

CPX
***ISO Chemical
Process Pumps***

CPX
CPXS
CPXM
CPXP
CPXR
CPXV

Pump Supplier To The World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered and special purpose pumps and systems.

Pumping Solutions

Flowserve is providing pumping solutions which permit customers to continuously improve productivity, profitability and pumping system reliability.

Market Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the inquiry.



Dynamic Technologies

Flowserve is without peer in the development and application of pump technology, including:

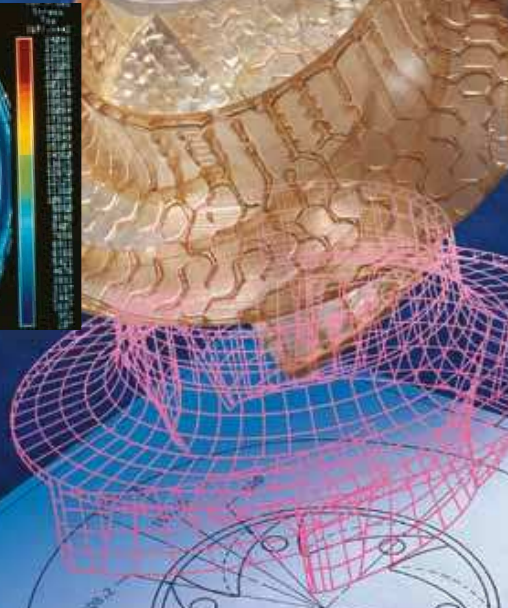
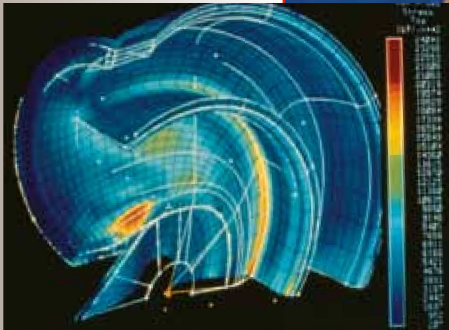
- Hydraulic engineering
- Mechanical design
- Materials science
- Intelligent pumping
- Manufacturing technology

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps, to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single stage process
- Between bearing single stage
- Between bearing multistage
- Vertical
- Submersible motor
- Positive displacement
- Nuclear
- Specialty



**CPX Family
of ISO Chemical
Process Pumps**

**Unmatched Versatility
and Flexibility**

The CPX family of ISO chemical process pumps offers a wide range of configurations including mechanically sealed, magnetically driven, self-priming, close coupled and vertical pumps. The CPX family, therefore, offers unmatched flexibility and breadth of pumping solutions in countless applications.

Spare Parts Interchangeability

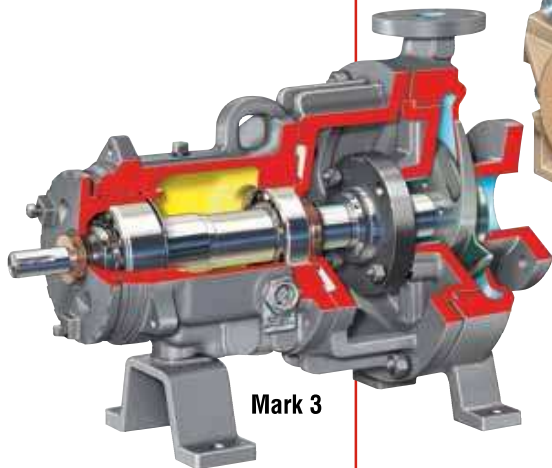
Commonality among the different pump configurations is a key benefit of the CPX family. All CPX pumps share the same state-of-the-art hydraulics, sealing options, and bearing frame options. This interchangeability translates into inventory and maintenance costs savings.

