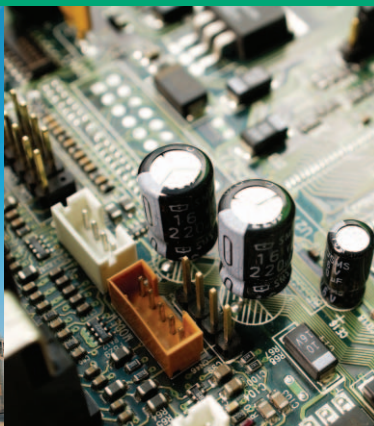




Pumpen Intelligenz.

Magnet Driven Pumps

PM-015NM	PM-403PI/PN	PM-015NE	PM-403PG
PM-030PM	PM-753PI/PN	PM-030PE	PM-753PG
PM-051NM	PM-1503PI/PN	PM-051NE	PM-1503PG
PM-052PM	PM-2203PI/PN	PM-052PE	PM-2203PG
	PM-3703PI/PN		PM-3703PG
PM-101PM	PM-403FI/FN	PM-101PE	PM-403FG
PM-150PM	PM-753FI/FN	PM-150PE	PM-753FG
PM-250PMS	PM-1503FI/FN	PM-250PES	PM-1503FG
PM-250PMH	PM-2203FI/FN	PM-250PEH	PM-2203FG
PM-250PIS	PM-3703FI/FN		PM-3703FG
PM-250PIH		PM-300PE	
PM-300PM			





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Pumpen Intelligenz.

Intelligent pumping system and Total solution

We make the Clean life / We make the Clean World
We move the Water / We move the World



Pumpen Intelligenz.



Contents_

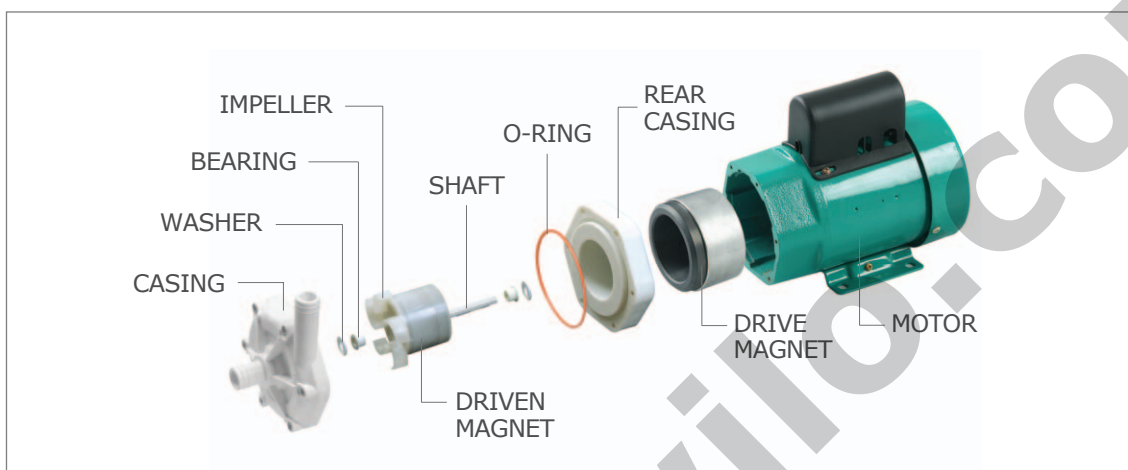
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Dimensions	11
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No-Leakage Sealless Pump

Small Size Model

Since the pump has no power transmission shaft, it has no shaft sealing parts such as mechanical seals and gland packing at all. The hermetically sealed pumping chamber is absolutely free from leakage of the liquid handled to the outside.



Applications and Features

Small Size Model

NORYL Products	P.P (PolyPropylene) Products
PM-015NM, -051NM PM-015NE, -051NE	PM-030PM, -052PM, -101PM, -150PM, -250PM/I, -300PM PM-030PE, -052PE, -101PE, -150PE, -250PE, -300PE
<ul style="list-style-type: none"> · For hot water circulation · Hot water supplying for solar system or heat tank · General water circulation 	<ul style="list-style-type: none"> · Corrosive chemical solutions, acids and alkalis · Photograph developing solutions, fixers, bleaching solutions and inks · Etching apparatus for electronic parts, and photochemical processes · Dyeing equipment and waste liquid treating units

• Chemical Resistance and Reliability

Highly chemical resistant polypropylene, fluororubber and ceramics are standard materials for wetted parts. These offer a wider range of pump applications.

• High Efficiency with Compact Size

The pumps are logically designed to compact sizes to offer exceptionally high efficiency. All pumps are ideally suited for building into various kinds of apparatus and machinery.

• Pumping Hot Water (PM-015NM, -051NM, -015NE, -051NE)

The pumps are designed to deliver hot water of 90°C using noryl plastic parts.

• Maintenance-Free

The simple design coupled with the absence of any sealing parts make maintenance and inspection the simplicity itself. So durable, the pumps withstand sustained continuous operation.

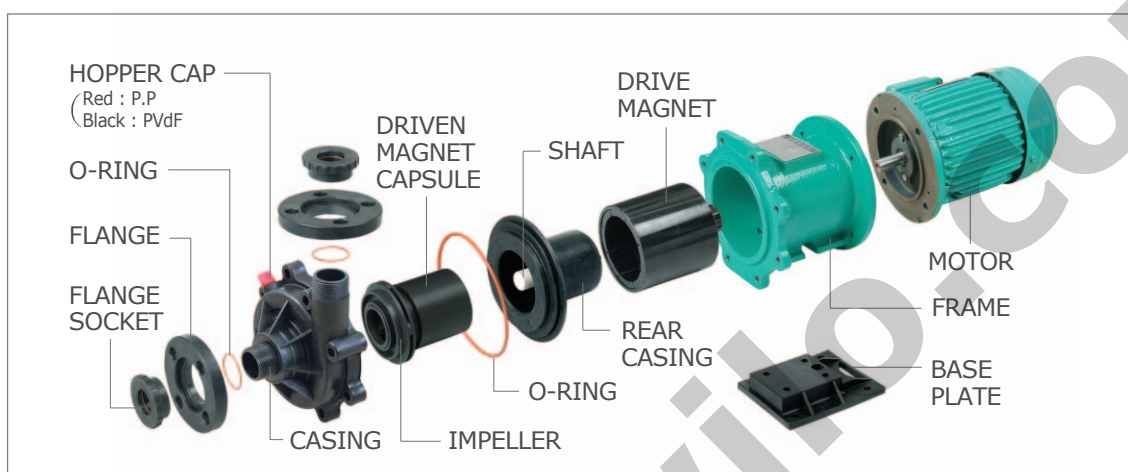
CONSTRUCTION & FEATURES

WILO

No-Leakage Sealless Pump

Large Size Model

Since the pump has no power transmission shaft, it has no shaft sealing parts such as mechanical seals and gland packing at all. The hermetically sealed pumping chamber is absolutely free from leakage of the liquid handled to the outside.



