

FLUOROCARBON LININGS

FLUOROLINE®

ARДУА® PUMPS

Ardua® pumps are designed for extremely corrosive duties primarily within the pharmaceutical, intermediates and fine chemical industries. These pumps have proved their technical excellence for over 20 years and are currently in use in more than 30 countries around the world.

Ardua® pumps are robust, simple and reliable. This range of pumps has been created to handle any corrosive fluid or combinations of corrosive/abrasive fluids up to 150⁰ C. The pumps are available in a series of basic forms, including close coupled, simple pedestal, and back pull out pedestal to meet the requirements of API 610. A range of proprietary seal systems is offered, but any seal system or seal combination may be incorporated. The patented Ardua® liquid ring seal is also available

The advantages of Ardua® pumps over all other types are that they are designed specifically for corrosive and corrosive/erosive duties, and are able to handle slurries containing up to 25% solids. As a result of the unique corrosion resistance of Ardua® pumps, units, which are purchased with one specific service in mind, may, with little or no modification, be successfully used for entirely different corrosive fluid duties, as the need arises. Ardua® pumps are frequently provided skid mounted so that they can be easily relocated within the user's factory.

A further advantage of Ardua® pumps is that all standard units are backed by a comprehensive spares service, with many spare parts being interchangeable across a wide range of linings and styles.

Ardua® pumps are compatible with the entire range of Fluorocarbon Co.'s Fluoroline® pipework systems.

The Ardua® 'F' range is a standard range of mechanically driven lined centrifugal pumps, which has been developed to handle all corrosive pumping duties within the performance envelope of 1000 gpm by 225 ft head.

The 'F' range features a series of cast S.G. iron/steel components which are lined with fluoropolymers and exotic metals; typically perfluoroalkoxy (PFA), Polyvinylidene fluoride (PVDF), Hastelloy, titanium, zirconium, nickel, stainless steel, and in certain cases tantalum. The fluoropolymer lining is manufactured by means of injection moulding into and around the iron/steel reinforcement, producing a continuous corrosion proof lining without joint or weld, and having a thickness of between 4mm and 6mm. The exotic metallic linings are fabricated within and around similar reinforcements, from wrought sheet material, and are subsequently back filled and bonded to the reinforcement by means of epoxy resin. The components produced by either route are completely interchangeable.

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The impeller is of the open 'Bask' design, having up to four blades. The fluoropolymer-lined pumps have an impeller and shaft sleeve moulded around a steel core as a single component. All metallic lined pumps have impellers and shaft sleeves machined from solid wrought exotic metal.

Where the seal components are fixed to the backplate and the shaft sleeve respectively, and slip takes place between two seal faces, the shaft sleeve can be fluoropolymer, with the impeller/shaft sleeve being of monobloc construction. Where a sealing component slides on the surface of the shaft sleeve, the impeller is an assembly of impeller and shaft sleeve, with the sleeve being made from a suitable metallic material. The 'F' range features a standard range of proprietary seal systems, but is readily adaptable to alternative systems.

The 'F' range pedestals are cast from grade 17 cast iron and are extremely robust, using heavy duty ball and roller bearings, constant level oiler systems, magnetic drain plugs and breathers.

The most important feature of the 'F' range pump design is that of the iron/steel reinforced corrosion resistant linings in the pump head. The entire pump head is supported by means of its S.G. iron cast front housing and steel backplate. All nuts, bolts and studs bear upon, and are located in, ferrous materials. The positioning of all components relative to their neighbours is by metallic locating features. The shaft seal seat is rigidly supported by the one piece machined steel backplate. In addition, impeller running clearances are fixed by a jig -positioned taper drive pin fitted through the impeller shaft sleeve and driveshaft, which is remote from the pumped fluid.

The composite construction gives the pump great mechanical strength, allied to unsurpassed chemical resistance, and an ability to withstand considerable internal damage to linings without exposing the metallic structure to the pumped fluid.

The Ardua® 'T' range of pumps consists of solid pumps produced to meet special requirements, using as many standard 'F' range components as possible. The 'T' range pumps can be manufactured from any available wrought exotic metal or alloy, and solid fluoroplastics such as PTFE, and from solid epoxy and polyester resins. Ardua 'T' pumps, fitted with special shaft seals, are available for cryogenic temperature service.

