

# Hygienic pumps - clean and safe in real life



topflo®



# topflo®

food & beverage industry



when it comes to being clean

# hygienic pumping

Whether you are handling food, beverages, cosmetics, pharmaceuticals or biotech products the fundamentals are very basic – the process equipment shall not contaminate the handled product and it shall be cleanable in desired way. So how will you be able to determine if your equipment such as pumps is safe and fulfills your requirements? A number of standards and directives for hygienic equipment are applicable. In this brochure you will learn more about them and how we have incorporated them in our hygienic product range.

The chart on the next pages gives you a brief introduction to applicable directives, norms and regulations and how they are incorporated in our pump range.

pharmaceutical &  
biotechnology industry



cosmetic industry



# Providing accurate pumps to fulfill your needs

✓ = standard      ✓ = option



## USP VI approved materials

U.S. Pharmacopeial Convention (USP) class I to VI defines how a plastic or rubber material may be exposed of human tissue. Class VI requires the most stringent testing and such materials may be used for example in implant devices.



## EHEDG certified products

The EHEDG (European Hygienic Engineering & Design Group) certificate proves that the design is according to the hygienic guidelines. Furthermore certified products are clean ability tested.



## FDA §21 CFR 177 materials

FDA (U.S. Food and Drug Administration) §21 CFR 177 lists polymers, e.g. rubber and plastic materials approved for equipment in contact with food products.

## EN 10204

### EN 10204 material traceability

The EN 10204 norm gives you a checklist and traceability of materials used in the equipment. 2.1 is a general statement of compliance with material specifications, while 3.1 provides specific track records all the way to the steel mill batch (normally only on metals in contact with the product).



## EC 1935/2004 regulation

This EU regulation applies to all food contact materials, e.g. metals, plastics and rubber materials. It requires that these materials are safe, are labeled with the glass-and-fork symbol, are traceable throughout the production chain (according to above EN 10204) and that they are produced according to good manufacturing practice (GMP).



## CE conformance

A product classified as machinery that carries the CE mark fulfill the essential health and safety requirements of the EC Machinery Directive 2006/42/EEC.



## ATEX Directive 94/9/EC

Equipment intended and approved for safe operation in potentially explosive atmospheres. The equipment is divided in main groups, categories, apparatus groups and temperature classes to define its suitability in the actual zone.

## AODD Diaphragm pumps



Pharmaceutical



EHEDG



Sanitary pumps



		Pulsation dampeners	Centrifugal pumps			Hose pumps		
								
Metal pumps	PE & PTFE pumps	Sanitary dampeners	CTH pumps	CTM pumps	CTS-H pumps	PT pumps	PTL pumps	
		✓	✓		✓			
		✓						
✓	✓	✓	✓		✓	✓	✓	
✓	✓	✓	✓		✓	✓	✓	
		✓	✓		✓	✓	✓	
✓	✓	✓	✓	✓	✓	✓	✓	
✓	✓	✓	✓		✓	✓		



# Integrated into your plant

## Clean water

Clean water or so called deionized water (clean water free from carbon molecules) is used widely in food and pharmaceutical processing plants.

Extremely important here is using 316L (low carbon) steel. Use of normal 316 will cause "picking" inside the pump when carbon molecules are "stolen back" by the deionized water. This will turn deionized water to normal water, the process will fail and also the pump will be destroyed. **The solution is using the Tapflo CTH centrifugal pump that always come with 316L wetted materials and optionally sintered (pure) silicon carbide seals.**



**CIP feeding pump**

## CIP cleaning

CIP cleaning (Clean In Place) is an automatic cleaning system where the pipe system with its pumps, valves and other equipment is flushed with a cleaning liquid, all while the system is assembled. To obtain sufficient cleanliness, the CIP flow speed in the system is minimum 1.5 to 2.0 m/s, relatively low back pressure up to 1 bar is required. **Tapflo CTH range is commonly used as CIP pump for pipe systems from 3/4" up to 4" (DN 15 up to DN 100).** For the concentrated cleaning chemicals, small sized 3/8" or 1/2" plastic diaphragm pumps are typically used.



