃	10			1, 2, 4, 5																											95
96	Chlorine Solution	NaOCl	10			5																											96
97	Chlorine Solution	NaOCl	12.5			5																											97
98	Chlorine Water	Cl ₂ /H ₂ O	sat.			5																											98
99	Chloroacetic Acid	ClCH ₂ COOH	85	1.36		-																											99
100	Chloroacetic Acid	ClCH ₂ COOH	98	1.36		-																											100
101	Chlorobenzene	C ₆ H ₅ Cl	pure	1.11	IIA	8, 10																											101
102	Chloroethane	CH ₃ CH ₂ Cl	pure	0.92		5																											102
103	Chloroform	CHCl ₃	100	1.48		-																											103
104	Chlorosulphonic Acid	HSO ₃ Cl	pure	1.77		-																											104
105	Chloroethene	Cl ₂ CH ₂	pure	1.34		5																											105
106	Chlorotoluene	C ₇ H ₇ Cl		1.11		-																											106
107	Chromic Acid	H ₂ CrO ₄	30			5																											107
108	Chromic Acid	H ₂ CrO ₄	50			5																											108

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.
							PP		B50		PVDF		Alu		Stainless Steel		HC		
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	
136	Diethylamine	(CH ₃) ₂ CH ₂ NH	10	0.7	IIA	8, 10	MP-PP-SS MP-PP-HC PP-SS, MP-PP-SS	B2 Vario PP, PP-HC MP-PP-HC B1/B2 Battery HC	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	SS B200 SS	B2 Vario SS (not Ex) SS B1/B2 Battery SS	MP-SS RE-SS	HC		
137	Diglycolic Acid	C ₄ H ₆ O ₅	30			1, 2, 3, 4, 5	✓	✓	-	-	✓	-	-	✓	✓	✓	✓		
138	Diglycolic Acid	C ₄ H ₆ O ₅	sat.			1, 2, 3, 4, 5	✓	✓	-	-	✓	-	-	✓	✓	✓	✓		
139	Dimethyl Benzene	C ₆ H ₄ (CH ₃) ₂	pure	0.86	IIA	-	-	-	-	-	-	-	-	✓	✓	✓	✓		
140	Dimethyl Formamide	HCON(CH ₃) ₂	pure	0.95		-	-	-	-	-	-	-	-	✓	✓	✓	✓		
141	Dimethylamine	C ₂ H ₇ N	pure	0.73		-	-	-	-	-	-	-	-	✓	✓	✓	✓		
142	Dioxane	C ₄ H ₈ O ₂	pure	1.03	IIB	8, 10	-	-	-	-	-	-	-	⊙	✓	✓	✓		
143	Ethanol	CH ₃ CH ₂ (OH)	pure	0.79	IIB	7, 8, 9, 10	-	-	-	-	-	-	-	⊙	✓	✓	✓		
144	Ether	(C ₂ H ₅) ₂ O	pure	0.71	IIB	-	-	-	-	-	-	-	-	-	✓	✓	✓		
145	Ethereal Oils	Mixture				-	-	-	-	-	-	-	-	-	✓	✓	✓		
146	Ethyl Acetate	CH ₃ COOCH ₂ CH ₃	pure	0.9	IIA	8, 10	-	-	-	-	-	-	-	-	✓	✓	✓		
147	Ethyl Acrylate	CH ₂ =CHCO ₂ CH ₂ CH ₃	pure		IIB	8, 10	-	-	-	-	-	-	-	-	✓	✓	✓		
148	Ethyl Alcohol	CH ₃ CH ₂ (OH)	pure	0.79	IIB	7, 8, 9, 10	-	-	-	-	-	-	-	⊙	✓	✓	✓		
149	Ethyl Benzene	CH ₃ CH ₂ -C ₆ H ₅	pure	0.87	IIB	8, 10	-	-	-	-	-	-	-	-	✓	✓	✓		
150	Ethyl Chloride	C ₂ H ₅ Cl	pure	0.92		5	-	-	-	-	✓	-	-	✓	✓	✓	✓		
151	Ethyl Glycol	HOCH ₂ CH ₂ OH	pure	0.93	IIB	7, 8, 9, 10	-	-	-	-	-	-	-	✓	✓	✓	✓		
152	Ethylene Chlorohydrin	ClCH ₂ CH ₂ OH	pure	1.2	IIA	8, 10	-	-	-	-	-	-	-	⊙	✓	✓	✓		
153	Ethylene Di- Bromide	Br(CH ₂) ₂ Br	pure	2.18		-	-	-	-	-	-	-	-	✓	✓	✓	✓		
154	Ethylene Diamine	(CH ₂) ₂ (NH ₂) ₂	pure	0.98	IIA	8, 10	-	-	-	-	-	-	-	⊙	✓	✓	✓		
155	Ethylene Dichloride	Cl(CH ₂) ₂ Cl	pure	1.26	IIA	8, 10	-	-	-	-	-	-	-	✓	✓	✓	✓		
156	Ethylene Glycol	(CH ₂ OH) ₂	pure	1.11		1, 1, 2, 1, 3, 1, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
157	Ethylene Oxide	(CH ₂) ₂ O	pure	0.89		-	-	-	-	-	-	-	-	-	✓	✓	✓		
158	Fatty Acids	C _n H _{2n+1} COOH	100	0.9		5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
159	Ferric(III)Chloride	FeCl ₃	50	1.55		1, 2, 4, 5	-	✓	✓	✓	✓	✓	✓	-	-	-	✓		
160	Ferric(III)Sulfate	Fe ₂ (SO ₄) ₃	50	1.61		1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
161	Ferrous(II)Chloride	FeCl ₂	10	1.09		1, 2, 4, 5	-	✓	✓	✓	✓	✓	✓	-	-	-	✓		
162	Ferrous(II)Chloride	FeCl ₂	50			1, 2, 4, 5	-	✓	✓	✓	✓	✓	✓	-	-	-	✓		

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 ⊙ = Special seal FPM-FEP