Applications and Features

Large Size Model

P.P (PolyPropylene) Products

PM-403PI/PN/PG, -753PI/PN/PG,
PM-1503PI/PN/PG, -2203PI/PN/PG, -3703PI/PN/PG

PVdF(Poly Vinylidene Fluoride) Products

PM-403FI/FN/FG, -753FI/FN/FG,
PM-1503FI/FN/FG, -2203FI/FN/FG, -3703FI/FN/FG

- Corrosive chemical solutions, acids and alkalis
- Photograph developing solutions, fixers, bleaching solutions and inks
- Drugs, chemicals, and cosmetics
- Etching apparatus for electronic parts, and photochemical processes
- Dyeing equipment and waste liquid treating units
- Laboratories, test rooms and test plants

• Chemical Resistance and Reliability

Highly chemical resistant polypropylene, poly vinylidene fluoride, fluororubber and ceramics are standard materials for wetted parts. These offer a wider range of pump applications.

• High Efficiency with Compact Size

The pumps are logically designed to compact sizes to offer exceptionally high efficiency. All pumps are ideally suited for building into various kinds of apparatus and machinery. The pumps apply standard motors.

• Maintenance-Free

The simple design coupled with the absence of any sealing parts make maintenance and inspection the simplicity itself. So durable, the pumps withstand sustained continuous operation.



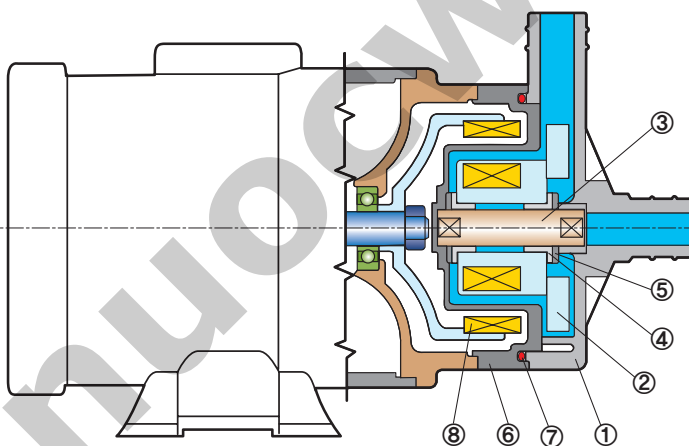
MODEL CODE & MATERIALS

Small Size Model Code Identification

PM - 25 0 P M H
 ① ② ③ ④ ⑤ ⑥

① PM	② 25	③ 0	④ P	⑤ M	⑥ H
Model	Output	Serial	Main Material	Power Source	Piping Type
Magnet Driven Pump	01 ×10 : 15W 05 ×10 : 50W 10 ×10 : 100W 15 ×10 : 150W 25 ×10 : 250W 30 ×10 : 300W	Serial Number	P : PolyPropylene N : Noryl	M : 1~ 220V 60Hz I : 3~ 220/380V 60Hz E : 1~ 220V 50Hz G : 3~ 220/380V 50Hz	H : HOSE S : SCREW : HOSE

Sectional View and Materials of Parts



No	Parts	Models	
		PM-015NM, PM-051NM PM-015NE, PM-051NE	PM-030PM, 052PM, 101PM, 150PM, 250PM/I, 300PM PM-030PE, 052PE, 101PE, 150PE, 250PE, 300PE
1	CASING	NORYL	P.P (PolyPropylene)
2	IMPELLER UNIT	NORYL	P.P (PolyPropylene)
3	SHAFT	CERAMIC	
4	BEARING	CARBON	TEFLON
5	BEARING WASHER	CERAMIC	
6	REAR CASING	NORYL	P.P (PolyPropylene)
7	O-RING	EPDM	VITON
8	MAGNET	FERRITE	

MODEL CODE & MATERIALS

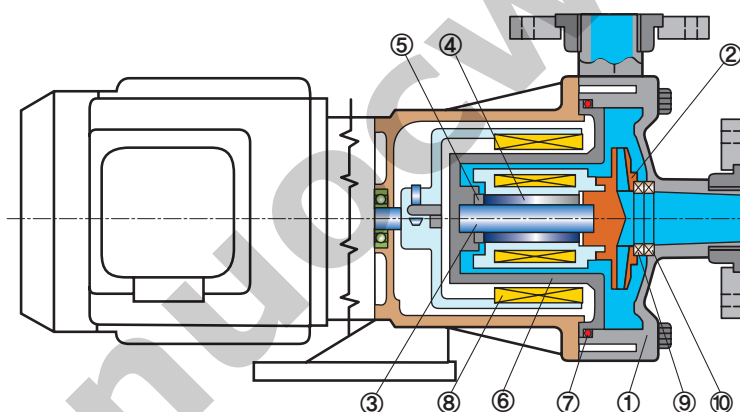


Large Size Model Code Identification

PM - 150 3 P I
 ① ② ③ ④ ⑤

① PM	② 150	③ 3	④ P	⑤ I
Model	Output	Serial	Main Material	Power Source
Magnet Driven Pump	40 × 10 : 370W 75 × 10 : 750W 150 × 10 : 1,500W 220 × 10 : 2,200W 370 × 10 : 3,700W	Serial Number	P : PolyPropylene F : PVdF	I : 3~ 220/380V 60Hz N : 3~ 440V 60Hz G : 3~ 220/380V 50Hz