Industries

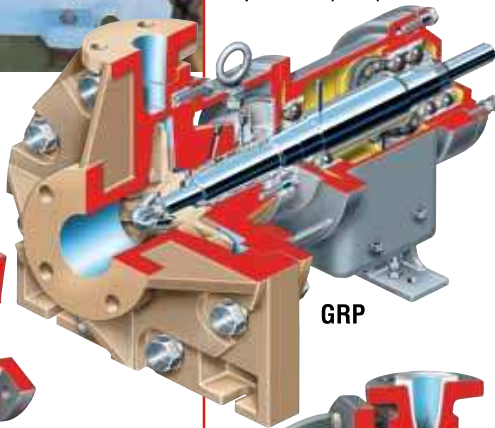
- Chemical
- Steel and primary metals
- Marine
- Wastewater treatment
- Aquariums
- Mining works
- Semiconductor manufacturing
- Pharmaceuticals
- Petrochemical

Complementary Pump Designs

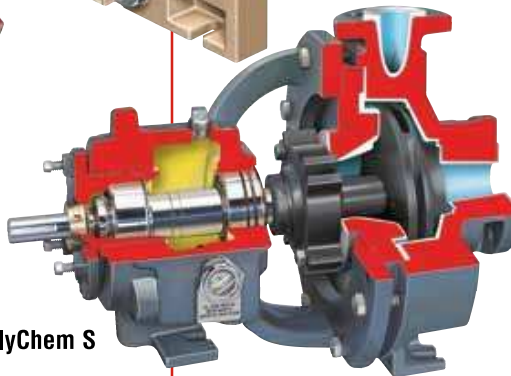
- Mark 3™ ASME (ANSI) chemical process pump
- PolyChem PFA lined series of sealed or sealless ISO, ASME (ANSI) or JIS pumps
- PolyChem GRP ASME (ANSI) non-metallic chemical process pump



Mark 3



GRP



PolyChem S

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Pump**

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**CPX
ISO Standard
Overhung,
Single Stage
Chemical Process
Pump**

The Standard for Chemical Processing

The Flowserve CPX process pump conforms to ISO 2858 dimensional and ISO 5199 design criteria. Offering state-of-the-art hydraulics, the CPX pump is designed for applications where high performance, high efficiency and low NPSH are required.

The advanced design and precision manufacture of the rugged CPX provide significant performance enhancing benefits that help users to maximize mean time between planned maintenance (MTBPM) and to reduce operating costs.

Applications

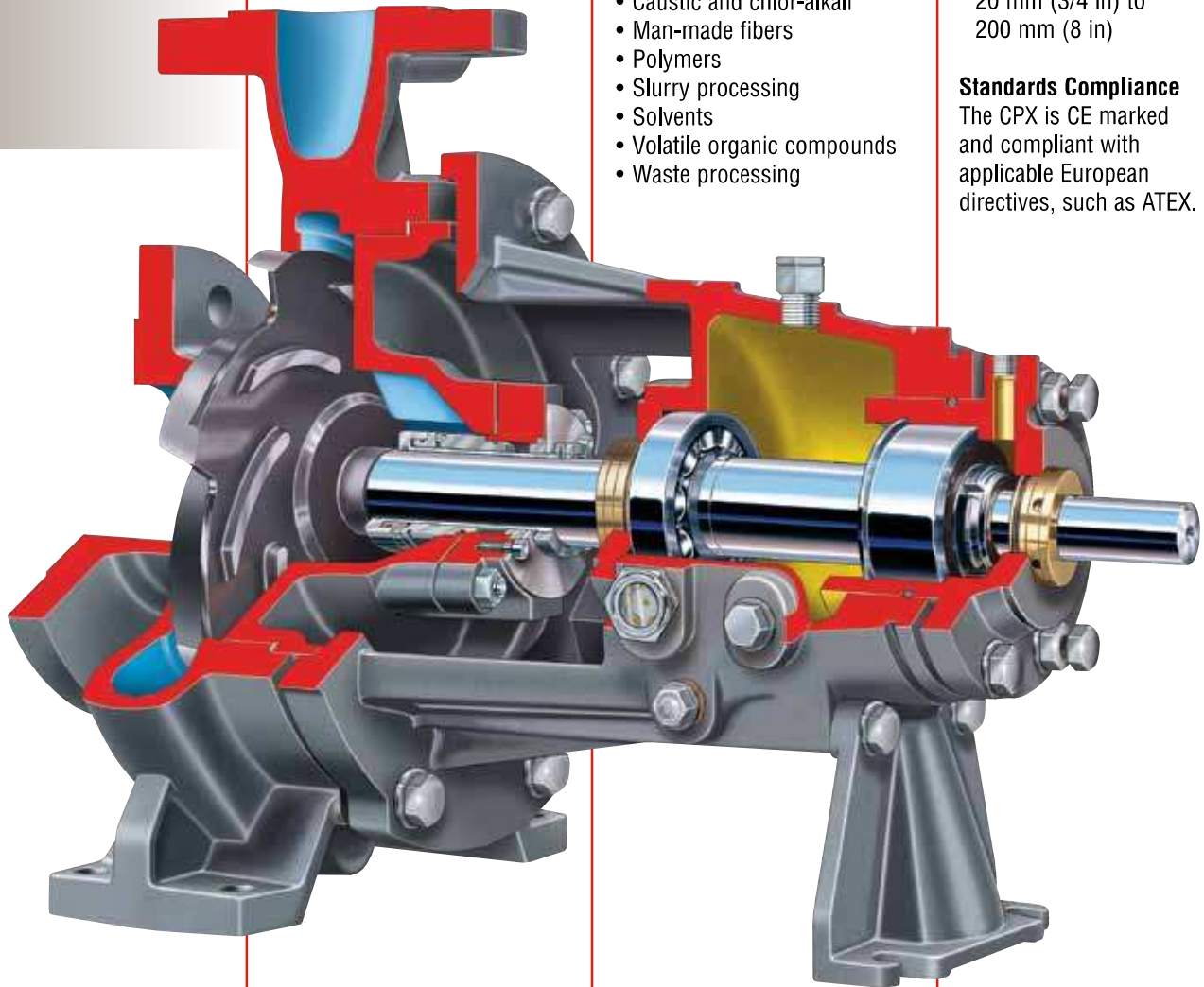
- Acid transfer
- Caustic and chlor-alkali
- Man-made fibers
- Polymers
- Slurry processing
- Solvents
- Volatile organic compounds
- Waste processing