 cust. = customary
 ○ = conditionally stable
 ⊕ = Special bearing Rulon (only pump tube SS-41-SL)
 pure = technical pure
 sat. = saturated
 ⊗ = not specified
 ⊕ = Measuring chamber for Nitric Acid and Hydrogen Peroxide (H2O2) 30%
 ⊙ = Special seal EPDM
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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.
							PP		B50		PVDF		Alu		Stainless Steel		HC		
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	
163	Ferrous(II)Nitrate	Fe(NO ₃) ₂	pure			1, 2, 3, 4, 5	PP-PP-SS	Container pump	B50 PP SS	PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	163		
164	Ferrous(II)Sulfate	FeSO ₄	20	1.21		1, 2, 3, 4, 5	MP-PP-HC	Container pump	B50 PP HC	PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	164		
165	Fish-Liver Oil	Mixture		0.98		5	PP-SS, MP-PP-SS	B2 Vario PP, PP-HC		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	165		
166	Formaldehyde	HCHO	10			1, 1, 2, 3, 1, 5	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	166		
167	Formaldehyde	HCHO	35			5	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	167		
168	Formaldehyde	HCHO	40			5	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	168		
169	Formamide	HCONH ₂	100			-	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	169		
170	Formic Acid	HCOOH	50			-	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	170		
171	Formic Acid	HCOOH	pure	1.22	IIA	8, 10	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	171		
172	Freon 12	Cl ₂ CF ₂	pure	1.32		-	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	172		
173	Fruit juices	Mixture	cust.			3	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	173		
174	Fuel Oil	Mixture	cust.			5, 6	MP-PP-HC	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	174		
175	Furfural	C ₅ H ₄ O ₂		1.16		-	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	175		
176	Furfuryl Alcohol	C ₅ H ₆ O ₂	pure	1.13		-	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	176		
177	Gallic Acid	C ₆ H ₃ (OH) ₃ COOH	50			1, 2, 3, 4, 5, 6	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	177		
178	Glauber's Salt	Na ₂ SO ₄	50	1.46		1, 2, 3, 4, 5, 6	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	178		
179	Gluconic Acid	C ₆ H ₁₂ O ₇				5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	179		
180	Glucose	C ₆ H ₁₂ O ₆	pure	1.13		1, 2, 3, 4, 5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	180		
181	Glycerine	C ₃ H ₈ O ₃	pure	1.26		5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	181		
182	Glycol	HOCH ₂ CH ₂ OH	pure	1.11		5, 1, 1, 2, 1, 3, 1	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	182		
183	Glycolic Acid	HOCH ₂ COOH	37			5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	183		
184	Glycolic Acid	HOCH ₂ COOH	70			5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	184		
185	Heptane	C ₇ H ₁₆	pure	0.68	IIA	7, 8, 9, 10	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	185		
186	Hexamethylene Tetramine	(CH ₂) ₆ N ₄	10			-	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	186		
187	Hexane	C ₆ H ₁₄	pure	0.66	IIA	7, 8, 9, 10	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	187		
188	Hexanol	CH ₃ (CH ₂) ₄ CH ₂ OH		0.83	IIA	7, 8, 9, 10	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	188		
189	Hydrazine	H ₂ NNH ₂	pure			5	MP-PP-SS	Container pump		PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	189		

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.											