All Ardua® horizontal pumps can be supplied as self-primers. The self-priming system is simple, involving two reservoirs, one at the suction end and the other at the discharge end of the pump. After initial priming of the reservoirs, liquid and entrained air or vapour is pumped from the suction reservoir into the discharge reservoir. Here the air or vapour is released into the discharge line, and the liquid is re-circulated into the suction line. Thus air or vapour is discharged from the suction pipe. The liquid level progressively rises in the suction line until it discharges into the suction reservoir and floods the pump. The reservoirs and associated fittings are constructed from the same corrosion resistant materials as the pump.

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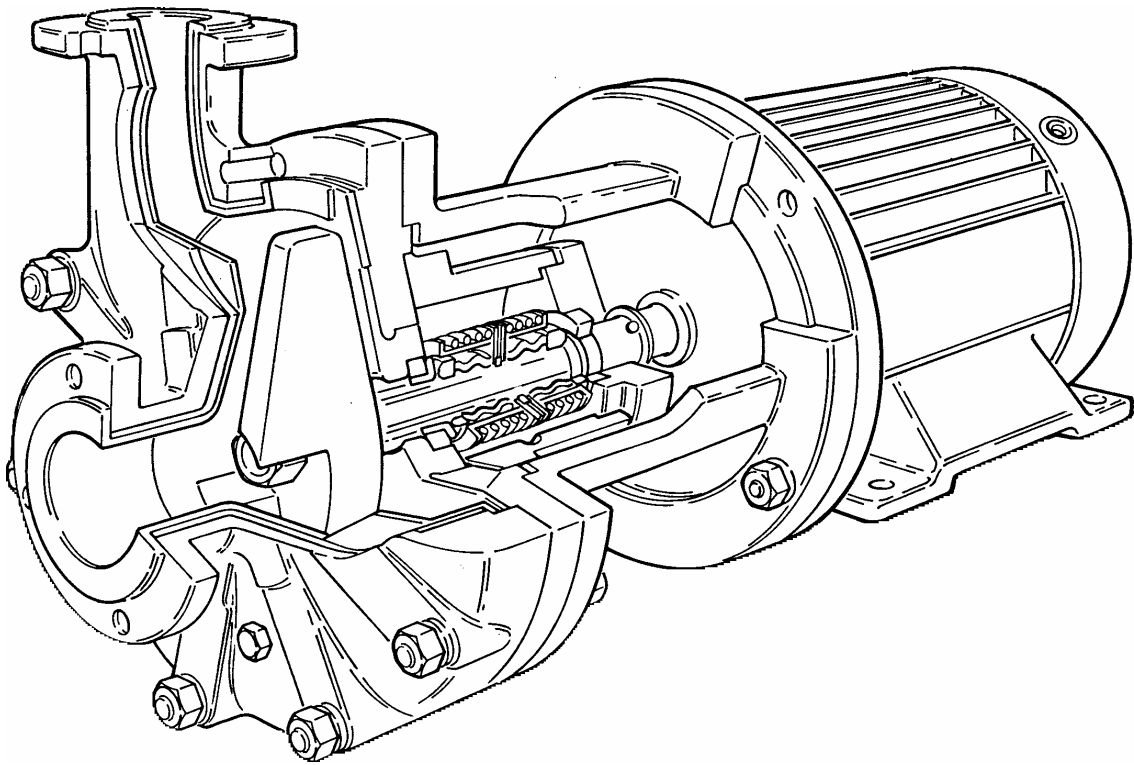
ARDUA® PUMPS

Close Coupled

In this design, the impeller is driven through a motor shaft adaptor coupled directly to the electric drive motor.

The pump head is supported by a rear housing bolted directly to the motor flange.

The pump is supported by the motor feet, bolted to the foundation, or alternatively to a fabricated steel baseplate.