Operating Parameters

- Flows to 1400 m³/h (6160 US gpm)
- Heads to 220 m (720 ft)
- Pressures to 25 bar (365 psi)
- Temperatures from -80°C (-110°F) to 350°C (660°F)
- Discharge sizes from 20 mm (3/4 in) to 200 mm (8 in)

Standards Compliance

The CPX is CE marked and compliant with applicable European directives, such as ATEX.



Advanced 45° Conical Seal Chamber with integral vortex flow modifiers increases mechanical seal life.

Standard Non-Contacting Labyrinth Seals keep lubricant in and contaminants out.

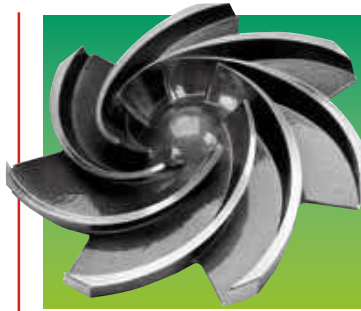
Heavy-Duty Pump End and Drive End Bearings selected for long life and reliability.

Heavy-Duty Casing with integral foot and multi-ribbed discharge flange provides superior resistance to pipe loads and improves reliability.

External Three Bolt Rotor Adjustment allows impeller clearances to be reset in situ, thereby restoring head and efficiency.

One-Piece, Ductile Iron Bearing Housing is designed for safety, maximum concentricity, strength and alignment.

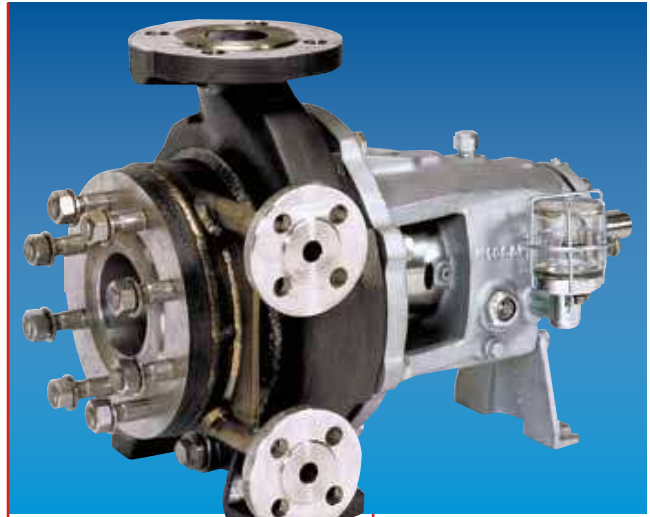
Back Pullout Design allows removal of rotating element without removing casing, piping or motor.