							PP		B50		PVDF		Alu		Stainless Steel		HC													
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*												
190	Hydrobromic Acid	HBr	10	1.07	-	-	MP-PP-SS	MP-PP-HC	PP-SS, MP-PP-SS	B2 Vario PP, PP-HC	MP-PP-HC	B1/B2 Battery HC	Container pump	B50 PP HC	Container pump	B50 PP SS	PVDF	B200 PVDF	B1/B2 Battery PVDF	PVDF	Alu	Alu	SS	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	190
191	Hydrobromic Acid	HBr	48	1.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	191
192	Hydrochloric Acid	HCl	10		1, 2, 4, 5	1, 2, 4, 5	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	192	
193	Hydrochloric Acid	HCl	30		1, 2, 4, 5	1, 2, 4, 5	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	193	
194	Hydrochloric Acid	HCl	sat.	1.2	5	5	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	194	
195	Hydrocyanic Acid	HCN	pure	0.69	IIB	8, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	-	-	195	
196	Hydrofluoric Acid	HF	40	1.06	-	-	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	196	
197	Hydrofluoric Acid	HF	60		-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	197	
198	Hydrofluoric Acid	HF	70	1.23	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	198	
199	Hydrofluosilicic Acid	H ₂ SiF ₆	32		1, 2, 4, 5	1, 2, 4, 5	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	199	
200	Hydrogen Peroxide	H ₂ O ₂	3	1.01	1, 2, 3, 4, 5	1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	200	
201	Hydrogen Peroxide	H ₂ O ₂	10	1.04	1, 2, 3, 4, 5	1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	201	
202	Hydrogen Peroxide	H ₂ O ₂	20	1.07	1, 2, 3, 4, 5	1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	202	
203	Hydrogen Peroxide	H ₂ O ₂	30	1.11	1, 2, 3, 4, 5	1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	203	
204	Hydrogen Peroxide	H ₂ O ₂	90	1.42	5	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	204	
205	Hydroiodic Acid	IJ	pure		-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	205	
206	Hydrosilicofluoric Acid	H ₂ SiF ₆	32	1.17	1, 2, 4, 5	1, 2, 4, 5	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	206	
207	Ink	Mixture	cust.	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	207	
208	Iodine Tincture	Mixture	cust.		5	5	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	208	
209	Iodoform	CHI ₃				1, 2, 3, 4, 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	209	
210	Isobutyl Alcohol	C ₄ H ₉ CH ₂ OH	100	0.81	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	210	
211	Isooctane	C ₈ H ₁₈	pure	0.69	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	211	
212	Isooctanol	C ₈ H ₁₇ OH	pure	0.83		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	212	
213	Isopropanol	(CH ₃) ₂ CHOH	pure	0.78	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	213	
214	Isopropyl Acetate	CH ₃ COOCH(CH ₃) ₂		0.89	IIA	8, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	214	
215	Isopropyl Ether	(CH ₃) ₂ CHOCH(CH ₃) ₂	pure	0.73	IIA	8, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	215	
216	Kerosene	Mixture	pure	0.83	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	216	

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							PP		B50		PVDF		Alu		Stainless Steel		HC		
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	
217	Lactic Acid	CH ₃ CHOHCOOH	10			5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	217	
218	Lactic Acid	CH ₃ CHOHCOOH	90			5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	218	
219	Lanolin	Mixture	pure			5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	219	
220	Lead Acetate	Pb(CH ₃ CO ₂) ₂	10			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	220	
221	Lead Acetate	Pb(CH ₃ CO ₂) ₂	sat.			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	221	
222	Lead Nitrate	Pb(NO ₃) ₂	20	1.33		1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	222	
223	Lead Tetraethyl	(C ₂ H ₅) ₄ Pb	pure	1.66		1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	223	
224	Lime Milk	Ca(OH) ₂	15			-	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	224	
225	Linseed Oil	Mixture	pure			1, 2, 3, 4, 5, 6	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	225	
