

 **Bornemann**

Tank Storage



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# Bornemann - Expertise in Tank Storage

Tank Farms and Terminals are usually located close to refineries or in hubs where marine tankers are discharging or loading their liquid cargo. Some depots are attached to pipelines from which they draw their supplies.

Bornemann Twin Screw Pumps have a wide field of application in Tank Farms and Terminals. They are used for loading and unloading of vessels, rail- and road tankers as well as for tank stripping, even at high viscosities, poor suction conditions and varying discharge pressures.

Bornemann Twin Screw Pumps are also the ideal solution for Tank Storage and Product Transfer in Refineries. Each process in Refineries is designed to maximize the value of the petroleum products produced. Separation, Conversion and Treatment are operative twenty-four hours a day.

Bornemann Twin Screw Pumps are belonging to the heart of those continuous processes, where both, low and high viscous products need to be transferred or metered. Typical products are e.g. mazut, bitumen, tar, heavy fuel oil as well as light products.



Onshore Terminal in Argentina

## User Advantages - Made by Bornemann

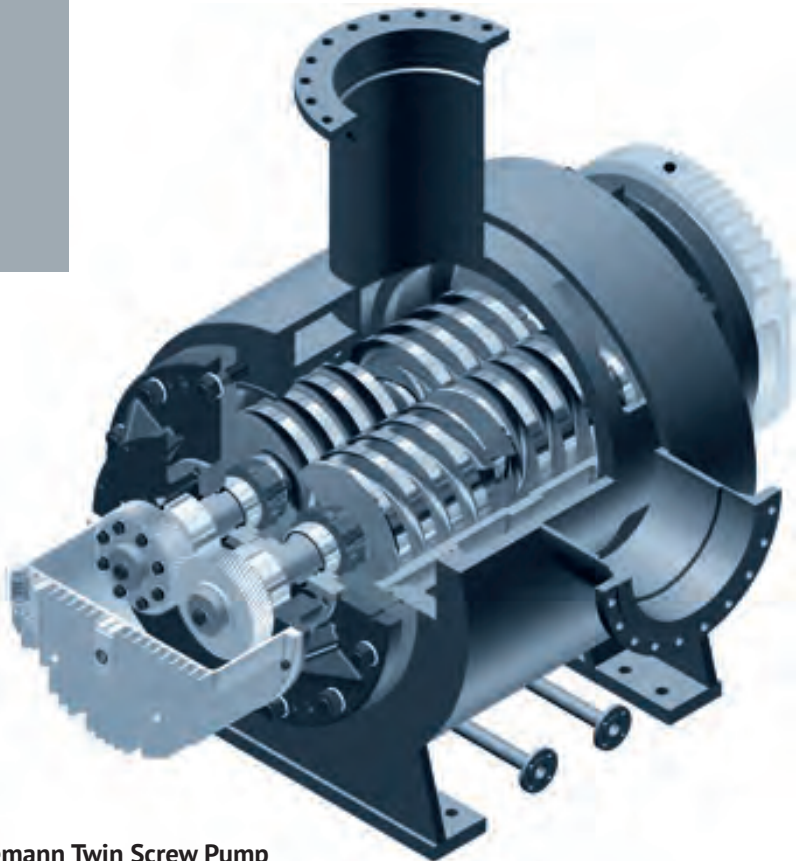
- Bornemann Twin Screw Pumps are self-priming up to 8,5 m (25 feet)
- Twin Screw Pumps are ideally suited for low and high viscous process liquids
- High total efficiency at different operating points
- Compact design ensures small footprint
- Functional principle ensures low-pulsation and low-noise operation
- Short-term dry run mode possible
- Constant flow at varying pressures and viscosities
- In conformity with ATEX 2014/34/EU, API 676 and the German TA Luft 2002

Bornemann Twin Screw Pumps are rotating positive displacement pumps; the gearwheels and roller bearings are located externally without contact to the process liquid. Their design characteristics include double volute flow, no metal contact of the pumping elements and the ability to self-prime.

Flow can be reversed simply by changing the direction of rotation.

Bornemann pumps are covering a wide range of performance in pressure, flow, temperature and viscosity of the conveyed products, i. e. low viscous liquids such as petrol, hydrocarbons, seawater and liquids with high viscosity such as bitumen, tar, glue, molasses, or aggressive media like acids and bases.