Precision Cast, Semi-Open Impeller delivers high efficiency performance and low NPSHR. Standard impeller material is Duplex stainless steel, the strength and hardness of which significantly extend the life of the impeller.

Benefits of CPX Semi-Open Impellers Versus Closed Impellers

- Adjustability of rotor enables head and efficiency to be restored in situ
- Improved solids handling
- Suitable for a wider range of applications
- Improved seal chamber environment in low NPSH applications
- Smooth entrance profile minimizes snagging of fibrous materials



Reliability and Performance Enhancing Features

- Precision cast, semi-open impeller with backvanes and shroud cutouts for axial balance reduces maintenance and downtime costs by extending mechanical seal and bearing life.
- Precision machined, metal-to-metal inter-connecting faces at the casing, seal chamber and bearing housing for reliable sealing and optimum concentricity.
- Robust, solid shaft ensures less than 0.05 mm (0.002 in) deflection at the seal face and low L³/D⁴ ratio, thereby extending mechanical seal life.
- Elimination of gaskets avoids leakage and crevice corrosion.

Optional Jacketed Casing

An optional jacketed casing is available for those applications in which the pumped fluid must be heated or cooled to maintain optimal fluid viscosity.

Low Flow Sizes

The CPX is also available in eight low flow, high head designs. Engineered specifically to cover flows lower than ISO 2858, these low flow pumps eliminate the need for throttling and the associated premature failure.

Additional benefits of low flow CPX pumps:

- Lower initial pump cost
- Smaller motor sizing
- Reduced energy costs
- Greater reliability

Additional Features

- Standard splash guard
- 3 mm (0.12 in) minimum corrosion allowance
- Magnetic drain plug
- Bull's-eye sight glass



**CPX
45° Seal Chamber
Technology**

**Advanced Technology
Seal Chamber**

The CPX 45° conically shaped seal chamber with integral flow modifiers is designed to redirect solids and slurry away from the seal, back into the flow path of the process liquid.

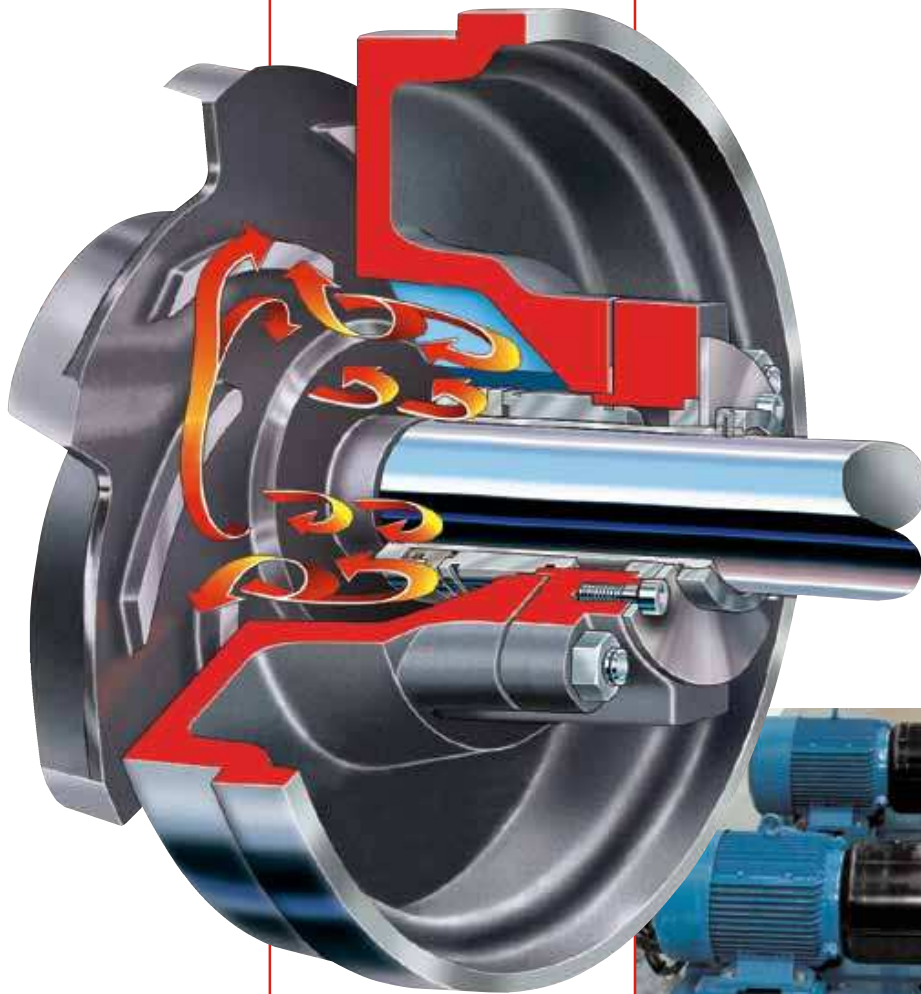
- Extends seal life
 - Self-venting
 - Self-flushing
 - Self-draining
- Reduces maintenance and repair costs
- Provides a safer environment for personnel
- Permits use of less expensive seal and flush plans
- Improves pump reliability