226	Lithium Chloride	LiCl	45	1.3		5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	226	
227	Lithium Sulfate	Li ₂ SO ₄	25	1.23		5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	227	
228	Magnesium Carbonate	MgCO ₃				1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	228	
229	Magnesium Chloride	MgCl ₂	10			1, 2, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	229	
230	Magnesium Chloride	MgCl ₂	sat.			1, 2, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	230	
231	Magnesium Nitrate	Mg(NO ₃) ₂	25	1.21		3	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	231	
232	Magnesium Sulfate	MgSO ₄	10			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	232	
233	Magnesium Sulfate	MgSO ₄	sat.	1.28		1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	233	
234	Maleic Acid	(CHCOOH) ₂	35			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	234	
235	Maleic Acid	(CHCOOH) ₂	sat.			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	235	
236	Malic Acid	(HO ₂ C)CH ₂ CHOH	50			5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	236	
237	Manganese(II) Chloride	MnCl ₂	20	1.19		5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	237	
238	Mercuric(I) Nitrate	Hg ₂ (NO ₃) ₂	sat.			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	238	
239	Mercuric(II) Cyanide	Hg(CN) ₂	pure			1, 2, 3, 4, 5	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	239	
240	Methanol	CH ₃ OH	pure	0.79	IIA	7, 8, 9, 10	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	240	
241	Methyl Acetate	CH ₃ CO ₂ CH ₃	100	0.93	IIA	8, 10	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	241	
242	Methyl Benzene	C ₆ H ₅ CH ₃	100	0.87	IIA	8, 10	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	242	
243	Methyl Cyanide	CH ₃ CN		0.78	IIA	8, 10	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	243	

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.										
							PP		B50		PVDF		Alu		Stainless Steel		HC												
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*											
244	Methyl Ethyl Ketone	CH ₃ COCH ₂ CH ₃	100	0.81	IIB	8, 10	PP-SS, RE-PP-SS	MP-PP-SS	PP-SS, MP-PP-SS	B2 Vario PP, PP-HC	MP-PP-HC	Container pump	B50 PP HC	Container pump	B50 PP SS	PVDF	B200 PVDF	B1/B2 Battery PVDF	Alu	Alu	SS	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	244	
245	Methyl Glycol	CH ₃ OCH ₂ CH ₂ OH		0.98	IIB	7, 8, 9, 10																							245
246	Methyl Isobutyl Ketone	CH ₃ CH(CH ₃)CH ₂ COCH ₃		0.8	IIA	8, 10																							246
247	Methyl Pentanone	CH ₃ CH(CH ₃)CH ₂ COCH ₃		0.8	IIA	8, 10																							247
248	Methylene Chloride	CH ₂ Cl ₂	100	1.33																									248
249	Milk	Mixture	cust.																										249
250	Mineral Oils	Mixture				6																							250
251	Mineral Oils	Mixture		1.01	IIA	8, 10																							251
252	Mineral Water	H ₂ O				1, 2, 3, 4, 5, 6																							252
253	Nail Polish Remover	CH ₃ COCH ₃	10		IIA	8, 10																							253
254	Nail Polish Remover	CH ₃ COCH ₃	pure	0.79	IIA	8, 10																							254
255	Naphtha	Mixture																											255
256	Naphthalene	C ₁₀ H ₈		1.15		5																							256
257	Naphthenic Acid	Mixture	100	0.9		5																							257
258	Nickel Chloride	NiCl ₂	20	1.22		1, 2, 4, 5																							258
259	Nickel Nitrate	Ni(NO ₃) ₆ H ₂ O	35	1.38		1, 2, 3, 4, 5																							259
260	Nickel Sulfate	NiSO ₄	10	1.21		1, 2, 3, 4, 5																							260
261	Nitric Acid	HNO ₃	10	1.05		5																							261
262	Nitric Acid	HNO ₃	30	1.18																									262
263	Nitric Acid	HNO ₃	50	1.31		5																							263
264	Nitric Acid	HNO ₃	65	1.41		5																							264
265	Nitric Acid	HNO ₃	-	1.5		5																							265
266	Nitrobenzene	C ₆ H ₅ NO ₂	pure	1.21																									266
267	Nitrotoluene	C ₇ H ₇ NO ₂	pure																										267
268	Octane	C ₈ H ₁₈	pure	0.7	IIA	7, 8, 9, 10																							268
269	Oleic Acid	C ₁₈ H ₃₄ O ₂	pure	0.9		5																							269
270	Oleum	H ₂ SO ₄ /SO ₃				5																							270

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.
