Electroplating & surface treatment

FLUX pump solutions for electroplating

From cleaning, pre-treatment and electrolytic solutions to post-treatment, passivation and wastewater treatment – reliable pumping for any application.

- Acid or alkaline wastewater
- Anodising baths
- Boric acid
- Caustic potash
- Caustic soda
- Chrome baths
- Chromic acid
- Copper baths
- Degreasing baths
- Defoamer
- Demineralised water
- Flocculant (e.g. polymers)
- Hydrochloric acid
- Hydrofluoric acid
- Lime milk
- Nickel baths
- Nitric acid
- Passivation solutions
- Phosphoric acid
- Pickling baths
- Precipitant (e.g. iron (III) chloride)
- Sealing coats and protective lacquer
- Sulphuric acid
- Surfactant
- Wastewater containing sludge
- Zinc baths

FLUX solutions for electroplating

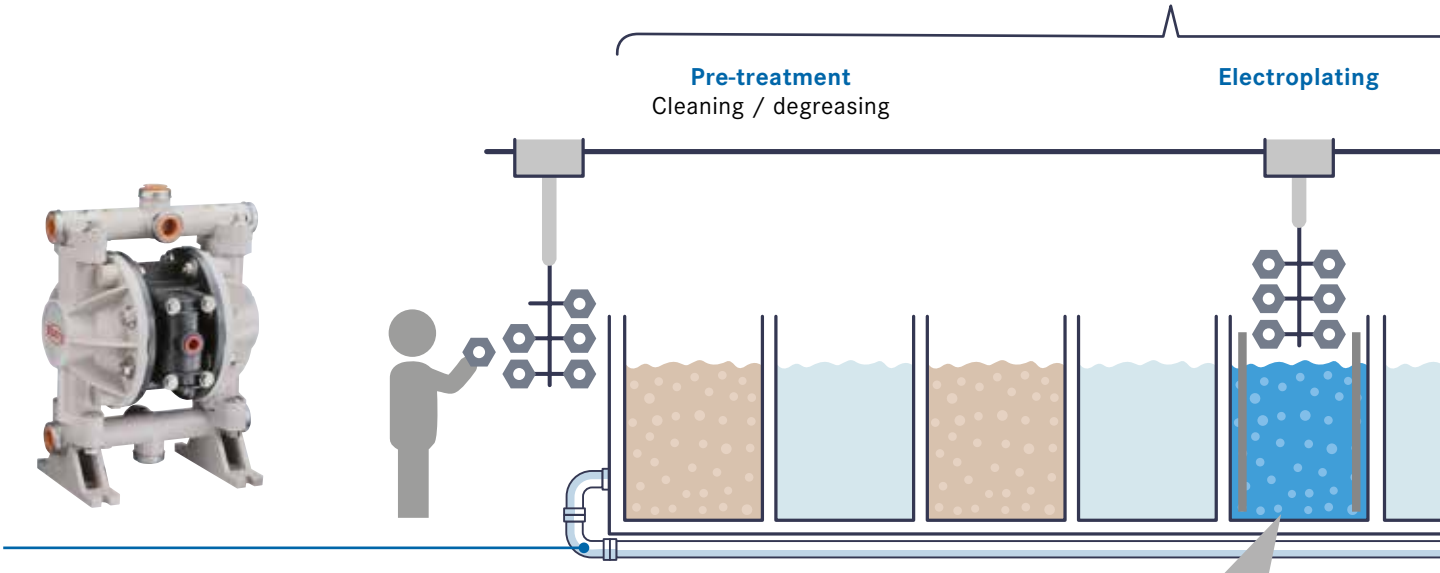
- Maximum occupational safety
- Also available as a mobile option on a trolley

- **Mobile pumps**
  - E.g. **COMBIFLUX** (p. 5) made from PP with battery-powered motor for 45 % caustic soda
  - Or **F 430** (p. 4) e.g. made from PVDF and F 458-1 motor with protection class IP 55 for highly concentrated media, such as 60 % nitric acid

- **SAFETEC pump set** (p. 8)
  with **MAGSON MAS magnetic centrifugal pump** (p. 7)
  e.g. made from ETFE to meter 96 % highly aggressive sulphuric acid