**45° Conical Seal Chamber
Provides Design Flexibility**

- Accommodates single, double and tandem seal arrangements
- Accepts single and double cartridge seals to latest ISO or DIN standards
- Accepts Eccentric Pumping Annulus (EPA) circulation system, a wide range of flush plans, and auxiliary systems for maximum reliability
- Provides optional jacketed seal chamber for effective heat transfer in the seal chamber area or across the entire surface area of the process fluid

**Flow Modifiers Extend
Mechanical Seal Life**

- Redirect flow from circumferential to axial, thereby reducing turbulence and abrasion
- The mechanical seal creates a centrifugal action, pushing suspended solids away from the seal faces and into the return flow created by the modifiers
- Solids and slurry merge into the returning flow path and are flushed out of the seal chamber
- Balanced flow with low pressure drop in the chamber helps keep solids in suspension, minimizing erosive characteristics



**Optional Integrated
Solid Seal Cover**

An integral solid seal cover eliminates crevices where corrosion could occur or where potential contaminants could collect, while reducing the parts count.



**CPX
Mechanical Seals**

The CPX 45° conical seal chamber accommodates many seal types including single, double and tandem arrangements.

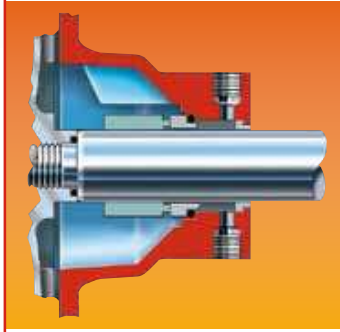
The double and tandem seals are available for more severe and environmentally sensitive applications.

All seals can be backed up by a range of flush plans and auxiliary systems.

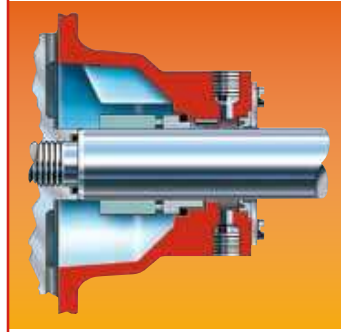
Conventional single and double cartridge seals can be fitted in accordance with the manufacturer's standard or with those designed to meet the latest ISO or DIN standards.

External seals and gland packing are optional, as is the seal housing jacket which controls the seal environment.