							PP		B50		PVDF		Alu		Stainless Steel		HC		
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	
271	Oxalic Acid	(COOH) ₂	10			1, 2, 3, 4, 5	PP-SS, RE-PP-SS	Container pump B50 PP HC	B200 PVDF	Alu	B200 SS	Alu	B200 SS	RE-SS	HC	271			
272	Oxalic Acid	(COOH) ₂	sat.	1.65		1, 2, 4, 5	MP-PP-HC	Container pump B50 PP HC	B1/B2 Battery PVDF	-	-	-	-	-	MP-SS	272			
273	Paraffin Oil	Mixture	pure			1, 2, 3, 4, 5, 6	PP-SS, MP-PP-SS	Container pump B2 Vario PP, PP-HC	B2 Vario PVDF	Alu	-	Alu	-	-	-	273			
274	Peanut Oil	Mixture				-	MP-PP-HC	Container pump B1/B2 Battery HC	-	Alu	-	Alu	-	-	-	274			
275	Pentanol-1	CH ₃ (CH ₂) ₃ CH ₂ OH	pure	0.82	IIA	7, 8, 9, 10	-	-	-	-	⊕	-	-	-	-	275			
276	Pentyl Acetate	CH ₃ (CH ₂) ₃ CH ₂ COOCH ₃	pure	0.88	IIA	8, 10	-	-	-	-	-	-	-	-	-	276			
277	Perchloric Acid	HClO ₄	20			1.1, 2.1, 5	-	-	MP-PP-HC	-	-	-	-	-	-	277			
278	Perchloric Acid	HClO ₄	50			5	-	-	MP-PP-HC	-	-	-	-	-	-	278			
279	Perchloric Acid	HClO ₄	70			5	-	-	MP-PP-HC	-	-	-	-	-	-	279			
280	Perchloric Acid	HClO ₄	sat.	1.55		-	-	-	-	-	-	-	-	-	-	280			
281	Perchloroethylene	C ₂ Cl ₄	pure			5	-	-	-	-	-	-	-	-	-	281			
282	Petrol	C ₅ H ₁₂ -C ₁₂ H ₂₆	pure	0.73	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	282			
283	Petroleum	Mixture	pure	0.83	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	283			
284	Petroleum Ether	Mixture	pure	0.69	IIA	7, 8, 9, 10	-	-	-	-	-	-	-	-	-	284			
285	Phenol	C ₆ H ₅ OH	50			-	-	-	-	-	-	Alu	-	-	-	285			
286	Phenol	C ₆ H ₅ OH	90	1.07		-	-	-	-	-	-	Alu	-	-	-	286			
287	Phosphoric Acid	H ₃ PO ₄	30	1.18		1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	287			
288	Phosphoric Acid	H ₃ PO ₄	50			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	288			
289	Phosphoric Acid	H ₃ PO ₄	85			5	PP-SS, MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	289			
290	Phosphoric Acid	H ₃ PO ₄	95	1.66		-	-	-	-	-	-	-	-	-	-	290			
291	Phosphorous Oxichloride	POCl ₃	pure	1.57		5	MP-PP-HC	Container pump B2 Vario PP, PP-HC	B2 Vario PVDF	-	-	-	-	-	-	291			
292	Phosphorous Trichloride	PCl ₃	pure	1.57		5	MP-PP-HC	Container pump B2 Vario PP, PP-HC	B2 Vario PVDF	-	-	-	-	-	-	292			
293	Photographic Developer	Mixture	cust.			1, 2, 3, 4, 5	PP-SS, MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	293			
294	Phthalic Acid	C ₈ H ₆ O ₄	50			3, 4, 5	PP-SS, RE-PP-SS	Container pump B50 PP HC	B1/B2 Battery PVDF	Alu	⊕	Alu	⊕	-	-	294			
295	Phthalic Acid	C ₈ H ₆ O ₄	sat.	1.59		3, 4, 5	MP-PP-HC	Container pump B50 PP HC	B1/B2 Battery PVDF	Alu	⊕	Alu	⊕	-	-	295			
296	Picric Acid	(NO ₂) ₃ C ₆ H ₂ OH	50			5	MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	296			
297	Pine Oil	Mixture				-	MP-PP-SS	Container pump B50 PP HC	B200 PVDF	-	-	-	-	-	-	297			

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Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.						
							PP		B50		PVDF		Alu		Stainless Steel		HC								