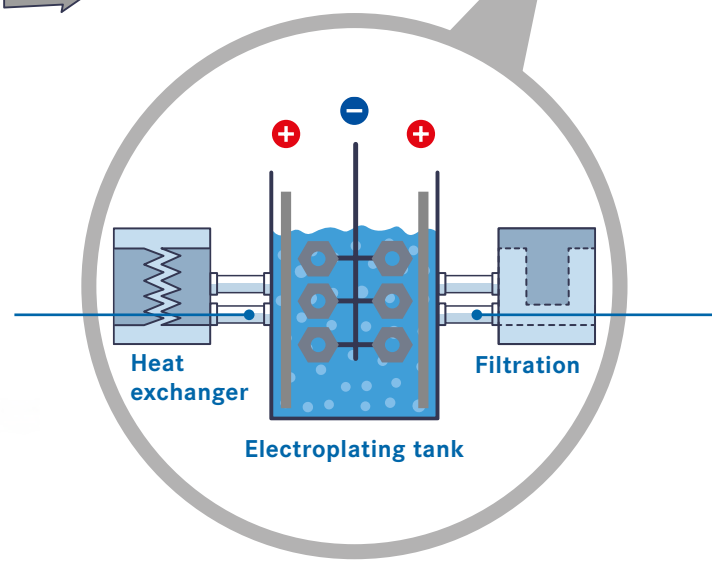
Solutions for
- topping up baths
- pumping these chemicals in batching tanks or smaller containers

Addition of chemicals



- **FDM compressed air diaphragm pump** (p. 12)
  e.g. made from PP for completely emptying a pickling tank with a hydrofluoric acid and phosphoric acid component as well as residual sludge

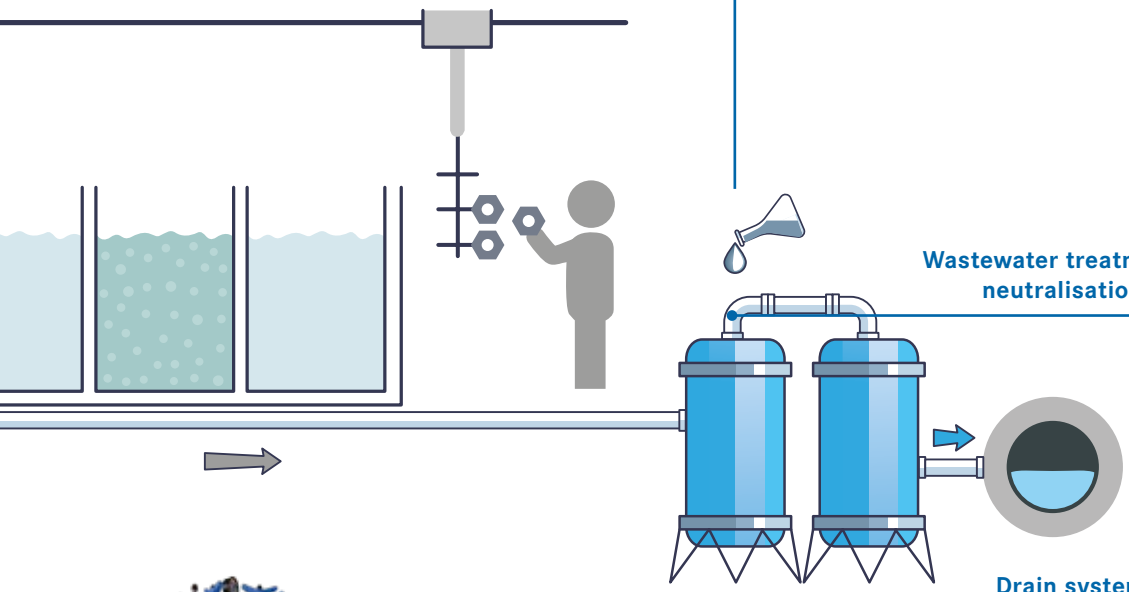
- **MAGSON magnetic centrifugal pump** (p. 7)
  e.g. made from PP for circulating a nickel bath, as option via a heat exchanger to retain temperature



▸ **IBC mixer** (p. 12)
for suspending e.g.
lime milk before metering

▸ **PERIPOWER peristaltic pump** (p. 13)
e.g. FHP 15 for low-maintenance pumping
of abrasive lime milk with solid particles
to neutralise acid wastewater