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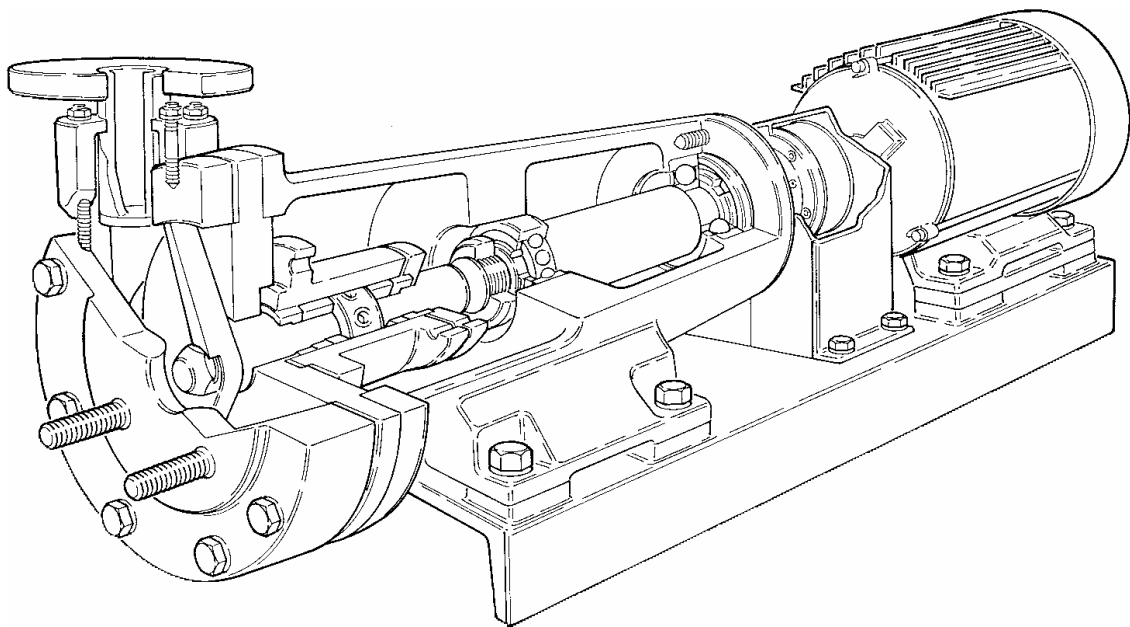
Simple Pedestal

In this design, the drive is taken via a flexible coupling from the motor through a drive shaft supported in pre-greased bearings in a cast iron pedestal.

The pedestal (drive) shaft fits into the impeller shaft, and drive is transmitted through a tapered locking pin.

The pedestal bolts directly to the pump head.

The pedestal and motor are bolted to a steel baseplate.



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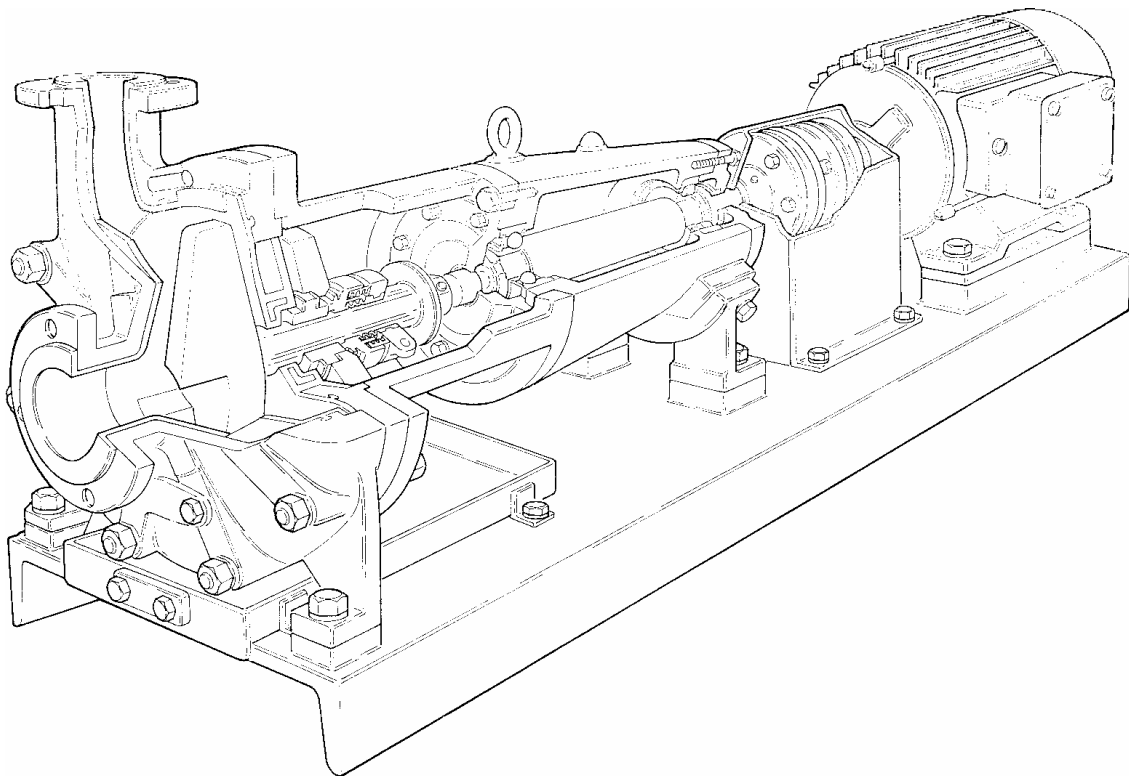
Back Pull Out