Bornemann's Twin Screw Pump portfolio covers more than 8 different models with various materials, sizes and designs for application-optimized solutions. Their advantages are operational safety, reliability and consistent performance, long life and low operating costs.



Bornemann Twin Screw Pump

# Bornemann Twin Screw Pump Series



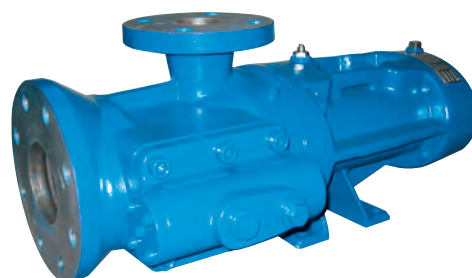
**W/V Universal Pump**  
8 sizes up to 2,800 m<sup>3</sup>/h



**HC/VHC High Capacity Pump**  
6 sizes up to 4,500 m<sup>3</sup>/h



**HP High Pressure Pump**  
4 sizes up to 800 m<sup>3</sup>/h



**SLI Compact Pump**  
3 sizes up to 180 m<sup>3</sup>/h

	Capacity		Differential Pressure		Viscosity		Max. Product Temperature	
	m <sup>3</sup> /h	gpm	bar	psi	mm <sup>2</sup> /s	cSt	°C	°F
<b>W/V Universal Pump</b>	10 - 2,800	50 - 12,300	up to 40/60	up to 600/900	0,5 - 200,000		up to 350	up to 660
<b>HC/VHC High Capacity Pump</b>	up to 4,500	up to 19,800	up to 16	up to 230	1 - 20,000		up to 120	up to 250
<b>HP High Pressure Pump</b>	20 - 1,500	100 - 6,600	up to 100	up to 1,500	1 - 10,000		up to 120	up to 250
<b>SLI Compact Pump</b>	up to 180	up to 790	up to 16	up to 230	up to 100,000		up to 120	up to 250