Sectional View and Materials of Parts



No.	Parts	Models			
		PM-403PI/PN/PG PM-753PI/PN/PG	PM-1503PI/PN/PG PM-2203PI/PN/PG PM-3703PI/PN/PG	PM-403FI/FN/FG PM-753FI/FN/FG	PM-1503FI/FN/FG PM-2203FI/FN/FG PM-3703FI/FN/FG
1	CASING	P.P (PolyPropylene)		PVdF (Poly Vinylidene Fluoride)	
2	IMPELLER UNIT	P.P (PolyPropylene)		PVdF (Poly Vinylidene Fluoride)	
3	SHAFT	CERAMIC			
4	BEARING	TEFLON			
5	BEARING WASHER	CERAMIC			
6	REAR CASING	P.P (PolyPropylene)		PVdF (Poly Vinylidene Fluoride)	
7	O-RING	VITON			
8	MAGNET	FERRITE	NFB	FERRITE	NFB
9	THRUST BEARING	TEFLON			
10	THRUST BEARING	CERAMIC			

Small Size Model Specifications

60Hz

Item Model	Power Source	Output	Input	Hmax	Qmax	Rated Flow	Piping	Max Temp	Main Material
PM-015NM	1 ϕ 220V 60Hz	15W	39W	4.5m	19 ℓ /min	7 ℓ /min (Ht=4m)	14mm Hose	90°C	NORYL
PM-030PM		30W	55W	3.5m	28 ℓ /min	20 ℓ /min (Ht=2m)	17mm Hose	60°C	P.P
PM-051NM		50W	125W	10m	15 ℓ /min	10 ℓ /min (Ht=5m)	19mm Hose	90°C	NORYL
PM-052PM			120W	5.5m	40 ℓ /min	25 ℓ /min (Ht=2.5m)	20mm Hose		
PM-101PM		100W	210W	6.5m	65 ℓ /min	35 ℓ /min (Ht=4m)	20mm Hose	60°C	P.P
PM-150PM		150W	250W	8m	70 ℓ /min	45 ℓ /min (Ht=4m)			
PM-250PMS		250W	410W	8m	110 ℓ /min	75 ℓ /min (Ht=5m)	25mm(1 ") Screw		
PM-250PMH							26mm Hose		
PM-300PM		300W	460W	12m	130 ℓ /min	70 ℓ /min (Ht=9m)	26mm Hose		
PM-250PIH		3 ϕ 220/ 380V 60Hz	250W	410W	8m	110 ℓ /min	75 ℓ /min (Ht=5m)		
PM-250PIS									

Large Size Model Specifications

60Hz

Item Model	Power Source	Output	Input	Hmax	Qmax	Rated Flow	Piping(Flange type)	Max Temp	Main Material
PM-403PI/PN	I : 3 ϕ 220/ 380V 60Hz N : 3 ϕ 440V 60Hz	370W	530W	9m	250 ℓ /min	100 ℓ /min (Ht=8m)	Inlet: 40mm(1 1/2 ")	P.P : 60°C PVdF : 80°C	P.P
PM-403FI/FN									PVdF
PM-753PI/PN		750W	990W	16m	350 ℓ /min	180 ℓ /min (Ht=12m)	Outlet: 40mm(1 1/2 ")		P.P
PM-753FI/FN									PVdF
PM-1503PI/PN		1,500W	2,000W	25m	450 ℓ /min	230 ℓ /min (Ht=20m)	Inlet: 50mm(2 ")		P.P
PM-1503FI/FN									PVdF
PM-2203PI/PN		2,200W	2,700W	30m	480 ℓ /min	300 ℓ /min (Ht=20m)	Outlet: 40mm(1 1/2 ")		PVdF
PM-2203FI/FN									PVdF
PM-3703PI/PN		3,700W	3,000W	35m	580 ℓ /min	300 ℓ /min (Ht=25m)	Inlet: 50mm(2 ") Outlet: 50mm(2 ")		P.P
PM-3703FI/FN									PVdF

SPECIFICATIONS



Small Size Model Specifications

50Hz

Item Model	Power Source	Output	Input	Hmax	Qmax	Rated Flow	Piping	Max Temp	Main Material
PM-015NE	1 ϕ 220V 50Hz	15W	30W	3.5m	12 ℓ /min	7 ℓ /min (Ht=2.5m)	14mm Hose	90 $^{\circ}$ C	NORYL
PM-030PE		30W	40W	2.5m	22 ℓ /min	15 ℓ /min (Ht=1.5m)	17mm Hose	60 $^{\circ}$ C	P.P
PM-051NE		50W	95W	8m	15 ℓ /min	11 ℓ /min (Ht=4m)	19mm Hose	90 $^{\circ}$ C	NORYL
PM-052PE			95W	4m	35 ℓ /min	25 ℓ /min (Ht=2.5m)	20mm Hose	60 $^{\circ}$ C	P.P
PM-101PE		100W	150W	4.5m	50 ℓ /min	20 ℓ /min (Ht=4m)	20mm Hose		
PM-150PE		150W	230W	5.5m	60 ℓ /min	30 ℓ /min (Ht=4m)			
PM-250PES		250W	350W	6.0m	90 ℓ /min	50 ℓ /min (Ht=4m)	25mm(1") Screw		
PM-250PEH							26mm Hose		
PM-300PE		300W	390W	7.5m	95 ℓ /min	65 ℓ /min (Ht=4m)	26mm Hose		