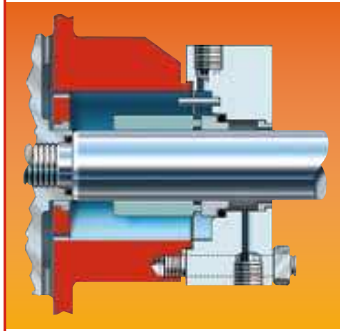
Single seal with external throttle bush and controlled drain



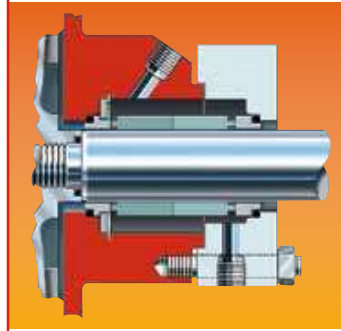
Single seal with external lip seal



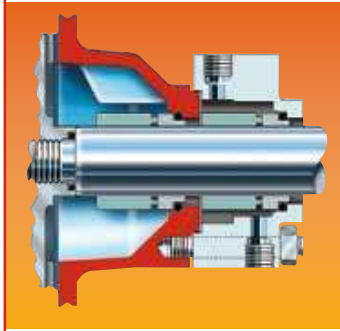
Single internal seal with internal PTFE neck bush and PTFE throttle bush



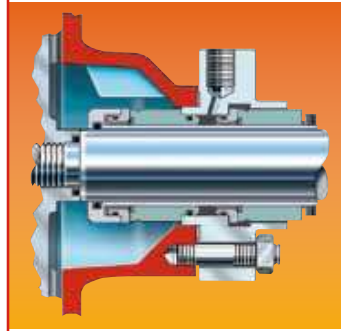
Double back-to-back seal with EPA circulation



Tandem seal with EPA circulation



Double cartridge tandem seal



**CPX
Heavy-Duty
Shaft and
Bearings**

CPX shafts and bearings are designed to improve pump reliability. The robust and stiff solid shaft ensures less than 0.05 mm (0.002 in) shaft deflection at the seal face and low L^3/D^4 ratio to maximize mechanical seal life.

Shaft Materials

To meet application requirements shafts are available in a wide range of corrosion-resistant materials, including:

- 316 stainless steel
- Duplex stainless steel
- Alloy 20
- Alloy C
- Alloy B

Bearing Options



As standard the CPX is supplied with a deep groove ball bearing and double row angular contact thrust bearing providing life in excess of the minimum specified by ISO 5199.

As an optional upgrade, the CPX can be supplied with a deep groove ball bearing and reinforced duplex, back-to-back angular contact thrust bearing, providing L10 bearing life in excess of 50 000 hours.



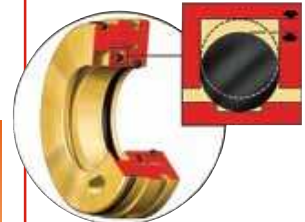
Oil Lubricated Bearing Housing “splash bath” uses bull’s-eye sight glass with magnetic drain plug as standard with constant level oiler as an option.



Grease Lubricated Bearing Housing facilitates maintenance by using grease nipples fitted at the pump end and drive end. Alternatively, sealed-for-life bearings can be fitted.

Additional Options

- Sealed-for-life bearings
- Additional condition monitoring points
- Tappings for instrumentation and monitoring equipment
- Bearing isolators – Standard or proprietary, non-contact designs
- Oil mist lubrication technologies



Optional non-contacting vapour block bearing isolators

CPX Parts and Materials

Flowserve Parts

Flowserve parts should be specified for all pump maintenance requirements.

In addition to improved maintenance savings only Flowserve offers:

- Parts that are guaranteed to fit, last and perform
- 24-hour emergency service
- Application and materials expertise
- Complete analysis and performance of your maintenance needs with recommended parts inventory and management, if so required



CPX Materials

Construction	Casing & Seal Housing	Impeller	Solid Shaft	Sleeved Shaft Option		Bearing Housing
				Shaft	Sleeve	
Ductile Iron	Ductile Iron	Duplex Stainless Steel	316 Stainless Steel	Carbon Steel	316 Stainless Steel	Ductile Iron
Carbon Steel	Carbon Steel					
304 Stainless Steel	304 Stainless Steel					
316 Stainless Steel	316 Stainless Steel					
Duplex Stainless Steel	Duplex Stainless Steel					
Alloy 20	Alloy 20	Alloy 20	Alloy 20	Stainless Steel	Alloy 20	
Alloy C	Alloy C	Alloy C	Alloy C		Alloy C	
Alloy B	Alloy B	Alloy B	Alloy B		Alloy B	

Flowserve foundries are widely regarded as among the world's best. They routinely pour alloys from common austenitic stainless steels to light reactive alloys such as titanium and zirconium.