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*							
325	Potassium Permanganate	KMnO ₄	6	1.04		5	MP-PP-SS MP-PP-HC PP-SS, MP-PP-SS B2 Vario PP, PP-HC MP-PP-HC B1/B2 Battery HC	Container pump B50 PP HC	Container pump B50 PP SS	PVDF B200 PVDF	Alu	Alu	B2 Vario PVDF B1/B2 Battery PVDF	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	325	
326	Potassium Permanganate	KMnO ₄	18			5																			326
327	Potassium Sulfate	K ₂ SO ₄	10	1.08		1, 2, 3, 4, 5, 6																			327
328	Propanol	C ₃ H ₇ OH	100	0.8	IIB	7, 8, 9, 10																			328
329	Propionic Acid	CH ₃ CH ₂ COOH	50		IIA	8, 10																			329
330	Propionic Acid	CH ₃ CH ₂ COOH	pure	0.99	IIA	8, 10																			330
331	Propylene Glycol	C ₃ H ₈ (OH) ₂	pure	1.04		1, 2, 3, 4, 5, 6																			331
332	Propylene Oxide	C ₃ H ₆ O	pure	0.83	IIB	8, 10																			332
333	Pyrogallol	C ₆ H ₃ (OH) ₃	10			5																			333
334	Salad Oil	Mixture	cust.			1, 2, 3, 4, 5, 6																			334
335	Salicylic Acid	C ₆ H ₄ OHCOOH	50	1.48		5																			335
336	Sea Water	H ₂ O				1, 2, 4, 5																			336
337	Silicic Acid	Si(OH) ₄	pure			1, 2, 3, 4, 5																			337
338	Silicone Oil	(R ₂ SiO) _x	pure			1, 2, 3, 4, 5, 6																			338
339	Silver Nitrate	AgNO ₃	8	1.07		1, 2, 3, 4, 5																			339
340	Soap Solution	Mixture				1, 2, 3, 4, 5																			340
341	Sodium Acetate	CH ₃ COONa	10			5																			341
342	Sodium Aluminate	Na ₂ Al ₂ O ₄				1, 2, 3, 4, 5																			342
343	Sodium Benzoate	C ₆ H ₅ NaO ₂	36			5																			343
344	Sodium Benzoate	C ₆ H ₅ NaO ₂	sat.			5																			344
345	Sodium Bicarbonate	NaHCO ₃	10	1.07		1, 2, 3, 4, 5, 6																			345
346	Sodium Carbonate	Na ₂ CO ₃	25	1.27		1, 2, 3, 4, 5																			346
347	Sodium Chlorate	NaClO ₃	25	1.23		1, 2, 3, 4, 5																			347
348	Sodium Chloride	NaCl	20			1, 2, 4, 5																			348
349	Sodium Dichromate	Na ₂ Cr ₂ O ₇	10			5																			349
350	Sodium Fluoride	NaF	4	1.04		1, 2, 3, 4, 5																			350
351	Sodium Hydrogen Sulphate	NaHSO ₄	50	1.16		1, 2, 3, 4, 5																			351

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Drum and Container Pumps

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							PP		B50		PVDF		Alu		Stainless Steel		HC															
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*														
352	Sodium Hydrogen Sulphite	NaHSO ₃				1, 2, 3, 4, 5, 6	MP-PP-SS	PP-SS, RE-PP-SS	MP-PP-HC	PP-PP-HC	MP-PP-SS	B2 Vario PP, PP-HC	B1/B2 Battery HC	Container pump	B50 PP HC	Container pump	B50 PP SS	PVDF	B200 PVDF	B1/B2 Battery PVDF	PVDF	Alu	Alu	SS	B200 SS	SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	352
353	Sodium Hydroxide	NaOH	10	1.16		3	⊙		⊙			⊙		⊙					⊙													353