**CIP preparation pump**



**CIP return pump**

**Process pump for handling hygienic liquids**



## SIP cleaning

SIP cleaning, Sterilize In Place is widely used in pharmaceutical industry, but becomes more and more popular also in food and beverage industries. Two methods are used for SIP, either the classic steam injection where basically no pumps are required, or liquid sterilization in closed pressurized (2 bar) system. This second method saves process equipment like pumps from dry running, saving costs and life of mechanical seals etc.



handling liquids in hygienic industries

# refining your process

In your production plant there are numerous of pump applications. Main focus is probably pumps for the ready products and clean water, however there are also just as much needs of pumps for ingredients, additives and auxiliary applications like detergents, chemicals and solvents.

**Whichever part of your process, we will provide the suitable pump solution.**

## **Moving the product**

The above mentioned applications are keystones in almost all food-beverage and pharmaceutical processes. However pumping the ready product is usually the greatest challenge. The first challenge is that the nature of the product might be demanding for process equipment like pumps; high viscosity, big solids or abrasive ingredients. The second challenge is that the product shall maintain its shape and nature after the process, without any destroying of solids, shearing or contamination. For these types of duties, a cleanable pump design, selection of materials and traceability are crucial. CTH centrifugal pumps, sanitary and EHEDG diaphragms pumps and PT/PTL hose pumps are used.

# Application examples

## food & beverage

World famous food & beverage producers as well as smaller local makers use Tapflo pumps in their processes. These two pages show a selection of them.

### Some of our customers:

- Kraft
- Nestle
- Coca Cola
- Carlsberg
- Unilever
- Danone



### Food Industry

- **Pumped media**  
Sugar and starch syrups – chocolate products
- **Pump**  
TJ125 STT sanitary pump with heating jacket
- **Application description**  
Transfer at ambient temperature



### Food Industry

- **Pumped media**  
Curd chesse - dairy products
- **Pump**  
T425 SWT sanitary diaphragm pump
- **Application description**  
Filling of packing machine, 9 mm grain contents, ambient temperature





## Food Industry

### ■ Pumped media

Vanilla custard - dairy products

### ■ Pump

T244 STT aseptic EHEDG diaphragm pump

### ■ Application description

Transfer to filling machine, ambient temperature



## Food Industry

### ■ Pumped media

Chocolate glaze for ice cream – dairy products

### ■ Pump

CTH BB hygienic centrifugal pump

### ■ Application description

Emptying of ice cream machine

# Application examples

## pharmaceutical, biotech & cosmetics

Some of the most exclusive Tapflo pumps are used in multinational pharma-, biotech- and cosmetic industries.

A handful of examples are shown on these pages.

### Some of our customers:

- Glaxo Smith Kline
- Astra Zeneca
- Pfizer
- Eli Lilly
- Novartis



### Pharmaceutical Industry

- **Pumped media**  
Oils and ethanol
- **Pump**  
T80 STT sanitary diaphragm pump
- **Application description**  
Pumping from tanks, transport and dosing



### Pharmaceutical Industry

- **Pumped media**  
Mushroom culture organic suspension
- **Pump**  
CTH CE hygienic centrifugal pump and TX30 STT sanitary diaphragm pump
- **Application description**  
Unloading from fermentation process reactor (CTH pump) and emptying of mushroom culture sediments (TX30 pump)



## Pharmaceutical Industry

- **Pumped media**  
Solvent pumping
- **Pump**  
TX120 STT industrial stainless steel diaphragm pump
- **Application description**  
Mobile nit for solvent pumping, with nitrogen pipe purge system



## Hygiene Products

- **Pumped media**  
Shampoos and liquid soaps
- **Pump**  
T125 STS sanitary diaphragm pump
- **Application description**  
Transfer of shampoos and liquid soaps directly to filling machines

# Product range

## Fast Facts:

- Capacity 0-820 l/min (216 US gpm)
- Pressure 0 – 8 bar (116 psi)
- Sizes Sanitary 1" up to 2 ½"  
EHEDG 1 ½" up to 2 ½"  
Plastic 1/8" up to 3"
- Materials PE, PTFE, and stainless steel AISI 316L (other material on request)

## Major Benefits:

- Very easy to control capacity and pressure by regulating air pressure and flow
- Self-priming and able to run dry without damage
- Hygienic smooth surface and long life diaphragms
- Pollution free and non-stalling air valve



EHEDG pumps



Sanitary pumps

### EHEDG aseptic diaphragm pumps

The EHEDG aseptic series AODD pumps are designed to pump food products, cosmetics or pharmaceuticals. This EHEDG (European Hygienic Engineering & Design Group) series is certified by the Danish Technological Institute and it guarantees that the design and selected materials are according to the guidelines. Apart from the design approval, the series has also been clean ability tested and approved.

