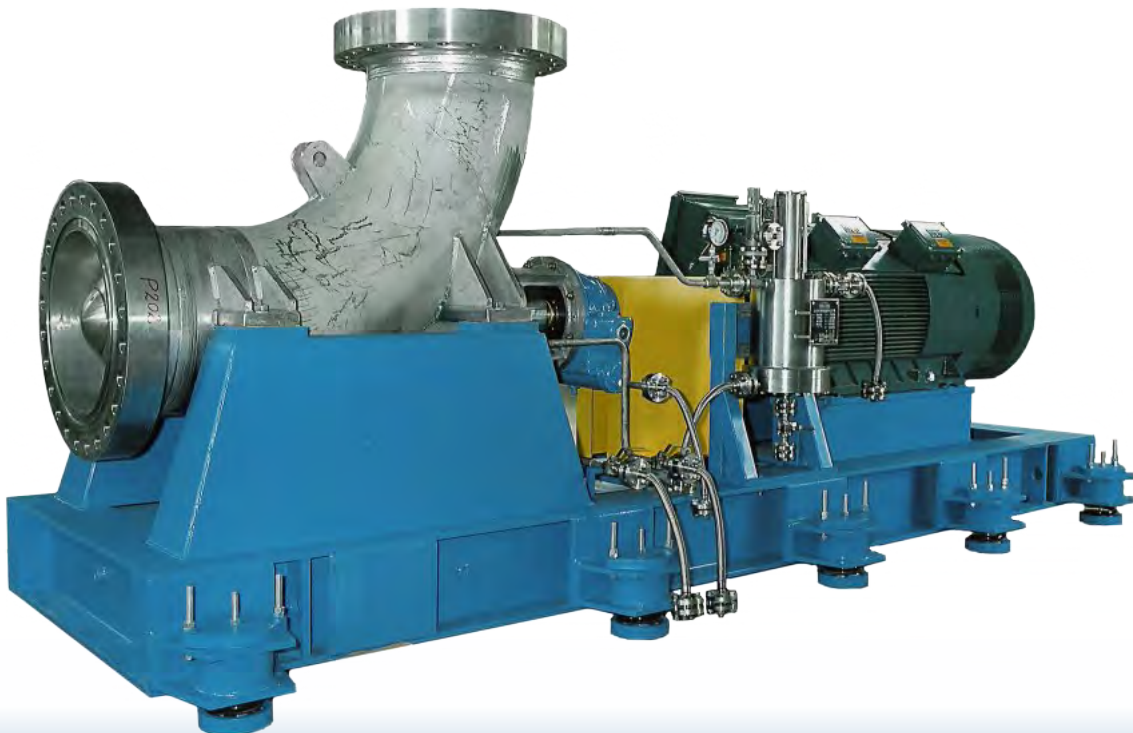


# POLYOLEFINS INDUSTRY



**Making Progress Together**

 **Ensival Moret**  
A Moret Industries Company



[www.ensival-moret.com](http://www.ensival-moret.com)



# ENSIVAL MORET : WE PROVIDE SOLUTIONS

With over 140 years of pump design and manufacturing experience, Ensival Moret has become a global supplier of choice in the energy, chemical, petrochemical, navy, food and beverage industries. Ensival Moret is well known among customers for its skilled support and expertise in specific pumps and pumping systems.

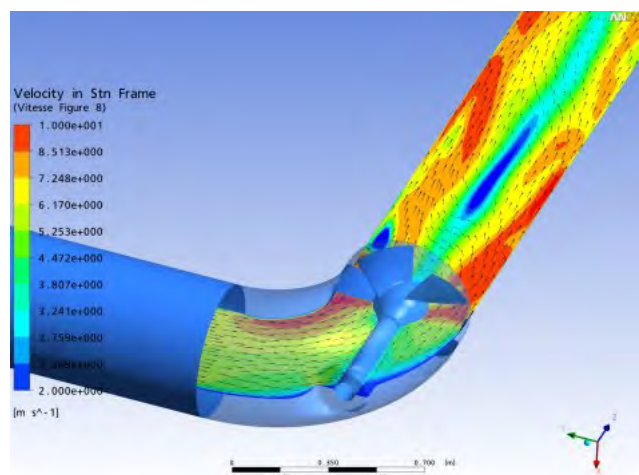
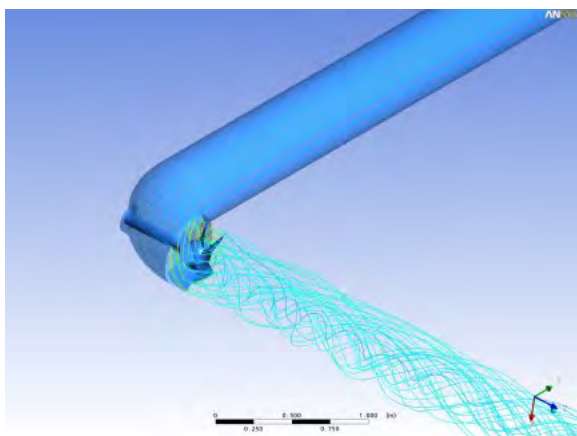
Today, thanks to constant collaboration with its customers, Ensival Moret is able to guarantee a high-quality equipments and rapid prototyping.