Post-treatment



▸ **SONCO filter system** (p. 10)
e.g. as cartridge filter and with hermetically
sealed MAGSON magnetic centrifugal pump
made from PP for filtering a zinc bath

▸ **Centrifugal immersion pump** (p. 11)
e.g. **F 640** for efficiently pumping acid
wastewater between collection tanks or
also from the pump sump / wastewater
lifting facility

Drum pumps of the F 400 series

For mobile pumping and emptying

FLUX drum and container pumps are suited to pumping various low-viscosity fluids, including those which are particularly aggressive and highly combustible. Constructed on the basis of a modular design, various pumps can be operated with the same motor. Their light weight means that the pumps can be simply carried from container to container. The motor and pump are easy to operate, ensuring short changeover times. Operators can choose from various pumps with and without a mechanical seal as well as versions for larger delivery heads and mixing pumps. A version with explosion protection is also available. Depending on medium, the materials for the pump tube, seals, hoses, pump nozzles and appropriate drive motor are selected specifically to ensure optimum chemical resistance, temperature and pump capacity. More powerful motors are available for media of a higher density, such as sulphuric acid.

F 430 / FP 430

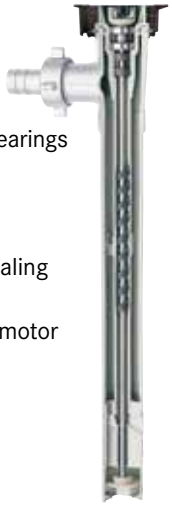
With mechanical seal

Advantages/features:

- Medium is not dispersed - one pump can be used for different media
- Easy to dismantle for rapid cleaning
- Immersion lengths of up to 3000 mm are possible
- Stainless steel and Hastelloy C versions can be used in areas subject to explosion hazards
- Available as a variant for dry well installation
- **Exclusively from FLUX:** Steel core in the inner tube (with PP and PVDF versions) ensures maximum stability and prevents changes in length at high and low temperatures
- E.g. in PP with powerful F 458-1 motor (protection class IP 55) for 50 % caustic soda

F 424 / FP 424

No seals near the media



Advantages/features:

- Low maintenance – no wear to the seals or bearings
- Long-lasting
- Good durability
- Unaffected by running dry
- Cannot be contaminated by lubricants or sealing compounds wearing
- E.g. in PVDF with titanium shaft with F 458 motor for chromic acid

Technical data

	400 series
Container sizes	Canisters, ~200 l drums, IBCs, tanks > 1000 l
Flow rate max.	240 l/min*
Delivery head max.	30 MWC*
Viscosity max.	1200 mPas*
Motor drive	Electric/pneumatic

F 430 being used to pump out of an IBC.

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)

Drum pumps of the F 300 series

For filling smaller quantities

The compact JUNIORFLUX and COMBIFLUX drum pumps were developed especially for filling smaller quantities of liquid from canisters, 200-litre drums or 1000-litre IBCs. Thanks to their small outer tube diameter, they are also ideal for use in containers with narrow necks.

The JUNIORFLUX series has a permanently mounted commutator motor and is available in variants with and without a mechanical seal. The COMBIFLUX models permit flexible use with a removable commutator motor (FEM 3070) or battery-powered motor (FBM-B 3100), making wireless operation with long runtimes and rapid battery charging possible. Both series of pumps have a low weight, are easy to use and offer flexible fields of application. They are also impressively resistant to various media.

JUNIORFLUX F 310 / 314 with F 310 motor

FEM 3070 motor

FBM 3100 motor

COMBIFLUX FP 314 pump

Advantages/features:

- Low total weight - minimal effort required when changing drums
- Can pump out of containers with narrow necks

JUNIORFLUX

- With permanently mounted motor
- Available as options with a mechanical seal and sealless

COMBIFLUX

- Motor can be taken off with ease, connected by means of quick coupler
- Can be operated with a wired commutator motor or using the brushless, flexible FBM-B 3100 battery-powered motor – ideal for electroplating
- Pump has no seals in the liquid area

Technical data

	JUNIORFLUX	COMBIFLUX
Container sizes	Canisters, ~200 l drums	Canisters, ~200 l drums, IBCs
Flow rate max.	57 l/min*	60 l/min*
Delivery head max.	8.5 MWC*	8.5 MWC*
Viscosity max.	250 mPas*	250 mPas*
Material of pump outer tube	PP, PVDF, stainless steel	
Motor drive	Electric	

FBM-B 3100 battery-powered motor – the perfect solution for users who don't want to have to lay cables or for cases where this would be problematic.