The pumps are made from AISI 316L stainless steel with mirror polished surface finish Ra 0.8 (standard) or Ra 0.4 upon request. Plastics and rubbers are FDA approved and upon request USP VI approved. The pumps are designed for cleaning and sterilization in place (C.I.P. and S.I.P.).

Furthermore the manifold clamp connections and housing screws make it quick and easy to dismantle and manually clean the pumps internally. 3.1 trace ability documents will always follow when you receive your Tapflo EHEDG aseptic pump.

### Sanitary pumps diaphragm pumps

This pump series is sanitary designed with wetted metal parts in electro polished stainless steel AISI 316L, with possibility of extra fine surface finish Ra 0.8. Plastics and rubbers are FDA approved. The pumps are designed for cleaning and sterilization in place (C.I.P. and S.I.P.). Furthermore the manifold clamp connections and housing screws make it quick and easy to dismantle and manually clean the pumps internally.



meeting your needs with versatile

# air operated diaphragm pumps

Tapflo AODD range is extremely versatile, handling all sorts of liquid products: thin, thick, with solids, and sensitive.

## Plastic diaphragm pumps

Pumps made of polyethylene (PE HD) or virgin PTFE plastics handle all kind of chemicals, in food and beverage industries they are mainly used for pumping C.I.P. chemicals. In pharmaceutical industries they handle all types of raw chemicals. The pumps are available also in explosion proof ATEX-marked versions.



PE & PTFE pumps

## Metal diaphragm pumps

Molded industrial pumps in glass blast stainless steel AISI 316L, typically used for raw chemicals, solvents and waste applications. The pumps are available also in explosion proof ATEX-marked versions.

Available options:

- Heating jacket is available on the sanitary pumps, typically used in chocolate and glaze applications
- Flap valves is an option on sanitary pumps, the perfect solution for gentle pumping of big size solids up to 48 mm.
- Pneumatic systems are available for all our diaphragm pumps, adding increased safety by automatic control and monitoring:
  - Diaphragm rupture guardian system
  - Level control
  - Dead head and dry run guardian system
  - Start & start units
  - Batch control



Metal pumps

## Sanitary active pulsation dampeners:

The sanitary series of Tapflo dampeners has been designed in particular for food, beverage, pharmaceutical and cosmetic industries where cleanliness and sterile environment is necessary.

### Made to be clean

The dampener is designed and prepared for cleaning and sterilization in place – C.I.P. and S.I.P. These are automatic cleaning and disinfection procedures implemented in these industries so it is essential that our products are prepared to comply with these procedures.



# Product range

## Fast Facts Centrifugal Pumps:

- Capacity 0-60 m<sup>3</sup>/h (264 US gpm)
- Head 2 – 47 m (154 ft)
- Sizes ¾" up to 2 ½", 0.12– 11 kW
- Materials PP, PVDF and stainless steel  
AISI 316L

## Major Benefits Centrifugal Pumps:

- The centrifugal principle gives a very high capacity
- Pumps made from AISI 316L, ideal for any food contact applications
- Big choice of sealing face materials
- Many options available, see below

Our centrifugal pumps are very efficient, pumping low and medium viscous liquids with high capacity in relation to the size of the pumps. Mechanical sealed pumps in stainless steel, as well as seal less pumps in plastics PP and PVDF are available.



CTH pumps



CTM pumps



CTS-H pumps

### CTH centrifugal pumps

This hygienic single mechanical sealed pump series is supplied with electro polished Ra 0.8 pump casing and internals. This pump series is especially dedicated for hygienic duties in food and beverage industries. A wide range of sealing face materials are available – ceramic, graphite, SiC and with o-rings in FDA approved EPDM, FKM or FEP.