Large Size Model Specifications

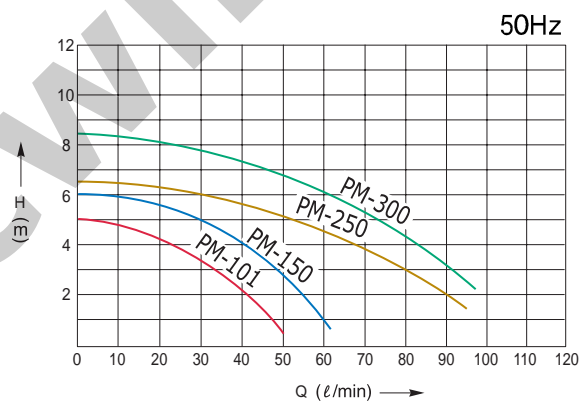
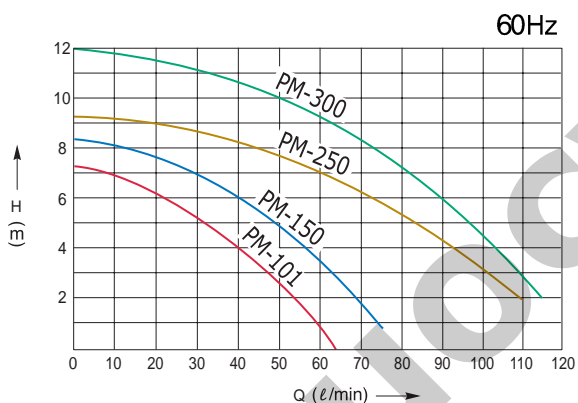
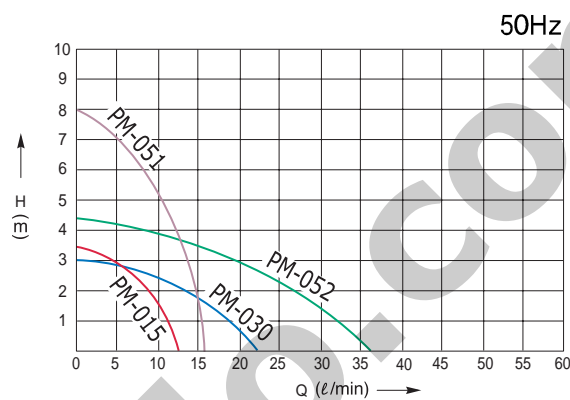
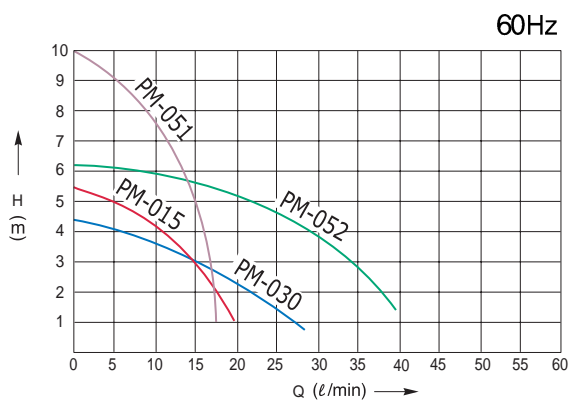
50Hz

Item Model	Power Source	Output	Input	Hmax	Qmax	Rated Flow	Piping(Flange type)	Max Temp	Main Material
PM-403PG	3 ϕ 220/ 380V 50Hz	370W	380W	11m	250 ℓ /min	150 ℓ /min (Ht=7m)	Inlet: 40mm(1 1/2")	P.P : 60 $^{\circ}$ C	P.P
PM-403FG									PVdF
PM-753PG		750W	760W	16m	300 ℓ /min	180 ℓ /min (Ht=10m)	Outlet: 40mm(1 1/2")		P.P
PM-753FG									PVdF
PM-1503PG		1,500W	1,550W	22m	370 ℓ /min	250 ℓ /min (Ht=15m)	Inlet: 50mm(2")	PVdF : 80 $^{\circ}$ C	P.P
PM-1503FG									PVdF
PM-2203PG		2,200W	1,670W	23m	420 ℓ /min	250 ℓ /min (Ht=18m)	Outlet: 40mm(1 1/2")		P.P
PM-2203FG									PVdF
PM-3703PG		3,700W	2,770W	24m	550 ℓ /min	300 ℓ /min (Ht=20m)	Inlet: 50mm(2") Outlet: 50mm(2")	P.P	
PM-3703FG								PVdF	

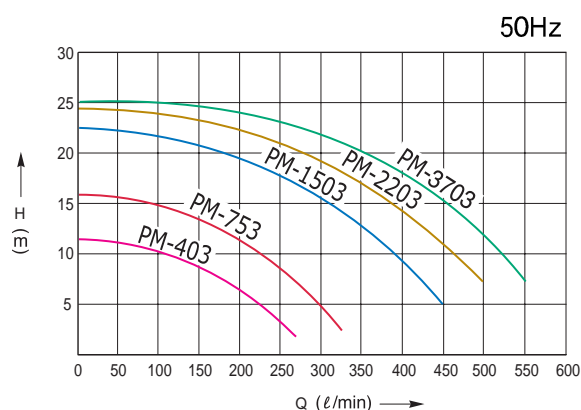
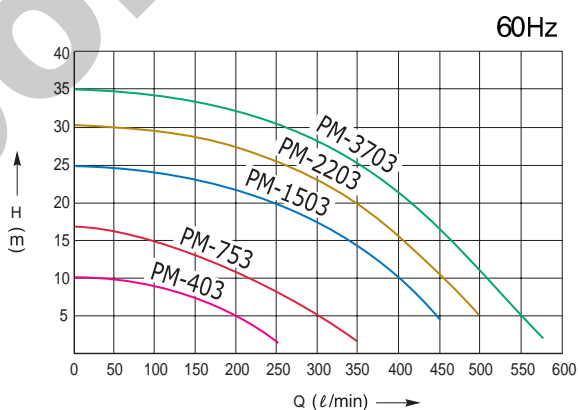