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)

Flow meters & accessories

Flow meters

FLUX flow meters, constructed on the basis of the nutating disc principle (FMC), oval gear principle (FMO) or rotor turbine principle (FMT), provide the right solution for any application. Depending on model and size, they can be used on say FLUX drum pumps or for stationary applications, e.g. in pipework systems. In combination with FLUXTRONIC® evaluation electronics for FMC and FMO, filling and metering processes for virtually all fluids can be performed with maximum precision and the greatest possible safety. In automatic mode, signals can also be issued for control purposes. A whole host of processes can therefore be managed. In electroplating, FLUX flow meters allow the flow rates of e.g. 98 % sulphuric acid to be captured when topping up baths. They are available in stainless steel as well as chemical-resistant versions in PP or PVDF.

Technical data

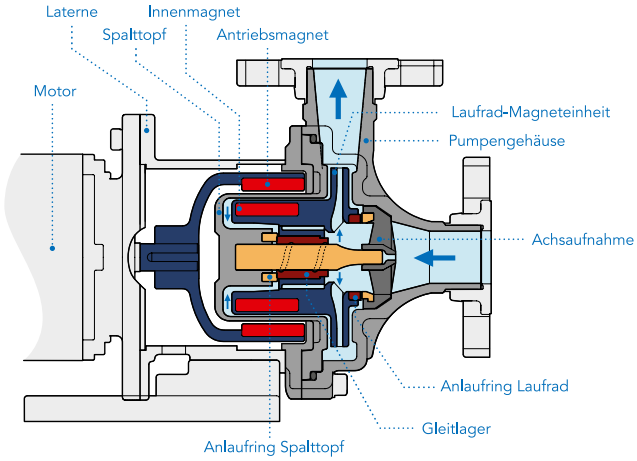
	FMC/FMO/FMT
Flow rate max.	380 l/min*
Viscosity max.	500000 mPas*
Operating pressure max.	200 bar*
Use	Stationary or mobile with drum or progressive cavity pumps

FLUXTRONIC® evaluation electronics can be mounted e.g. on flow meters or directly on pump nozzles.

Accessories

To supplement the huge range of pumps, FLUX also supplies an extensive range of accessories. No matter whether intended for mobile or stationary use – FLUX accessories turn a FLUX pump into a tailored delivery system for any area of application and purpose. This ensures smooth and safe operation as well as simplifying the task in hand. Foot strainers prevent solids from penetrating the pump tube and thereby help to extend the pump's life. By using storage fixtures, pumps can also be stored in a manner that doesn't take up too much space. Accessories, such as the right hose, are also available for every application – of the length required, pre-assembled and integrated.

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)



MAGSON magnetic centrifugal pump

No matter whether you are working with acids or alkalis – MAGSON magnetically coupled pumps will pump highly-aggressive media, such as caustic soda or sulphuric acid. Safely operating standard centrifugal pumps with shaft seals, which are prone to wear, requires a lot of technical work and high financial outlays, especially if working with media which are highly aggressive or prone to crystallisation. System availability is also reduced by the fact that maintenance work has to be carried out regularly. The benefit of sealless, magnetically-coupled centrifugal pumps, which can also be self-priming on request: hermetically sealed and require no maintenance. The externally rotating drive magnet transfers the motor force to the inner solenoid and therefore the impeller without making any contact. There is therefore no need for a continuous shaft and, as a consequence, no wearing shaft seal to the motor. The pump chamber and drive are hermetically separated from one another by a rear casing. There is therefore no scope for leaks and the pumps require no maintenance.

The MAGSON **MA** series impresses customers with its hermetically sealed design, maintenance-free operation and high efficiency – ideal for low operating costs.

On top of these benefits, the MAGSON **MAS** series also features a self-priming function and draws in media from a depth of up to 5 m in less than two minutes.

Technical data

	MA	MAS
Flow rate max.	950 l/min*	470 l/min*
Delivery head max.	42 MWC	27 MWC
Viscosity max.	150 mPas	
Operating pressure max.	6 bar	5.2 bar
Temperature max.	80 °C	70 °C
Suction capacity max.	–	5 MWC
pH value	0 – 14	
Main materials	PP / ETFE	

MAGSON BG 5 for circulating an electroplating bath with sulphuric acid via a heat exchanger to retain temperature.