A number of special executions are available:

- Heating jacket – Great protection for the mechanical seal in applications with risk of solidification, example chocolate glaze, paraffin, starch, glucose syrup and margarine etc.
- Hygienic shroud – Easier to keep the pump externals clean, protects the motor from spraying water.
- Casing drainage – By positioning the outlet horizontal at the bottom, or by means of a drain connection the pump features a hygienic and automatic draining.
- Long coupled – The perfect solution for hot products like eatable oils

### CTM magnetic drive centrifugal pumps

These nonmetallic magnetic drive centrifugal pumps are ideal for low viscous chemicals. Made from either PP or PVDF, they safely handle concentrated C.I.P. chemicals.

### CTS-H self-priming centrifugal pumps

These open impeller self-priming centrifugal pumps, manufactured with excellent electro polished surfaces, FDA approved seals, high finish and mechanical strength, meet the demands from food and sanitary applications.

meeting your needs with versatile

# centrifugal and hose pumps

Our peristaltic pumps, PT & PTL, combine the best available materials with smart design solutions in order to maximize running time and minimize maintenance.

## PT and PTL peristaltic pumps - hose pumps

The high pressure PT series allows pressures up to 15 bar, while PTL is the low pressure series with max pressure 4 bar.



PT pumps



PTL pumps

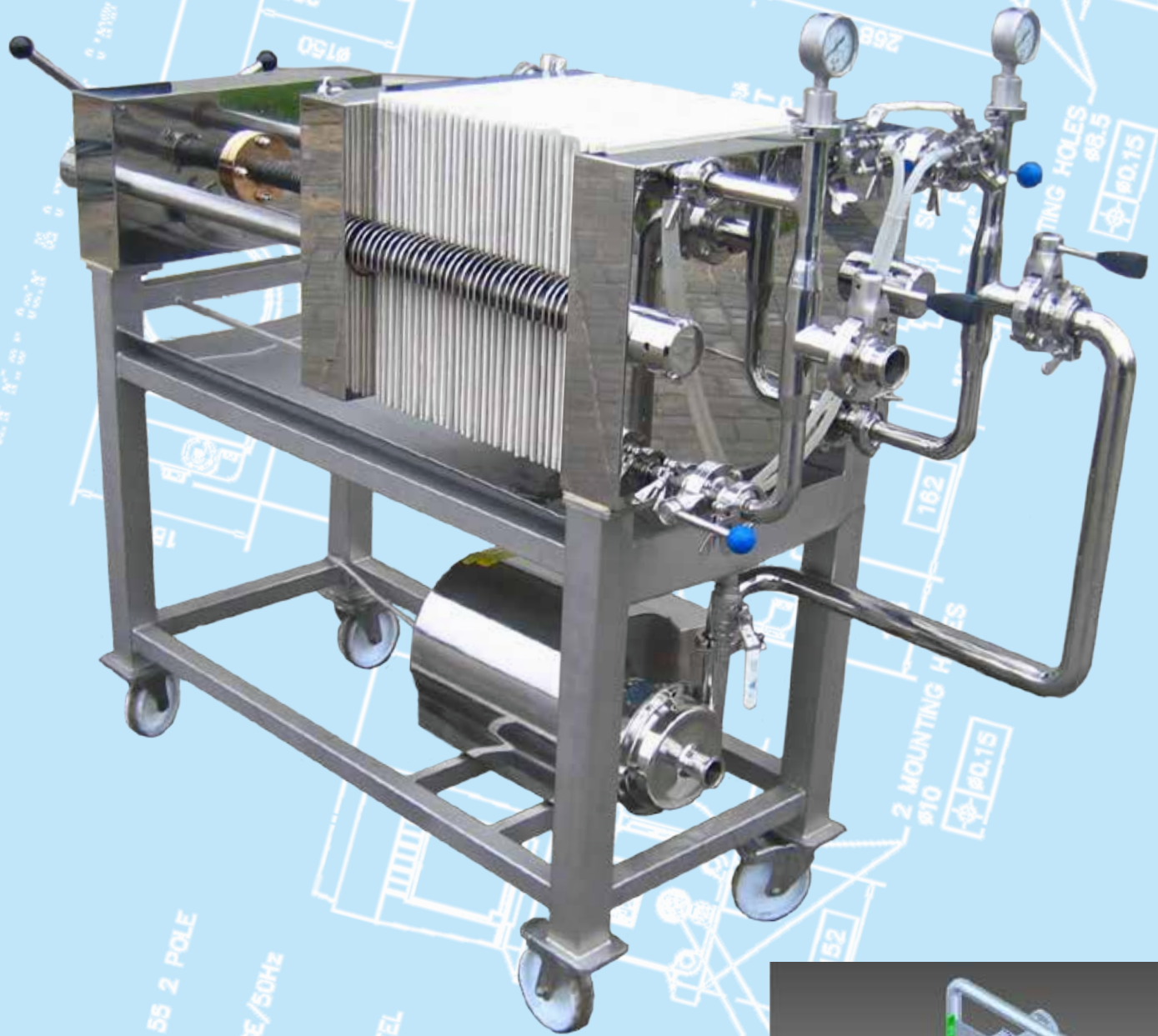
## Fast Facts Peristaltic Pumps:

- Capacity PT: up to 88 m<sup>3</sup>/h (387 US gpm)  
PTL: up to 10 m<sup>3</sup>/h (44 US gpm)
- Pressure PT: up to 15 bar (218 psi)  
PTL: up to 4 bar (58 psi)
- Sizes PT: 5 up to 125 mm hose  
PTL: 9 up to 45 mm hose
- Hose materials PT: NR, NR food (FDA), NBR, NBR food (FDA), EPDM, Hypalon, FKM  
PTL: Neoprene, Norprene, Silicone, Pharmed, Hypalon, EPDM, NR, NBR

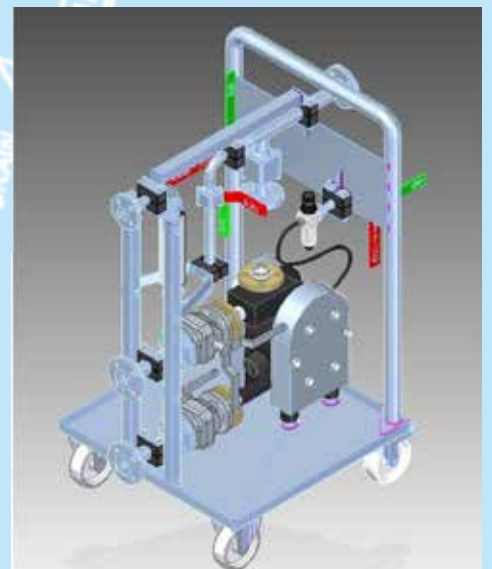
## Major Benefits Peristaltic Pumps:

- Easy maintenance, hose is only worn component
- Long hose life with unique hose composition
- Great choice of food approved hose materials
- Reversible flow
- Self-priming up to 9.8 m
- Able to pump high viscous products

# Tailor made pump systems



Mobile filter press unit  
for fruit squeezing, CTH  
pumps used for pumping  
fruit juice to storage tanks.





We build whatever you need through our

# engineering to order system

Engineering to Order is an engineering and manufacturing procedure which goal is to deliver specific solution desired by addressed process. In other words engineers are faced with special and most often unique problem and thereafter they try to provide adequate solution to solve or even improve proposed or existing process.

Engineering to Order is an answer to very many process optimization deliberations. Why is that? Even though we have so many products on the market there is still incomparable and unlimited number of situations where we just can't use them in the required manner. This is exactly the moment when Engineering to Order comes into play.

## **Where is a need people are thinking!**

It is most common to apply those kinds of machinery to production/close transport facilities. However there is quite a few other possible ways of Eng. to Order application. There have been cases where one specially provided solution became standard equipment and have a potential to come into series production.

Typically Engineering to Order projects are alive and still changing until delivery time or sometimes even after. This is because we are committed to provide customer with best care possible but also we want to learn how our solutions are performing and what else can we do to improve.