PERFORMANCE CURVES

Small Size Model Performance Curves



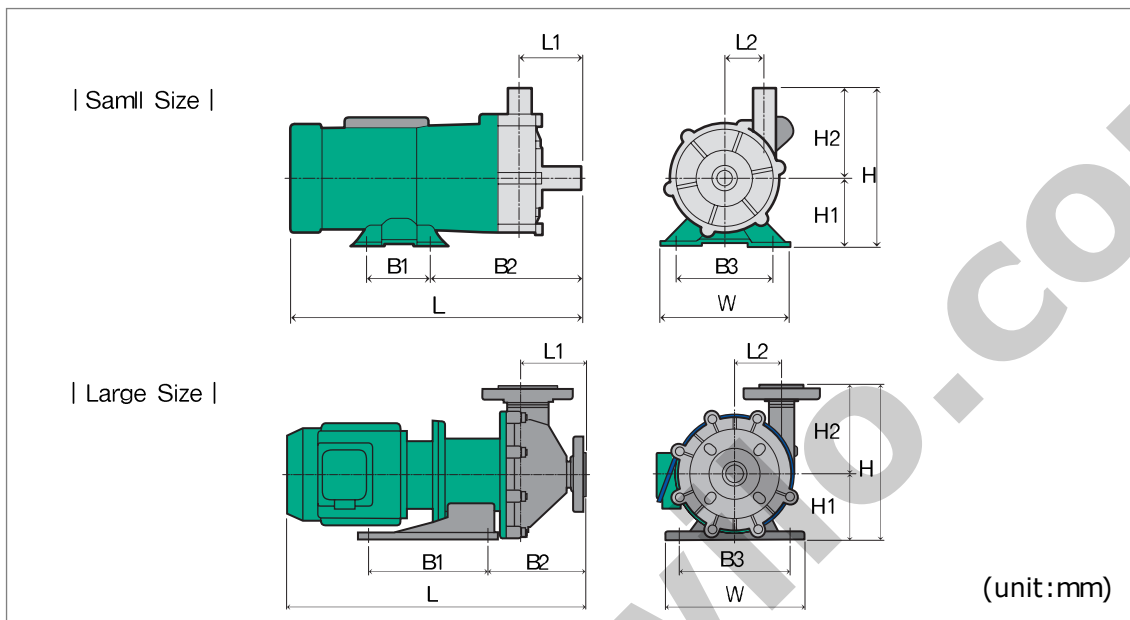
Large Size Model Performance Curves



DIMENSIONS



Out Dimensions



Items Models	H	H1	H2	L	L1	L2	B1	B2	B3	W	Piping		Weight (kg)
											Suc.	Disch.	
PM-015NM/NE	112	56	56	192	30	26	44	95	95	106	14mm Hose		2.1
PM-030PM/PE	118	56	62	200	38	25	44	103	95	106	17mm Hose		2.2
PM-051NM/NE	157	62	95	245	40	44	44	118	94	108	19mm Hose		3.5
PM-052PM/PE	130	60	70	255	48	31	40	149	100	120	20mm Hose		3.5
PM-101PM/PE	153	68	85	275	48	50	70	143	86	112	20mm Hose		6.8
PM-150PM/PE													
PM-250PMH/PEH	166	71	95	373	73	47	90	219	99	144	25mm Hose		10.0
PM-250PIH/PGH													
PM-250PIS	166	71	95	373	73	47	90	219	99	144	25mm (1") Screw		10.0
PM-250PMS													
PM-300PM/PE	171	71	100	363	65	44	90	211	99	144	25mm Hose		11.0

Items Models	H	H1	H2	L	L1	L2	B1	B2	B3	W	Piping		Weight (kg)
											Suc.	Disch.	
PM-403PI/PN/FG	235	110	125	470	86	52	98	140	110	140	40mm (1 1/2")	40mm (1 1/2")	20.5
PM-403FI/FN/FG													
PM-753PI/PN/FG	255	115	140	525	90	66	130	165	130	160	50mm (2")	40mm (1 1/2")	31.5
PM-753FI/FN/FG													
PM-1503PI/PN/FG	275	115	160	620	100	66	200	165	210	260	50mm (2")	40mm (1 1/2")	41.0
PM-1503FI/FN/FG													
PM-2203PI/PN/FG													43.5
PM-2203FI/FN/FG													
PM-3703PI/PN/PG	315	165	150	685	100	66	90	180	200	240	50mm (2")	50mm (2")	70.0
PM-3703FI/FN/FG													



CHEMICAL RESISTANCE LIST

The data has been taken from the relevant manufacturer's documentation and our own tests. Resistance of materials is also dependant on other factors, e.g. operating 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 technical documentation on the application.

- PVC Poly Vinyl Chloride
- PP Poly Propylene
- PVdF Poly Vinylidene Fluoride
- FPM Fluoro Polypropylene Copolymer
- EPDM Ethylene Propylene Copolymer
- PTFE Poly Tetra Fluoro Ethylene

- MARKS
- ◎ ... Excellent
- ... Good
- △ ... Fair
- X ... Not Recomend

Chemicals	Concentration (%)	Temperature (°C)	Material																
			P	P	P	S	S	F	E	P	P	P							
			V	V	d	3	3	0	1	P	P	T	F						
			4	6	M	M	E												

Chemicals	Concentration (%)	Temperature (°C)	Material																
			P	P	P	S	S	F	E	P	P	P							
			V	V	d	3	3	0	1	P	P	T	F						
			4	6	M	M	E												

		Acids									
H ₂ SO ₄ Sulfuric Acid	60	40	◎	◎	◎	X	X	◎	◎	◎	◎
		60	X	○	◎	X	X	◎	○	◎	◎
		80	X	△	◎	X	X	○	X	◎	◎
	90	20	○	◎	◎	◎	◎	◎	◎	◎	◎
		40	○	◎	◎	△	◎	◎	△	◎	◎
		60	X	○	◎	X	△	◎	X	◎	◎
HNO ₃ Nitric Acid	25	20	◎	◎	◎	◎	◎	◎	X	◎	◎
		40	◎	◎	◎	◎	◎	◎	X	◎	◎
		60	X	○	◎	◎	◎	◎	X	◎	◎
	50	20	○	◎	◎	◎	◎	◎	X	◎	◎
		40	○	◎	◎	◎	◎	◎	△	X	◎
		60	X	X	○	◎	◎	◎	X	X	◎
75	20	○	X	◎	◎	◎	X	X	◎	◎	
	40	△	X	◎	△	◎	X	X	◎	◎	
	80	△	X	◎	△	◎	X	X	◎	◎	
HCl Hydrochloric Acid	15	40	◎	◎	◎	X	X	◎	◎	◎	◎
		60	X	◎	◎	X	X	○	◎	◎	◎
		80	X	○	◎	X	X	○	◎	◎	◎
	25	40	◎	◎	◎	X	X	◎	◎	◎	◎
		60	X	◎	◎	X	X	X	○	◎	◎
		80	X	○	◎	X	X	X	X	◎	◎
35	20	◎	◎	◎	X	X	○	◎	◎	◎	
	40	○	◎	◎	X	X	X	X	◎	◎	
	60	X	○	◎	X	X	X	X	○	◎	
CrO ₃ Chromic Acid	10	40	◎	X	◎	X	X	○	X	◎	◎
		80	X	X	◎	X	X	X	X	◎	◎
		20	◎	X	◎	X	X	○	X	◎	◎
	50	40	○	X	◎	X	X	○	X	◎	◎
		80	X	X	◎	X	X	X	X	◎	◎
		60	X	X	◎	X	X	X	X	◎	◎
HOOC-COOH Oxalic Acid	20	40	◎	◎	◎	X	X	◎	◎	◎	◎
		80	X	○	◎	X	X	○	◎	◎	◎
		40	◎	◎	◎	X	X	◎	◎	◎	◎
	50	60	X	◎	◎	X	X	◎	◎	◎	◎
		80	X	○	◎	X	X	○	◎	◎	◎
		60	X	◎	◎	X	X	◎	◎	◎	◎

