Cold Isostatic Press System CIP-ISOPLANT

Overview 1

During cold isostatic pressing, any desired object (powder-filled elastic moulds) are compacted by means of an isostatically (i.e. from all sides) effective pressure medium. Thus, the compacted material is of homogeneous and high density.



A liquid (usually water with an additive) at room temperature is used as pressure transmitting medium at pressures between 300 and 6000 bar depending on the application.

Product Examples 2

CIP technology application examples are:

- **Fireproof ceramics**
- Oxide ceramics
- Transparent ceramics
- Graphite
- Carbides
- Superalloys
- **Synthetics**

Isoplant System З

The Isoplant system is designed for efficient medium to large scale production.

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Its foremost distinction lies in a fully automatic process cycle. In addition to closing and opening the pressure vessel, the automatic positioning of the closing frame permits loading and unloading of the mould basket via integrated lifting device.



The technical process linkage of further system components, such as mould filling, washing station, evacuation etc. ensures maximum productivity and reliability - today a must in a modern industrial enterprise.

The large useful volume of the Isoplant line is adaptable to many applications due to its flexibility. Moreover, it is possible to load a variety of moulds of different sizes simultaneously.

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4 Multiplier Features

Pressure is built up by means of a hydraulically driven piston, which is the core component of the so-called multiplier.

The piston or rather the multiplier transmits (multiplies) the hydraulic drive pressure of max. 500bar to the desired press water pressure inside the recipient (up to 6000bar). The ratio between the oil-side surface and the water-side surface of the piston determines the transmission ratio between oil pressure and press water pressure. This allows relatively low hydraulic pressure generating very high pressure on the press water side.

Our system has various decisive advantages for the operating company in comparison to systems in which press water pressure is generated directly by high-pressure water pumps:

Operation, Maintenance, Service

As the complete drive technology is compiled of standard oil hydraulic components, the system according to industrial standards is extremely robust, durable, and well maintainable for the operator.

As no special high-pressure components are used, any industrial hydraulic service should be able to perform replacement and maintenance works.

Control Accuracy

The process pressure control accuracy is excellent and reliable as different renowned manufacturers fall back to fully developed servo valve technology.

Production Reliability due to Media Separation

The multiplier serves as a firm media separator: while the drive side operates under oil, the process side operates under press liquid. Both media are highly suitable for their specific operation purpose - and this solely and exclusively. Therefore, our system separates both media from each other as a principle.

There are many reasons for this:

Water is suitable for high-pressure operation to an excessively limited extent due to its poor lubrication properties.

Therefore, high-pressure water pumps and especially their interior guides and seals are of highly elaborate design than oil hydraulic pumps to make them resistant against the corrosive and abrasive effect of the water.

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Generally, for all other water fittings, e.g. valves, there is a very small selection on the market regarding function, nominal size, and alternative fabrications. This is explained by the properties of water and by the high operating pressure itself. Since in a system with direct pressure build-up, all components bear the extremely high water pressure load (commonly 2000bar), while in oil hydraulics, there is a maximum of 500 bar.

The most important argument against direct press water pressure generation is its sensitivity against press water contamination.

In everyday CIP operation, it is unavoidable that e.g. powder residues sticking on the outside mould of the pressing tool enter the press water. Trace amounts of impurities cause premature malfunctions of valves and wear of moving pump parts. The level of press water clarity required by pump and fitting manufacturers is unattainable in daily Cold Isostatic Press operation - even under application of all possible preventive measures. Anyway, permanent press water filtering is a minimum duty, which causes increased plant operating efforts. Such filter systems are not required in our multiplier design because this principle prevents press water as well as its impurities entering the hydraulic system.

The foregoing arguments raise the question, why hydraulic oil is not also used as the medium transmitting pressure to the batch.

Oil is unsuitable for this purpose because openly handling it is intolerable for plant operators due to safety and practical reasons. Furthermore, draining oil would cause severe soiling of the plant environment in very short time.

Consequently, using an oil hydraulic system as a drive and press water as a pressure transmitting medium and separating both sides from each other is the proper approach. In our plants, it is the standard solution.

CREMER HIP Innovations GmbH Auf dem Flabig 6

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Tandem System Version 5

The tandem system version of the Isoplant CIP allows considerable capacity increases.

Here, the system is equipped with an addition recipient.

While one recipient gets loaded or unloaded, the other recipient is under pressure. As soon as pressing in the first recipient and loading of the second recipient is finished, the closing frame is driven to the second position. The second recipient starts pressing.

Thus, the capacity of a single line can be nearly doubled. The retrofitting capability of a standard Isoplant line may be provided if the customer requires so.



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Plant Model 6



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