# Bornemann Twin Screw Pumps vs. Centrifugal Pumps

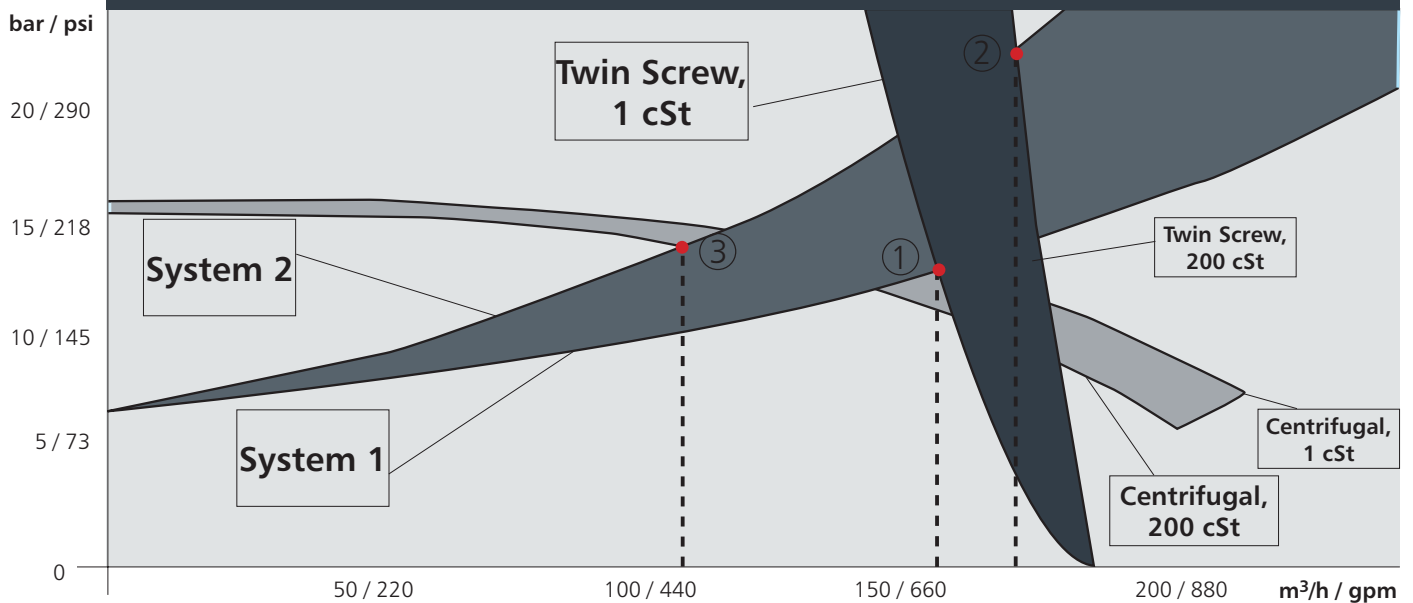
## Positive Displacement Pump

- Creates constant flow. Displaces volume from suction to discharge
- Without discharge pipe the liquid would exit at atmospheric pressure
- Suitable for applications where constant flow is required at variable system pressures
- Flow characteristic linear to pump speed, Speed/Capacity range 1:10
- Pump efficiency increases with higher viscosities, no density dependence

## Centrifugal Pump

- Transforms kinetic energy into pressure
- Without discharge pipe the liquid would exit at generated pressure
- Characteristic pump curve drops flow when pressure increases
- Fixed operating points
- Sensitive to product viscosity & density

## Performance Curve Twin Screw Pumps - Centrifugal Pumps by Change of Viscosity



1. Operating Point of Twin Screw and Centrifugal Pump at 1cSt
2. Operating Point of Twin Screw Pump at 200 cSt, flow increase
3. Operating Point of Centrifugal Pump at 200 cSt, significant flow drop

# Bornemann - Operating Flexibility



HC or W Series



i. e. 150 – 1,500m<sup>3</sup>/h  
@ 16bar, 150 cSt

VLCC



Barge

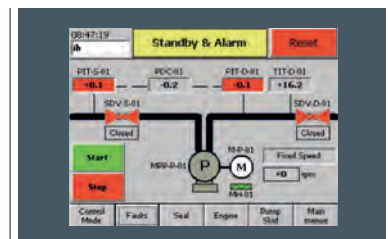


Rail  
Tanker



## Electrical Control System

- Tailor-made, engineered systems
- KIS-operation (Keep-It-Simple)
  - Human Machine Interface (HMI) in the control room
  - Local control panel on skid
  - HMI on the skid (if requested)
- All necessary pump protection procedures programmed
- Manual and automatic pump operation procedures
- Ready to communicate with a station control by Profibus, Modbus, Device-net or Ethernet
- Safe design for operator and environment
  - independently operating ESD system
  - pump protection system
  - pump control system
- Design in accordance to European or American Standards
- Ready for operation in hazardous area
- Standard components
- Systems pre-tested at Bornemann facilities
- ATEX Zone I



KIS Operation for Easy Control



On-Off Operation by Local Control Panel

# Selected Applications

## Argentina

Pump Type : HP 255  
Capacity: 248 m<sup>3</sup>/h (1100 gpm)  
Pressure: 39 bar (570 psi)  
Viscosity: 1 - 10 cSt  
Product: Crude Oil



## Singapore

Pump Type: W7.2z  
Capacity: 200 m<sup>3</sup>/h (880 gpm)  
Pressure: 8 bar (116 psi)  
Viscosity: 1 -380 cSt  
Product: Liquid Hydrocarbons



## The Netherlands

Pump Type: W9.6zk  
Capacity: 1500 m<sup>3</sup>/h (5300 gpm)  
Pressure: 10 bar (150 psi)  
Viscosity: 10 - 850 cSt  
Product: Fuel Oil & Gas Oil



## Russia

Pump Type: W8.5zk  
Heating Jackets  
Capacity: 1000 m<sup>3</sup>/h (4400 gpm)  
Pressure: 8 bar (116 psi)  
Product: Mazut



## China

Pump Type: HC 232  
Capacity: 200-600 m<sup>3</sup>/h  
(-2600gpm)  
Pressure: 8 bar (116 psi)  
Product: Crude Oil



## Middle East

Pump Type: W9.5zk  
Capacity: 1400 m<sup>3</sup>/h (6200 gpm)  
Pressure: 12 bar (175 psi)  
Product: Heavy Fuel Oil +  
Crude Oil



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