		Acids									
H ₃ PO ₄ Phosphoric Acid	25	20	◎	◎	◎	◎	◎	◎	◎	◎	◎
		40	◎	◎	◎	△	◎	◎	◎	◎	◎
		80	X	○	◎	X	○	◎	◎	◎	◎
	50	20	◎	◎	◎	◎	◎	◎	◎	◎	◎
		40	◎	◎	◎	△	◎	◎	◎	◎	◎
		80	X	△	◎	X	◎	◎	◎	◎	◎
HF Hydrofluoric Acid	10	20	◎	◎	◎	X	X	◎	◎	◎	◎
		40	△	△	◎	X	X	◎	◎	◎	◎
		80	X	X	◎	X	X	◎	△	◎	◎
	25	20	○	◎	◎	X	X	◎	◎	◎	◎
		40	△	△	◎	X	X	◎	◎	◎	◎
		80	X	X	◎	X	X	◎	X	◎	◎
55	40	X	X	◎	X	X	◎	X	◎	◎	
	80	X	X	◎	X	X	◎	X	◎	◎	
	40	◎	◎	◎	X	X	X	◎	◎	◎	
HCOOH Formic Acid	40	40	○	◎	◎	X	X	X	◎	◎	◎
		80	X	X	◎	X	X	X	◎	◎	◎
		20	○	◎	◎	X	X	X	◎	◎	◎
	90	40	X	X	◎	X	X	X	◎	◎	◎
		60	X	X	◎	X	X	X	◎	◎	◎
		80	X	X	○	X	X	X	◎	◎	◎
HClO ₄ Perchloric Acid	10	20	◎	◎	◎	X	X	X	X	◎	◎
		40	○	X	◎	X	X	X	X	◎	◎
		80	X	X	○	X	X	X	X	◎	◎
CH(OH)COOH CH(OH)COOH Tartaric Acid	20	40	◎	◎	◎	X	X	X	◎	◎	◎
		40	○	◎	◎	X	X	X	◎	◎	◎
		60	X	△	◎	X	X	X	◎	◎	◎
	80	40	X	X	◎	X	X	X	X	◎	◎
		60	X	X	◎	X	X	X	X	◎	◎
		80	X	X	◎	X	X	X	X	◎	◎

Chemicals	Material		P V d S 3 0 4	P V d S 3 1 6	F P M	E P D M	P T F E	
	Temperature	Concentration						
								(°C)
	Acids							
CH ₃ COOH Acetic Acid	10	40	⊙	⊙	△	X	⊙	
		80	X	X	○	△	X	⊙
	25	40	○	○	⊙	△	X	⊙
		80	X	X	○	X	X	⊙
	50	40	△	△	⊙	△	X	⊙
		80	X	X	○	X	X	⊙
H ₂ SiF ₇ Silicofluoric Acid (Fluosilic Acid)	30	20	⊙	⊙	⊙	X	⊙	
		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	X	⊙
	50	40	○	○	⊙	X	X	⊙
		60	X	○	⊙	X	X	⊙
		80	X	○	⊙	X	X	⊙
HClO Hypochlorous Acid	10	40	⊙	○	⊙	X	⊙	
		80	X	X	○	X	X	⊙
HOC(CH ₂ COOH) ₂ CO Citric Acid	10	20	⊙	⊙	⊙	⊙	⊙	
		40	○	○	⊙	⊙	⊙	
		80	X	X	○	⊙	⊙	
C ₆ H ₃ (NO ₂) ₃ OH Picric Acid	10	40	⊙	⊙	⊙	X	⊙	
		60	X	○	⊙	X	○	
		80	X	○	⊙	X	△	⊙
H ₃ BO ₃ boric Acid		40	⊙	⊙	⊙	X	⊙	
		60	X	○	⊙	X	○	
		80	X	○	⊙	X	○	
H ₂ CO ₃ Carbonic Acid		20	⊙	⊙	⊙	X	⊙	
		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	⊙	
		80	X	○	⊙	X	⊙	
CH ₃ CH(OH)COOH Lactic Acid		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	○	
		80	X	X	○	X	X	
ClCH ₂ COOH Monochloracetic Acid		20	○	○	⊙	X	○	
		40	○	○	⊙	X	X	
		80	X	X	○	X	X	
C ₆ H ₅ COOH Benzoic Acid		20	○	○	⊙	X	⊙	
		40	○	△	⊙	X	X	
		80	X	X	○	X	X	
CH ₃ (CH ₂) ₁₇ COOH Stearic Acid		40	○	○	⊙	X	○	
		80	X	△	⊙	X	X	
C ₂ H ₂ (CH ₂) ₈ COOH Oleic Acid		20	○	○	⊙	X	⊙	
		60	X	○	⊙	X	⊙	
		80	X	○	⊙	X	⊙	
(CHCOO) ₂ Maleic Acid		20	○	○	⊙	X	⊙	
		40	○	○	⊙	X	○	
		60	X	○	⊙	X	○	
RCOOH Fatty Acid		40	○	○	⊙	X	⊙	
		80	X	X	○	X	○	
H ₂ SO ₃ Sulfurous Acid		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	○	
		80	X	○	⊙	X	△	
HBF ₄ Borofluoric Acid		20	○	○	⊙	X	⊙	
		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	○	
H ₂ S Hydroiodic Sulfide		40	○	○	⊙	X	⊙	
		60	X	○	⊙	X	⊙	
		80	X	○	⊙	X	○	
HI Hydroiodic Acid		20	○	○	⊙	X	⊙	
		60	X	X	○	X	X	
		80	X	X	○	X	X	
HBr Hydrobromic Acid		20	○	○	⊙	X	⊙	
		40	○	○	⊙	X	X	
		80	X	○	⊙	X	X	
H ₃ AsO ₄ Arsenic Acid		20	○	○	⊙	X	⊙	
		40	△	○	⊙	X	○	
		60	X	△	⊙	X	○	