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)

SAFETEC pump set

Very high levels of safety with aggressive media

Regulations relating to environmental protection, sustainability and the safe handling of dangerous chemicals are becoming more and more stringent. This explains why increasing numbers of chemicals are being sold in drums or IBCs, which are sealed and emptied by means of suction using a permanently installed immersion pipe.
Sealed containers cannot be emptied using traditional drum or container pumps because they no longer have openings to fit a drum pump. Instead, self-priming pumps with immersion pipes have to be used to empty the containers by means of suction. We developed the SAFETEC pump set for this very purpose. Available with integrated quantity measurement and for metering as an option.
At the heart of the SAFETEC pump set lies the MAGSON MAS self-priming magnetic centrifugal pump.

Advantages/features:

- Sensor for detecting an empty container and pump shutdown
- Quantity measurement for filling containers or for batch metering*
- Convenient to operate via touch panel*
- Maximum safety thanks to hermetically encapsulated magnetic centrifugal pump and leak sump

*Options depending on model

In particular when working with highly aggressive media, such as sulphuric acid or caustic soda, **SAFETEC** improves occupational safety while also protecting the environment because no medium can escape between the container and pump and there is no scope for contact with the medium.

All SAFETEC components are combined in a compact console. This is available with a wall bracket or on a mobile trolley.

Mobile version of the SAFETEC Komfort D e.g. for topping up baths with highly aggressive sulphuric acid.

The user interface of the SAFETEC panel can be adapted individually to your specific requirements.

Versions:

- BASIC: with main switch with integrated motor overload trip
- STANDARD: control section on pump set with main switch, ON/OFF button and safe to run dry
- KOMFORT D: control section with touch panel, including metering. Operating statuses and faults are displayed as text, in automatic mode various filling quantities can be stored and selected. Once filling has started, the pump starts and stops automatically as soon as the desired fill quantity is reached.

Technical data

SAFETEC pump set	PP	ETFE
Material of pump	PP	ETFE
Material of piping	PVC	PVDF
Seals	EPDM	FKM
Temperature max.	60 °C	
Pump capacity max.	40 l/min*	
Delivery head max.	13 MWC	

The plug-and-play dry coupling ensures safe and drip-free handling as it prevents media and vapours from escaping.

* With a 2 m suction hose DN 19 and CDS coupling as well as a 3 m pressure hose DN 19 with pump nozzle.

SONCO filters and filter devices

SONCO – clean and safe

The new generation of filter chambers, devices and systems in a solid plastic design made from PP or PVDF

FLUX applies the principle of always thinking one step ahead. And that's why we haven't just developed a new filter, but we've examined in detail and analysed every single part to establish how they can all be improved to the benefit of customers.
The result is the SONCO filter. SONCO filters are the perfect solution for anyone needing absolute seal integrity and reliability when filtering highly aggressive acids and alkalis, degreasing baths, chemicals and highly corrosive fluids. Outstanding product quality and the innovative design guarantee maximum efficiency and flexibility in the process. Combining this with the comprehensive FLUX service ensures that you can reliably run your systems on a continuous basis.

Advantages/features of SAFETEC

- Very high levels of resistance thanks to metal-free solid plastic design
- Maximum safety thanks to complete spray protection, even at the cover screws
- Convenient to use: fold-up cover with non-slip knobs – no lifting required
- Efficient filtration with optimised flow for even filter loading and minimal loss of pressure
- Practical extras: pressure gauge and drain valve fitted as standard in sizes 3 and higher

SONCO filter, e.g. as a cartridge filter, for filtering a nickel electrolyte bath

Technical data

	SONCO filter
Filter capacity max.	45,000 l/h
Viscosity max.	150 mPas
Operating pressure max.	4 bar
Temperature max.	80 °C / 95 °C
pH value	0 – 14
Main materials	PP / PVDF

Versions:

- SONCO filters can be configured with all standard filter methods, including:
  - cartridge filter
  - plate filter
  - oil absorber
  - bag filter
  - active carbon
- Custom solutions for filter systems are also available – including planning and simulation

Centrifugal immersion pumps
for pumping and circulating large quantities

FLUX centrifugal immersion pumps are used in cases requiring large delivery quantities, continuous running or special immersion lengths. They are particularly well suited to pumping and circulating aggressive and abrasive media from small containers to tank heights of up to 4.1 m. Customers can choose from various materials in line with their chemical and temperature requirements. Sealless and horizontal versions are also available. FLUX centrifugal immersion pumps are individually configured and manufactured to satisfy the applicable technical requirements. Typical applications include pumping electroplating wastewaters (F 640) and continually circulating baths with e.g. copper sulphate, chrome or zinc electrolyte (F 728).