Based on our own experience, we provide reliable and tailor made technical solutions and high-quality equipments. With pumps flawlessly operating, we have proven our superior technical solutions, pump reliability and high efficiency. Ensival Moret supplies one of the most critical components in polyolefins process : the axial flow circulator pumps for loop reactor.

Our priority is the customer satisfaction and the fit for purpose solutions in critical and highly technical pumping scheme.

Ensival Moret takes responsibility for the complete pumping system. Its highly engineered design, quality manufacturing and focused customer support lead to minimum pump life cycle cost, high efficiency and reliability.

Ensival Moret continually works on improving effective solutions with strong focus on Innovation and Research & Development efforts.





# Loop Reactor Circulation Pump For Very High Pressure

**/** The high pressure AH loop reactor circulation pump is specifically designed for the loop reactor in slurry processes. These critical pumps are well suited to the circulation of slurry due to the large free passage between two adjacent blades. The influence of solids content on the pump performances is also reduced in comparison with conventional centrifugal pumps.

**/** Ensival Moret knows your process needs to be in a constant state of efficiency. As the pumps are critical items in the process and spares cannot be installed, we provide axial flow pumps achieving an expected maintenance interval of 5 years in severe working conditions. Our pumps are designed and built to last.

## **/ Installation options :**



**/ Spring supported pump :** common base plate for pump and motor with springs to allow the thermal expansion of the loop reactor.

**/ Hanging in the piping :** the pump is hanging in the piping with a cardan shaft between the pump and the motor. The motor is installed on a base frame rigidly connected to the ground.



## **/ Operating Capabilities :**

- Flow up to 18000 m<sup>3</sup>/h (79260 US gpm)
- Head up to 45 m (148 ft)
- Operating temperatures from -45 °C to 200 °C (-50 °F to 392 °F)
- Design pressure up to 100 bar (1450 PSI)
- Higher flows and heads upon request

## **/ Materials :**

- Casing / Propeller : LTCS, S304L or 316L
- Shaft : 42CrMo4 Steel, S304L or duplex stainless steel 22/6/3
- Other materials available upon request