The motor drive is taken via a spacer coupling and rubber tyre to the pedestal shaft, which is supported in a cast iron pedestal by splash-lubricated bearings.

The pedestal is attached to the pump head by a separate rear housing.

The pedestal shaft drives the impeller through a taper locking pin.

With this design, it is possible to service the impeller, seal system, and pedestal bearings without disturbing electrical connections to the motor, or process pipework to the pump head.

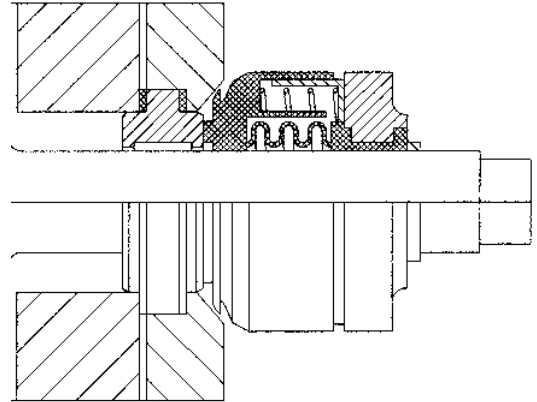


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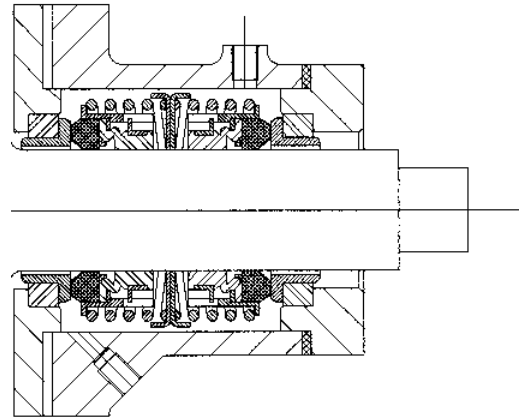
Installation of a single PTFE bellows seal.

These seals are used on highly corrosive clean liquids. They are not suitable for fluids carrying solids.



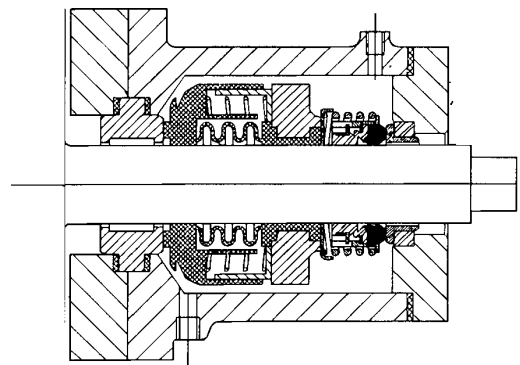
Installation of twin PTFE wedge seals

These require a suitable fluid supply, usually from a pressurised recirculation system containing fluid that is compatible with the process.



Double bellows seal

These feature a PTFE bellows seal inboard, with a rubber bellows seal mounted back to back, and are flushed with a fluid compatible with the process.



Ardua® pumps have also been fitted with gas seals and cartridge seals.