Technical data

	600 series	700 series
Flow rate max.	42 m³/h*	45 m³/h*
Delivery head max.	32 MWC*	35 MWC*
Viscosity max.	2500 mPas*	150 mPas*
Material of pump outer tube	PP, PVDF, stainless steel	PP, PVDF
Nominal size (standard)	600 – 4100 mm	300 – 1800 mm

Advantages/features:

600 series, e.g. F 640:
- For immersion lengths of up to 4100 mm
- Also pumps fluids containing solids
- Can be used for mobile and stationary applications
- Pump is hermetically sealed

700 series, e.g. VERTIFLOW F 728:
- Suited to continuous use and safe to run dry (up to immersion depth of 600 mm)
- Requires no maintenance thanks to sealless design in fluid area
- Good durability and maximum stability thanks to steel core, length does not change with fluctuations in temperature (F 716)

F 640 – pumping thinned hydrochloric acid out of a pickling tank.

F 716 – circulating chemicals in a pickling tank.

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)

Compressed air diaphragm pumps and mixers

FLUX FDM & RFM compressed air diaphragm pumps

FLUX compressed air diaphragm pumps are self-priming and safe in dry operation. They are characterised by their versatility and can be used for virtually all kinds of media. They are available in a solid design (RFM) or injection moulded version (FDM) for a huge range of different applications. They are designed for high pumping pressure levels of up to 8 bar and impress users with their ease of handling and other plus points.
The 100 % start-up safety in all shutdown positions guarantees reliability and safe operation. The flow rate can be controlled continuously by means of the amount of air used. The delivery quantity is also easy to calculate. The integrated silencer makes the compressed diaphragm pumps very quiet. What's more, the pumps require little maintenance, especially when working with pure media.

Technical data

Flow rate max.	1040 l/min*
Delivery head max.	200 MWC*
Operating pressure max.	8.6 bar
Suction lift	When filled with product max. 9.5 m* When dry max. 4.5 m*
Viscosity max.	15,000 mPas
Size of solids max.	9.5 mm
Material of housing	PP, acetal conductive, PVDF, PTFE, aluminium, stainless steel, cast iron
Material of diaphragm	EPDM, FKM, NBR, PTFE, Santoprene

FDM: pumping nickel chemicals to prepare an electroplating tank.

FLUX mixers

Anyone wanting to efficiently disperse, emulsify, homogenise, cool, dissolve, mix, neutralise, stir and heat exchange media, faces a challenging task – from a technical standpoint. The flows resulting from the effect of mixing depend on the container shape, medium and mixer type. The flexible FLUX modular system provides numerous options for ideally designing the motor, shaft and mixing blade. In similar electroplating mixing processes, mixers are used e.g. to suspend lime milk or for similar mixing processes.

Technical data

Container sizes	IBCs, tanks up to approx. 4000 l
Circulating capacity max.	650 m^3/h
Speeds	750 – 1500 rpm
Viscosity max.	12,000 mPas
Long mixer shaft	max. 1800 mm
Material of mixer shaft	Stainless steel (1.4435), optional surround: PVDF/PE

PERIPOWER peristaltic pump
The ideal solution for abrasive media

The PERIPOWER peristaltic pump is a powerful self-priming positive displacement pump, which impresses customers with its extreme robustness and ease of maintenance. Its mode of operation permits gentle pumping of abrasive media and is ideally designed to efficiently pump media with a viscosity of up to 20,000 mPas, 25 % dry matter content as well as particles with a size of up to 40 % of the hose diameter.

Given its design, the PERIPOWER is safe to run dry and saves large amounts of energy thanks to its efficient roller principle.

You can rely on our pumps to deliver first-class performance in a wide range of applications, such as pumping solids and wastewater containing sludge or metering abrasive lime milk for neutralisation.