Chemicals	Material		P V d S 3 0 4	P V d S 3 1 6	F P M	E P D M	P T F E
	Temperature	Concentration					
	Acids						
Cl ₂ Ag Chlorine Water		20	○	○	⊙	X	⊙
		40	△	△	⊙	X	X
		80	X	X	○	X	X
HCl+HNO ₃ Aquaregia		20	△	X	⊙	X	○
		40	X	X	⊙	X	△
		80	X	X	⊙	X	X
HOOCCH ₃ CH(OH)COOH Malic Acid		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	X	○	X	X
H ₂ O ₂ Hydrogen Peroxide	5	20	○	○	⊙	X	○
		40	○	○	⊙	X	○
		60	X	○	⊙	X	△
	50	20	△	X	⊙	X	○
		40	X	X	○	X	X
		80	X	X	○	X	X
Alkalis							
NaOH Caustic Soda	20	20	○	○	⊙	X	○
		40	○	○	⊙	X	○
		60	X	○	△	⊙	X
	50	20	○	○	⊙	X	○
		40	X	○	△	⊙	X
		60	X	○	X	○	X
KOH Caustic Potash	25	20	○	○	⊙	X	○
		40	○	○	⊙	X	○
		60	X	○	△	⊙	X
NH ₄ OH Ammonia Water		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	○
Salts							
KClO Potassium Hypochlorite		40	X	X	○	X	○
		80	X	X	△	X	○
NaClO Sodium Hypochlorite	5	20	○	○	⊙	X	○
		40	○	○	⊙	X	△
		60	X	○	△	X	X
	13	20	○	○	⊙	X	○
		40	○	○	⊙	X	○
		60	X	△	X	X	X
Na ₂ SO ₃ Sodium Sulfite		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	X
K ₂ SO ₃ Potassium Sulfite		40	○	○	⊙	X	○
		80	X	○	⊙	X	X
NaHSO ₄ Sodium Bisulfite		40	○	○	⊙	X	○
		80	X	○	⊙	X	○
NaHSO ₄ Sodium Bisulfate		40	○	○	⊙	X	○
		80	X	○	⊙	X	○
Na ₂ S ₂ O ₃ Sodium Thiosulfate		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	○
NaClO ₂ Sodium Chlorite		20	○	X	⊙	X	○
		60	X	X	△	X	X
		80	X	X	○	X	X
Na ₃ PO ₄ Sodium Phosphate		20	○	○	⊙	X	○
		40	X	○	⊙	X	○
		60	X	○	⊙	X	○
Na ₂ SiO ₃ Sodium Silicate		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	○
Na ₂ CO ₃ Sodium Carbonate		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	○
CaCl ₂ Calcium Chloride		40	○	○	⊙	X	○
		60	X	○	⊙	X	○
		80	X	○	⊙	X	○

Chemicals	Material	Concentration (%)	Temperature (°C)	P	P	P	S	S	F	E	P
				V	V	V	S	S	P	P	T
				C	P	d	3	3	M	M	F
Salts											
NaHCO ₃ Sodium Bicarbonate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	⊙	⊙	X	X	⊙	⊙	⊙
NH ₄ Cl Ammonium Chloride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
KCl Potassium Chloride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
AlCl ₃ Aluminium Chloride			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
(NH ₄) ₂ CO ₃ Ammonium Carbonate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	⊙	⊙	X	X	⊙	⊙	⊙
K ₃ Cu(CN) ₄ Potassium Coppercyanide			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	⊙	⊙	X	X	⊙	⊙	⊙
K ₂ Cr ₂ O ₇ Potassium Dichromate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	X	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
Al ₂ (SO ₄) ₃ Aluminium Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	⊙	⊙	X	X	X	X	⊙
MgCl ₂ Magnesium Chloride			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
Na ₂ S Sodium Sulfate			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
FeSO ₄ Ferrous Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	X	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
Ti ₂ (SO ₄) ₃ Titanic Sulfate			40	⊙	⊙	⊙	X	X	X	X	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
Ti ₂ (SO ₄) ₂ Titanic Sulfate			20	⊙	⊙	⊙	X	X	X	X	⊙
			40	⊙	⊙	⊙	X	X	X	X	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
CuSO ₄ Copper Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
ZnSO ₄ Zinc Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
ZnCl ₂ Zinc Chloride			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
Na ₃ AlF ₆ Cryolite			40	⊙	⊙	⊙	X	X	X	X	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
(NH ₄) ₃ PO ₄ Ammonium Phosphate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
(NH ₄) ₂ SO ₄ Ammonium Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
NH ₄ NO ₃ Ammonium Nitrate			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
HgCl ₂ Mercuric Chloride			40	X	⊙	⊙	X	X	X	X	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
CuBF ₄ Copper Borofluoride			40	X	X	⊙	X	X	X	X	⊙
			60	X	X	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙

Chemicals	Material	Concentration (%)	Temperature (°C)	P	P	P	S	S	F	E	P
				V	V	V	S	S	P	P	T
				C	P	d	3	3	M	M	F
Salts											
NiCl ₂ Nickel Chloride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
K ₂ SO ₄ Potassium Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
K ₂ SO ₄ Al ₂ (SO ₄) ₃ Potassium Alum			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
AlF ₃ Aluminium Fluoride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
NaCl Sodium Chloride			40	⊙	⊙	⊙	X	⊙	⊙	⊙	⊙
			60	X	⊙	⊙	⊙	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
SnCl ₂ Stannous Chloride			40	⊙	⊙	⊙	X	X	X	⊙	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
SnCl ₄ Stannic Chloride			40	⊙	⊙	⊙	X	X	X	⊙	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
CuCl ₂ Cupric Chloride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
FeCl ₃ Ferric Chloride			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	⊙	⊙	X	X	⊙	⊙	⊙
MgSO ₄ Magnesium Sulfate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
NiSO ₄ Nickel Sulfate			40	X	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
NaCN Sodium Cyanide			40	⊙	X	⊙	X	X	⊙	⊙	⊙
			60	X	X	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
KMnO ₄ Potassium Permanganate			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	X	X	⊙
KClO ₃ Potassium Chlorate			20	⊙	X	⊙	X	X	X	⊙	⊙
			40	⊙	X	⊙	X	X	X	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
KI Potassium Iodide			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	X	⊙
			80	X	X	⊙	X	X	X	X	⊙
AgNO ₃ Silver Nitrate			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	X	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	X	X	⊙
CO ₂ Carbon Dioxide			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	X	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	⊙	⊙
BaCl ₂ (3H ₂ O) Barium Chloride			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	X	⊙
Organic Chemicals											
CH ₃ OH Methyl Alcohol		100	20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	X	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
C ₂ H ₅ OH Ethyl Alcohol			20	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
C ₃ H ₇ OH Propyl Alcohol			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	X	⊙
C ₄ H ₉ OH Butyl Alcohol			40	⊙	⊙	⊙	X	X	⊙	⊙	⊙
			60	X	⊙	⊙	X	X	⊙	⊙	⊙
			80	X	X	⊙	X	X	⊙	X	⊙

Chemicals	Material		P C	P P	P V	S T	S S	F M	E M	P D	T F						
	Temperature (°C)	Concentration (%)										V	d	3	3	P	P
Organic Chemicals																	
C ₅ H ₁₂ OH Amyl Alcohol	40	80	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
C ₆ H ₄ (C ₆ H ₄)OH o-Cresol	20	40	△	X	⊙	X	X	⊙	X	⊙	⊙						
	40	60	△	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
m-C ₆ H ₄ (C ₆ H ₄)OH m-Cresol	40	60	△	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
p-C ₆ H ₄ (C ₆ H ₄)OH p-Cresol	40	60	△	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
CH ₂ OHCH ₂ OH Ethylene Glycol	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	△	X	X	⊙	X	⊙	⊙						
N(CH ₂ CH ₂ OH) ₄ Triethanol Amine	40	60	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	X	X	X	⊙	X	⊙	⊙						
	80	80	X	⊙	X	X	X	⊙	X	⊙	⊙						
C ₃ H ₅ (OH) ₃ Glycerine	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
C ₆ H ₁₂ O ₇ Glucose	40	60	⊙	X	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
C ₆ H ₅ NH ₂ -HCl Aniline Hydrochloride	20	40	⊙	X	⊙	X	X	⊙	X	⊙	⊙						
	40	60	△	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Ca(ClO) ₂ .CaCl ₂ .H ₂ O Bleaching Powder	40	60	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Furfural	40	60	X	⊙	△	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
	80	80	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
C ₆ H ₆ OH Phenol	20	40	⊙	⊙	⊙	X	X	⊙	X	⊙	⊙						
	40	60	⊙	⊙	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	△	△	X	X	⊙	X	⊙	⊙						
	80	80	X	X	X	X	X	⊙	X	⊙	⊙						
HCHO Formalin	20	40	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	40	60	△	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
CH ₃ COCH ₃ Acetone	20	40	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
	40	60	X	X	X	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	X	X	X	⊙	⊙	⊙	⊙						
CCl ₄ Carbon Tetrachloride	40	60	X	X	⊙	⊙	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	⊙	X	⊙	X	⊙	⊙						
Cl ₂ =C=Cl ₂ Perchlor Ethylene	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
C ₆ H ₄ (OH) ₂ Hydroquinone	40	60	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
C ₆ H ₅ NO ₂ Nitro benzene	20	40	X	⊙	△	X	X	⊙	⊙	⊙	⊙						
	40	60	X	⊙	X	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
C ₆ H ₅ NH ₂ Aniline	40	60	X	⊙	X	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
C ₆ H ₆ Benzene	20	40	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
	40	60	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	△	X	X	⊙	X	⊙	⊙						
CHCl ₃ Chloroform	20	40	X	△	⊙	X	X	⊙	X	⊙	⊙						
	40	60	X	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	X	X	X	⊙	X	⊙	⊙						
	80	80	X	X	X	X	X	⊙	X	⊙	⊙						
C ₆ H ₅ CH ₃ Toluene	20	40	X	X	⊙	X	X	⊙	X	⊙	⊙						
	40	60	X	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	△	X	X	⊙	X	⊙	⊙						
	80	80	X	X	X	X	X	⊙	X	⊙	⊙						

Chemicals	Material		P C	P P	P V	S T	S S	F M	E M	P D	T F						
	Temperature (°C)	Concentration (%)										V	d	3	3	P	P
Others																	
H ₂ O Water	40	60	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	⊙	⊙	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	⊙	⊙	⊙	⊙	⊙	⊙						
I Iodine	20	40	△	⊙	⊙	X	X	⊙	X	⊙	⊙						
	40	60	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
Pickel Liquor for Tinplating (Ferrostan method)	20	40	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Pickle Liquor for Chromeplating	40	60	⊙	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
PEG#400 HOCH ₂ (CH ₂ OCH ₂) _n CH ₂ OH Polyethylene Glycol	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Sumition(Extremator)	40	60	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Vinegar	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Olive Oil	40	60	⊙	⊙	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Castor Oil	40	60	⊙	⊙	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Coconut Oil	40	60	X	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Cottonseed Oil	40	60	X	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Casein	40	60	X	X	⊙	X	X	⊙	X	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Gelatine	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	X	⊙	⊙						
Soap	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
Milk	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
Asphalt	40	60	⊙	⊙	⊙	X	X	⊙	⊙	⊙	⊙						
	60	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
	80	80	X	X	⊙	X	X	⊙	⊙	⊙	⊙						
Beer	40																



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