354	Sodium Hydroxide	NaOH	30	1.33		3	⊙		⊙			⊙		⊙					⊙													354
355	Sodium Hydroxide	NaOH	50	1.53		3,1	⊙		⊙			⊙		⊙					⊙													355
356	Sodium Hypochlorite	NaClO	10			5	-		-			-		-					✓													356
357	Sodium Hypochlorite	NaClO	12,5			5	-		-			-		-					✓													357
358	Sodium Hypochlorite	NaClO	20			5	-		-			-		-					✓													358
359	Sodium Nitrate	NaNO ₃	45	1.37		1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													359
360	Sodium Nitrite	NaNO ₂	50			1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													360
361	Sodium Perchlorate	NaClO ₄	25	1.18		-	-		-			-		-					-													361
362	Sodium Phosphate	Na ₃ PO ₄	10			1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													362
363	Sodium Silicate	2Na ₂ OxSiO ₂	20	1.24		1, 2, 3, 4, 5	✓		✓			✓		✓					✓													363
364	Sodium Sulfate	Na ₂ SO ₄	50	1.46		1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													364
365	Sodium Sulfide	Na ₂ S	16	1.16		1, 2, 3, 4, 5	✓		✓			✓		✓					✓													365
366	Sodium Sulfite	Na ₂ SO ₃	sat.	1.18		1, 2, 3, 4, 5	✓		✓			✓		✓					✓													366
367	Sodium Thiosulfate	Na ₂ S ₂ O ₃	40			1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													367
368	Solvent Naphtha	Mixture		0.72	IIA	7, 8, 9, 10	-		-			-		-					-													368
369	Spindle Oil	Mixture	pure			5	✓		✓			✓		✓					✓													369
370	Stearic Acid	CH ₃ (CH ₂) ₁₆ CO ₂ H	100	0.94		1, 2, 3, 4, 5, 6	✓		✓			✓		✓					✓													370
371	Styrol	C ₆ H ₅ -CH=CH ₂	pure	0.91	IIA	8, 10	-		-			-		-					-													371
372	Succinic Acid	C ₄ H ₆ O ₄	50	1.06		1, 2, 3, 4, 5	✓		✓			✓		✓					✓													372
373	Sulphite Liquor	Ca(HSO ₃) ₂	10			1, 2, 3, 4, 5	✓		✓			✓		✓					✓													373
374	Sulphite Liquor	Ca(HSO ₃) ₂	sat.			1, 2, 3, 4, 5	✓		✓			✓		✓					✓													374
375	Sulphur Chloride	S ₂ Cl ₂	10	1.69		5	-		-			-		-					-													375
376	Sulphur Ether	(C ₂ H ₅) ₂ O	pure	0.71	IIB	-	-		-			-		-					-													376
377	Sulphuric Acid	H ₂ SO ₄	40	1.3		1, 2, 4, 5	-		-			-		-					-													377
378	Sulphuric Acid	H ₂ SO ₄	80	1.66		5	✓		✓			✓		✓					✓													378

Meaning of symbols:
 ✓ = resistant
 ⊙ = Special seal FPM-FEP
 cust. = customary
 ○ = conditionally stable
 ○ = non resistant
 ⊙ = Special bearing Rulon (only pump tube SS-41-SL)
 pure = technical pure
 sat. = saturated
 ⊗ = not specified
 ○ = Special seal EPDM
 ⊙ = Measuring chamber for Nitric Acid and Hydrogen Peroxide (H2O2) 30%
 Explanation to the set-recommendation: Pump set no. 1 = PVC-Hose conditional stable (danger of discoloration and for embrittlement in dependence of the short-working period)
 *SL = Pump tube in sealless version / MS = Pump tube with mechanical seal

Drum and Container Pumps

No.	Medium	Formula	Concentration in %	Spec. gravity kg/dm ³	Explosion Group	Suitable Pump set No.	Pump Tubes												No.											