FHP 15: pumping 45 %, abrasive lime milk from a 1000 l IBC into a wastewater facility's receiver tank.

pumping wastewater containing solids: the PERIPOWER achieves displacement volumes of up to 300 m³ 3/h.

Technical data

	FHP peristaltic pump
Nominal volumetric flow	max. 300 m³/h
Operating pressure max.	max. 10 bar (FHP 100 and higher)
Inner hose diameter	max. 200 mm
Hose material	NRH, EPDM, NBR
Material of housing	Polyurethane / stainless steel / steel (powder coated or galvanised)
Connection material	Stainless steel/ PP

When compared with rotary piston pumps or progressive cavity pumps, the **PERIPOWER peristaltic pump** incurs less wear and is easier, faster and cheaper to maintain since its hoses can be replaced.
Its user-friendly design allows the hose to be easily replaced in a matter of minutes without you requiring special tools or specialist staff, keeping your systems ready for use at all times.

FLUX solutions for electroplating & surface treatment

	Mobile pumps	Mobile pumps	Mobile pumps	
Series of FLUX pumps	**Drum pumps, 300 series JUNIORFLUX/COMBIFLUX**	**Drum and container pumps, 400 series**	**MAGSON magnetic centrifugal pumps**	
				
Typical areas of application	Mobile filling of liquid media in smaller quantities	Mobile filling of liquid media (predefined quantities too) and/or mixing	Solid plastic process pumps for the chemical industry, electroplating and the suchlike to pump aggressive media	
Container/use	Canisters ~ 200-l drums ~ 1000-l IBCs	~ 200-l drums ~ 1000-l IBCs Tanks > 1000 l	as process pump	
Flow rate max.*	60 l/min	240 l/min	44 MWC	
Delivery head max.*	8.5 MWC	30 MWC	80 MWC	
Viscosity max.*	250 mPas	1200 mPas	250 mPas	
Special features	▸ Brushless battery-powered motor	▸ Mixing pump ▸ 99.98 % drum emptying ▸ Pump which is easy to dismantle ▸ Also as pump sets for particular applications	▸ Modular system ▸ Sturdy housing ▸ Different types of connection ▸ Magnetic coupling, therefore hermetically sealed ▸ Process pumps	
Drive	Electric, either mains-operated or battery-operated	Electric or pneumatic	Electric	

* The maximum flow rate is a test bench value, measured with water at 20°C at the pressure connector of the pump, without attachments (hose, pump nozzle, flow meter)

	Process pumps	Process pumps	Process pumps
	Centrifugal immersion pumps of the 600 and 700 series	**Compressed air diaphragm pumps, FDM and RFM series**	**PERIPOWER peristaltic pumps**
			
	Process pumps can be used in stationary and mobile applications to fill and circulate liquid media in large quantities	Process pumps for liquid (including abrasive) to high-viscosity media – for small to large delivery quantities and high levels of pressure buildup	Process pumps for low-pulsation and low-maintenance pumping of viscous, abrasives media and those containing solids
	~ 1000-l IBCs Tanks > 1000 l as process pump	~ 1000-l IBCs Tanks > 1000 l as process pump	~200-l drums 1000-l IBCs Tanks > 1000 l
	74 m^3/h	1000 l/min	300 m^3/h (or 5000 l/min)
	35 MWC	200 MWC	100 MWC
	2500 mPas	15,000 mPas	approx. 20,000 mPas
	▸ e.g. Can be used for AdBlue®** tank systems	▸ Stroke counter can be integrated ▸ Filter presses-high-pressure pump ▸ Cycle control can be integrated ▸ Version with flap valve for semi-solid substances up to max. 50 mm	▸ Abrasive media containing solids can be pumped ▸ Hose rupture sensor can be integrated ▸ The hose is the only wearing part in contact with the media ▸ Can be regulated using optional FC ▸ Self-priming ▸ Safe to run dry
	Electric	Pneumatic	Electric

** AdBlue® is a registered trademark of: Verband der Automobilindustrie e. V. (VDA)

The FLUX product portfolio

Drum and container pumps

Progressive cavity pumps

Peristaltic pumps

Centrifugal immersion pumps

Compressed air diaphragm pumps

Flow meters

Mixers

Magnetic centrifugal pumps & filters

Filling and dosing solutions

Find the right pump for your requirements quickly and easily.

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