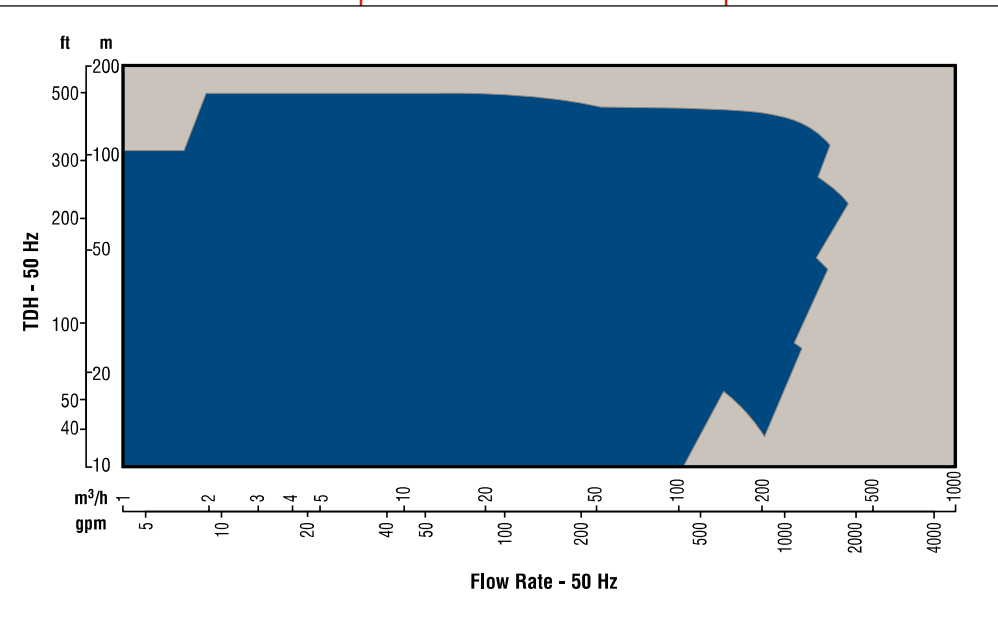
Attesting to the world class quality of its castings, Flowserve was the first high alloy foundry in the United States of America to have earned approval by Germany's Technischer Uber-wachungs Verein (TUV).