## **/ Flanges :**

- Flanges following customers specifications



# Axial Flow Pump Design

## / Seal configuration :

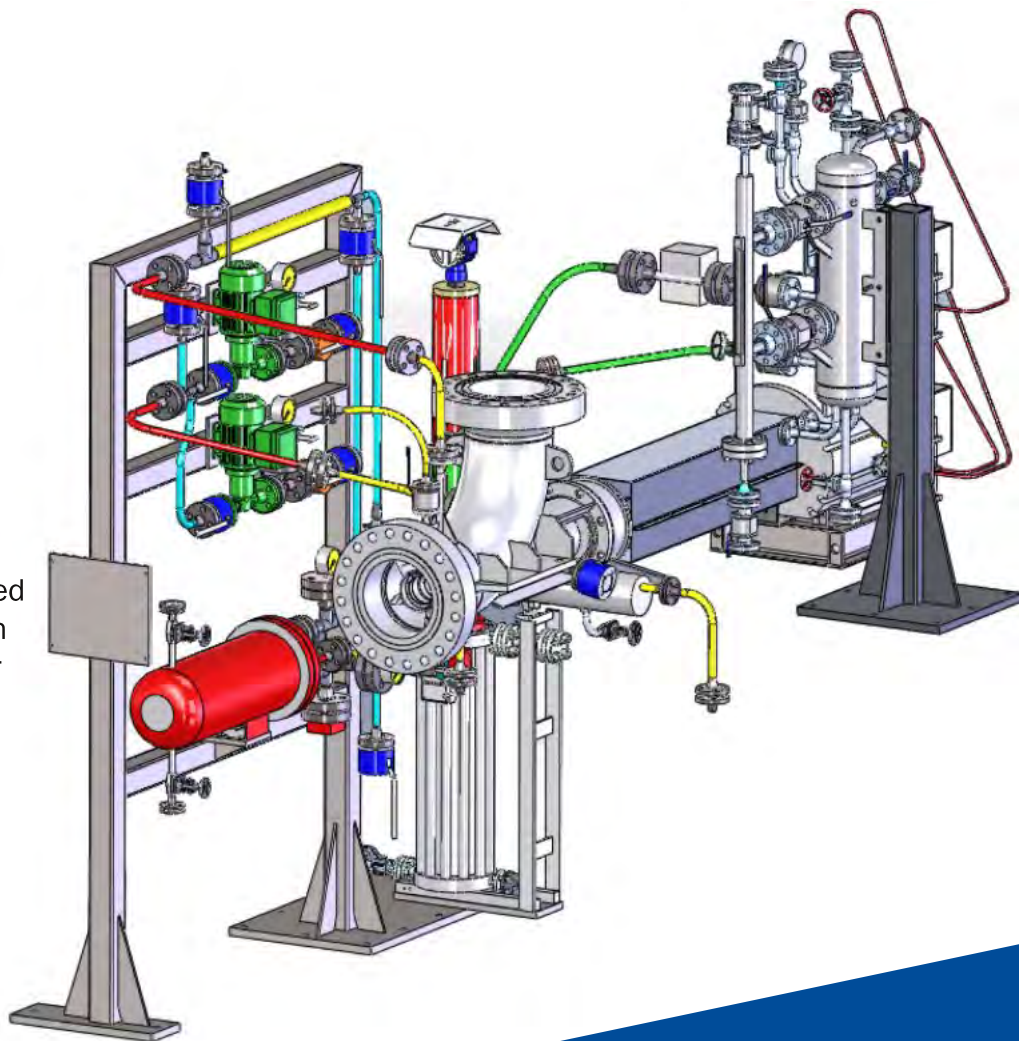
/ Due to the pressure fluctuations that may occur in the pump, it is essential that the design of the seal is kept high in order to ensure long term reliability. Ensival Moret is closely working with its suppliers in order to target a minimum service and a 5 year life expectancy. The seal configuration is designed in order to provide a higher safety level. Double or triple mechanical seal design are available with all constructions. All our mechanical seals are designed to handle the system pressure in the event of primary seal failure.

## / Double mechanical seal :

- With the overhung impeller or bush bearing construction
- API plan 32 + 53C
- API plan 32 + 52

## / Triple mechanical seal :

- API plan 32 + 53C + 52
- Triple mechanical seal composed of a single mechanical seal with antifriction bearing on propeller side and a double mechanical seal on drive side
- Triple mechanical seal on drive side