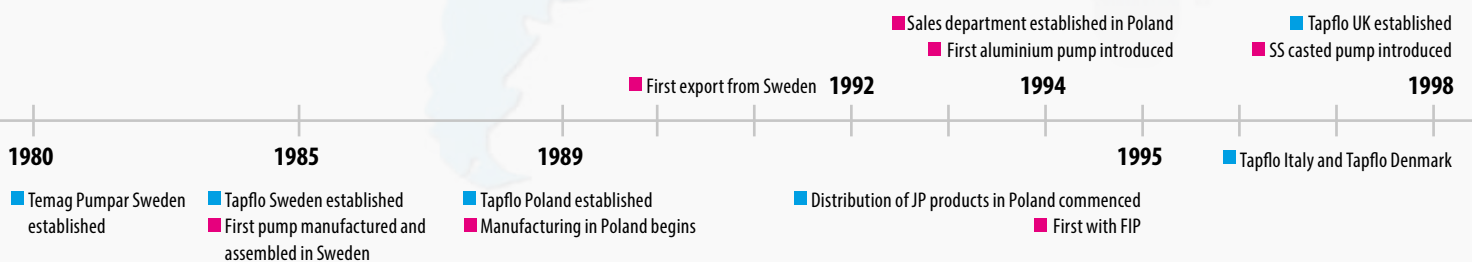
# topflo®

our ambition is to

# make



## Tapflo evolvement in the world



# pumping easy

what ever  
where ever  
when ever

Tapflo is a leading pump manufacturer with the ambition to provide a wide range of premium products for various industrial applications.

We are represented by Tapflo companies and distributors in more than 50 countries, with the main production located in Europe and Asia.

The headquarters is situated in Sweden.

## ■ Long term engagement is our core

Our aim - to continue to provide first rate products according to your needs and the latest technology is mutually beneficial. That is why we see each customer relationship as a long term commitment.

## ■ Local means on your terms

You can summarize Tapflo's marketing philosophy with the words: We think globally but act locally.

## ■ Flexibility - our idea of a good service

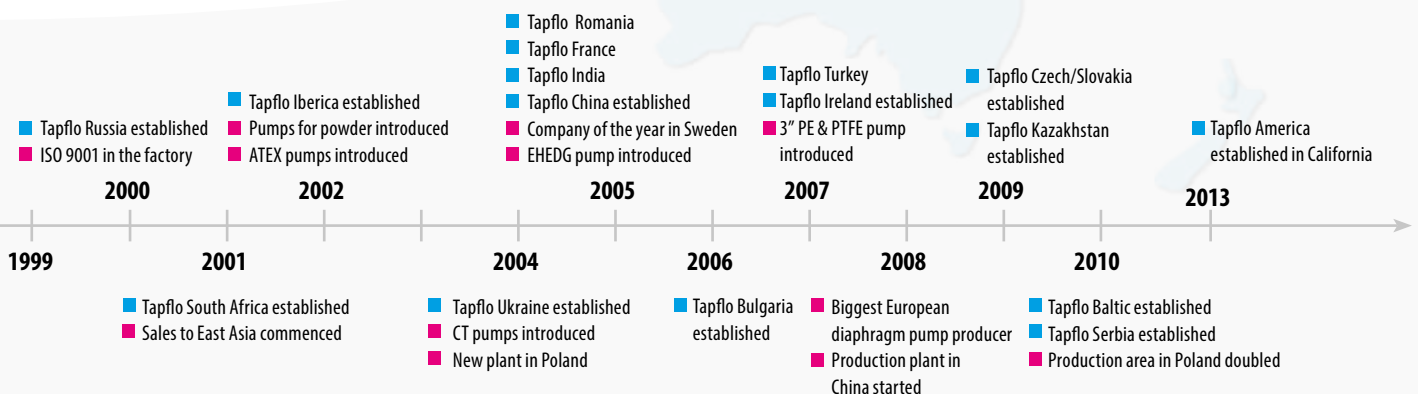
We are prepared to deal with reality, knowing that in practice this means answering questions, offering solutions and supplying spare parts with a minimal loss of time.

## ■ Customizing the product to the needs

Our intention is always to help our clients find the most cost effective solutions to increase their company's efficiency. If this means changing the design of the pump we see it as a challenge - not a problem.

## ■ To produce is to develop

When you are actively involved in the manufacture of a product, it is almost impossible not to discover ways to improve it. This allows us to frequently offer pumps that are even more sustainable and efficient.



# Please contact us at your nearest Tapflo office

Tapflo has over 60 sales offices spread over the world.

In most of the countries Tapflo is represented by own Tapflo Group Companies.

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