**CPX
Performance
Curves and
Standards
Compliance**

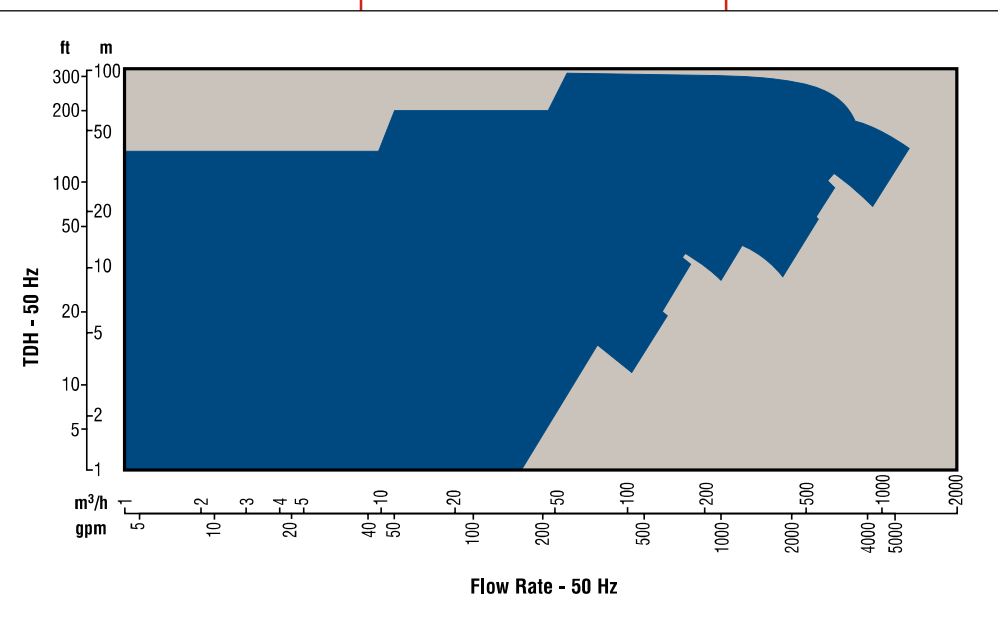
CPX Range Chart*

2900 rpm



CPX Range Chart*

1450 rpm



Standards Compliance



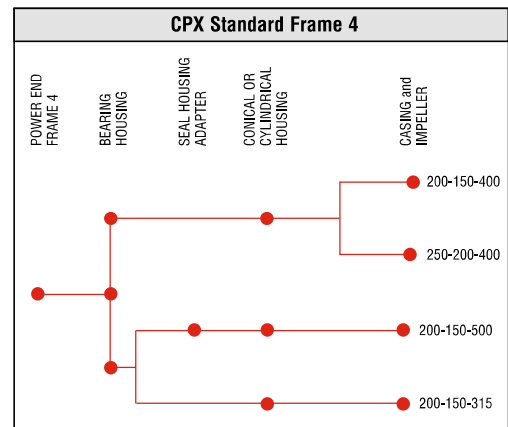
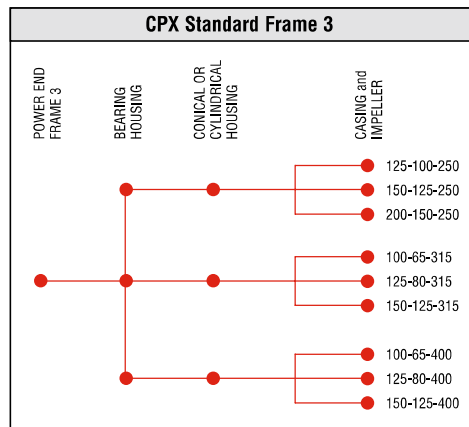
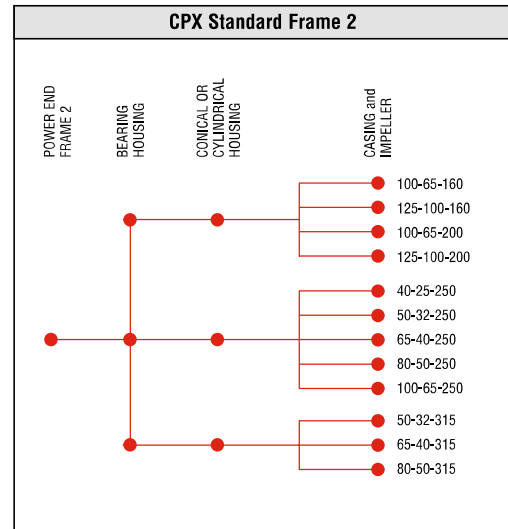
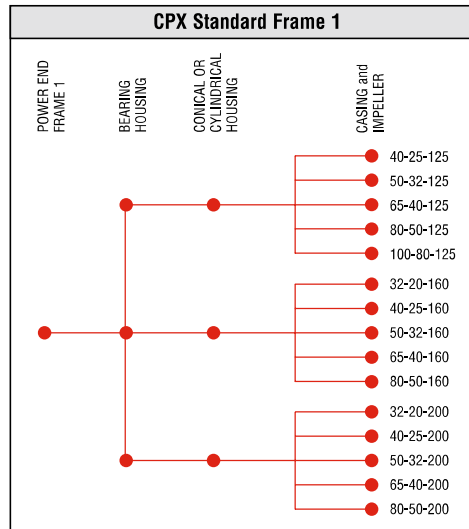
Compliant to the European ATEX Directive



Compliant to the European CE Directives

* Pumps can be used on 50 Hz or 60 Hz cycle supply

CPX
Interchangeability
and FlowSelex
Interactive Pump
Selection
Application



FlowSelex™
Interactive Pump
Selection Application

FlowSelex is a Web-based interactive pump selection program that allows users to access an extensive database of Flowserve pump sizing information anytime, anywhere.

This versatile tool delivers a wide range of information, from pump descriptions and operating parameters to custom application package



specifications with supporting technical documentation, including:

- Performance curves
- Hydraulic data sheets
- General arrangement drawings
- Construction data sheets

FlowSelex can be accessed at www.Flowserve.com/FlowSelex.