							PP		B50		PVDF		Alu		Stainless Steel		HC													
							MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*	MS*	SL*												
379	Sulphuric Acid	H ₂ SO ₄	90	1.73		5	PP-SS, RE-PP-SS	MP-PP-SS	PP-SS, MP-PP-SS	B2 Vario PP, PP-HC	MP-PP-HC	B1/B2 Battery HC	Container pump	B50 PP HC	Container pump	B50 PP SS	PVDF	B200 PVDF	B1/B2 Battery PVDF	PVDF	Alu	Alu	B200 SS	B2 Vario SS (not Ex)	B1/B2 Battery SS	RE-SS	MP-SS	HC	379	
380	Sulphuric Acid	H ₂ SO ₄	98	1.84		5																								380
381	Sulphurous Acid	H ₂ SO ₃	50			1, 2, 3, 4, 5																								381
382	Table Salt	NaCl	25			1, 2, 4, 5																								382
383	Tannic Acid	H ₁₆ H ₁₂ O ₄₆	50			1, 2, 3, 4, 5																								383
384	Tanning Extracts, vegetable	Mixture	cust.			1, 2, 3, 4, 5, 6																								384
385	Tartaric Acid	C ₄ H ₆ O ₆	sat.	1.76		5																								385
386	Tetrachloroethane	Cl ₂ CHCHCl ₂	pure	1.6		-																								386
387	Tetrachloromethane	CCl ₄	pure	1.59		5																								387
388	Tetrahydrofuran	C ₄ H ₈ O	pure	0.89	IIB	8, 10																								388
389	Tetralin	C ₁₀ H ₁₂	100	0.97		-																								389
390	Thionyl Chloride	SOCl ₂	pure	1.66		-																								390
391	Thiophene	C ₄ H ₄ S	pure	1.06	IIA	8, 10																								391
392	Tin(II)Chloride	SnCl ₂	20	1.17		1, 2, 4, 5																								392
393	Toluene	C ₇ H ₈	100	0.87	IIA	8, 10																								393
394	Transformer Oil	Mixture	pure			-																								394
395	Tributyl Phosphate	(C ₄ H ₉) ₃ PO ₄	pure	0.98		-																								395
396	Trichloroacetic Acid	CCl ₃ COOH	50			-																								396
397	Trichloroacetic Acid	CCl ₃ COOH	pure	1.62		-																								397
398	Trichlorobenzene	C ₆ H ₃ Cl ₃		1.69		-																								398
399	Trichloroethane	C ₂ H ₃ Cl ₃	pure	1.48		5																								399
400	Trichloroethylene	C ₂ HCl ₃	50			5																								400
401	Trichloroethylene	C ₂ HCl ₃	pure	1.46		5																								401
402	Trichlorofluoromethane	CFCl ₃	pure	1.32		-																								402
403	Trichloromethane	CHCl ₃	100	1.48		-																								403
404	Tricresyl Phosphate	(CH ₃ C ₆ H ₄ O) ₃ PO	pure	1.13		-																								404
405	Triethylamine	(CH ₃ CH ₂) ₃ N	pure	0.73	IIA	7, 8, 9, 10																								405

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Lutz Pumpen GmbH

Erlenstraße 5-7 | D-97877 Wertheim | Telefon 0 93 42 / 8 79-0 | info@lutz-pumpen.de | www.lutz-pumpen.de