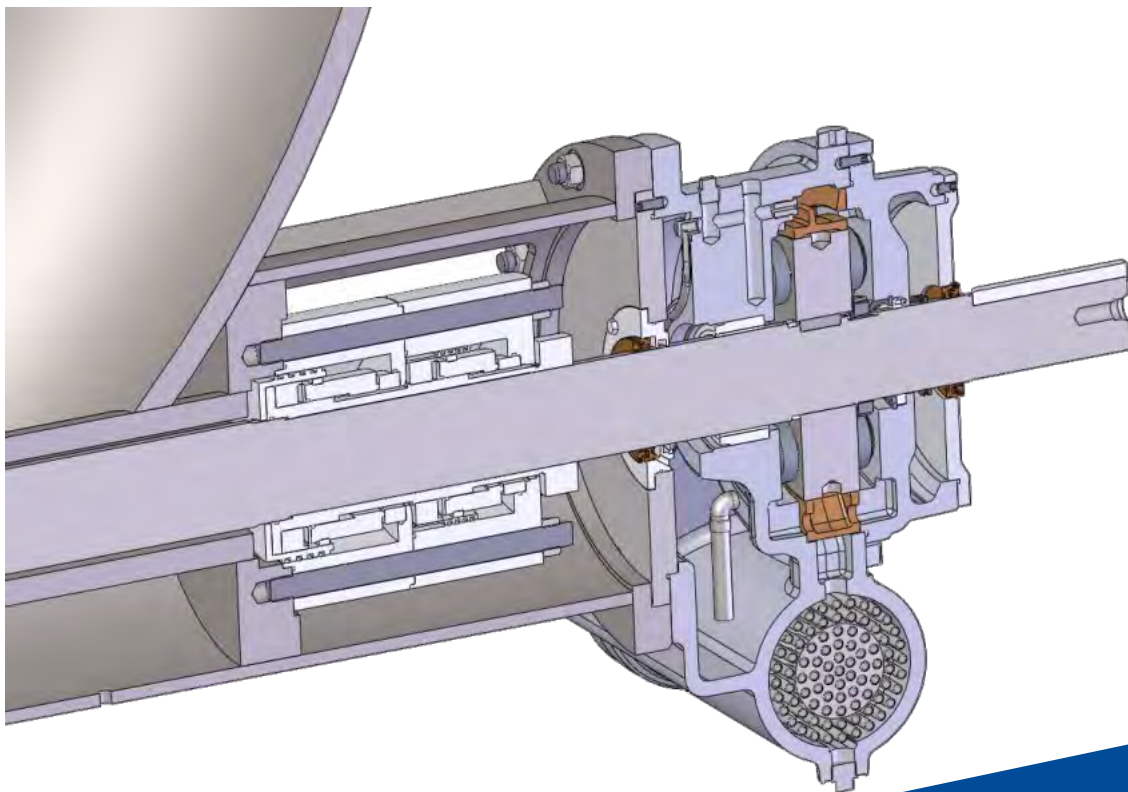
# Axial Flow Pump Design

## **/ Bearing construction :**

- Ball bearings for pump size < 12 inches
- Thrust bearing by tilting pads with integrated exchanger.

**/** The thrust bearing includes a bush bearing lined with babbitt (antifriction metal) supporting the shaft radially and a thrust disk rotating between the two sets of babbitt-lined tilting pads positioning the pump rotor axially and taking up the high axial thrust.

**/** This thrust bearing is fitted with an autonomous oil pump, the rotor of which is the thrust disk, while the ring surrounding this thrust disk acts as the stator. A water/oil exchanger ensures the oil cooling.





# A Complete Package Solution

/ Ensival Moret is offering a comprehensive range of API pumps. Ensival Moret pumps complying with the API610 latest edition are designed for extreme conditions. They are used extensively in refineries, petrochemicals, offshore industries, geothermal power and thermal power station.

## / PRE pumps (Type OH2) :

The PRE pump is offering a high efficiency and reliability. PRE pumps cover a wide range of flow rates with more than 70 sizes.

## / Operating Capabilities :

- Flow up to 6000 m<sup>3</sup>/h (26417 US gpm)
- Head up to 320 m (1050 ft)
- Design pressure up to 50 bar (725 PSI)
- Higher design pressure upon request

## / PRERSF pumps (Type OH2) :

The PRERSF pump is designed with a reinforced construction with semi-open impeller guaranteeing an excellent efficiency and reliability at high pressure. The PRERSF is well suited for slurry and also gas phase processes.

## / Operating Capabilities :

- Flow up to 6000 m<sup>3</sup>/h (26417 US gpm)
- Head up to 250 m (820 ft)
- Design pressure up to 100 bar (1450 PSI)
- Higher design pressure upon request





# A Complete Package Solution

## **/ PRD & PR2M Between-bearings pumps (Type BB2) :**

Complying with API 610, Ensival Moret between bearings pumps with radial split casing are well suited for operating at very high temperature.

### **/ Operating Capabilities - PRD pumps :**

- Flow up to 2800 m<sup>3</sup>/h (12330 US gpm)
- Head up to 320 m (1050 ft)
- Design pressure up to 80 bar (1160 PSI)
- Operating temperature up to 425 °C (800 °F)
- Higher design pressure upon request

### **/ Operating Capabilities - PR2M pumps :**

- Flow up to 500 m<sup>3</sup>/h (2200 US gpm)
- Head up to 500 m (1640 ft)
- Design pressure up to 80 bar (1160 PSI)
- Operating temperature up to 425 °C (800 °F)
- Higher design pressure upon request

## **/ MNF Multistage pumps (Type BB5) :**

Ensival Moret multistage pumps offer reliable design for operations at very high pressures. The MNF pump is designed with case barrel (type BB5) complying with API 610.

### **/ Operating Capabilities - MNF pumps :**

- Flow up to 500 m<sup>3</sup>/h (2200 US gpm)
- Head up to 1200 m (3940 ft)
- Design pressure up to 260 bar (3770 PSI)
- Operating temperature up to 220 °C (430 °F)
- Higher design pressure upon request



# Making Progress Together



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