Inverting Filter Centrifuge Series HF
A company with a long tradition
HEINKEL is a supplier of filtration and drying machinery and equipment. Their functionality, design and construction follow an integrated approach: customized, durable, cost optimized, and efficient.

A powerful group of companies
HEINKEL realizes part or full concepts for chemical synthesis plants. Individual modules are aligned, interfaces to other modules defined, and standard automation philosophies developed. The equipment is tested and fully documented to achieve a quick and trouble-free commissioning on site.

An innovative developer
HEINKEL manufactures machines and equipment for the filtration of solids in the chemical-pharmaceutical industry, the fine and special chemical industry, the food industry, as well as the recycling and environmental industries: even for extremely difficult filtering products.

A competent partner
HEINKEL offers customized service concepts and guarantees for their spare parts deliveries as well as repairs: around the clock, worldwide.

Core competence:
– Solids/liquid separation
– Manufacturing of centrifuges
– Concepts for solids separation
– Combined concepts including centrifugation and drying
– Automation concepts for centrifuges and separation systems
The core design upon which our reliable and robust design was based is discharging separated products by inverting the filter cloth is at the heart of our technology to-day. HEINKEL Inverting Filter Centrifuges have been used in numerous applications to separate high quality solid materials. Continuous research and optimization of the centrifuge and its associated sub-systems are the foundation of today’s very high quality standard.

In order to fulfill the demands of the pharmaceutical industry, HEINKEL has eliminated hydraulic systems with Inverting Filter Centrifuge design. Industry standards including cGMP or GAMP have been recognized and used as the guide for our design team. Our achievements include the development of industry leading CIP systems and accessibility through the development of fully moveable housings.

Through its completely sealed process chamber and fully automated, uninterrupted mode of operation; HEINKEL Inverting Filter Centrifuges fulfill the highest safety standards and guarantee maximum safety for the operating personnel, the environment and the product.

The safety level of a HEINKEL Inverting Filter Centrifuge always conforms to current regulations. We strive to set centrifuge technology standard.
The Inverting Filter Centrifuge principle
Technology for optimum efficiency

**Filling**

The slurry (liquid stream containing solid to be separated) is delivered to the process chamber which is a rotating drum a feed pipe. The filling step is usually controlled through a load cell based weight control system optionally control can be by time or volume.

**Spinning**

The drum spins at a pre-set value chosen from the speed range of the individual machine. The filtrate passes through the filter cloth which lines the process chamber and the solids collect and build up on the filter cloth to form a cake of material.

**Washing**

Wash liquid is introduced and controlled in the same manner as the slurry. Due to the homogeneous cake build-up each part of the solid cake will be washed to the same quality.

**Discharging**

The separated solids are discharged by inverting the filter cloth through the axially movement of the shaft, while the bowl remains rotating at a low speed.
Advantages

- Homogeneous cake build-up
- no compression of the solids cake
- homogeneous drainage results
- no vibration
- optimum filling process.

- High rotational speeds during spinning with maximum drum load possible
- homogeneous drainage results
- fully flexible process recipe management.

- Homogeneous washing results through the even cake structure
- comparatively low consumption of wash medium and reduce amounts of post process wash filtrate to be processed.

- Product protected during discharge (no damage to crystal structure)
- no residual heel
- no manual emptying of the drum and opening of the process housings necessary
- clean filter cloth for the next filling process.
An overview of the advantages
Innovative Technologies for your success

Discharging by inverting the filter cloth
No discharge hardware to cause damage to crystal structure of isolated product.

Efficient CIP-Systems
Fully automated, validated cleaning through efficient CIP systems with optional housing flooding facility.

Feed pipe
Feed-pipe blow down facility to ensure product and wash is completely delivered.

Guaranteed solids discharge
Guaranteed solids discharge without any residual heel unaffected by the solid characteristics.

Minimal horizontal surfaces
A minimum of horizontal surfaces prevent product deposits.

Gas-tight process chamber
No product or solvent emissions guaranteeing safety for operating personnel and the environment.
**Separation of process room and machine part**
Design facilitates separation of process chamber.

**Electromechanical axial drive**
No axial forces on the main bearing, therefore high bearing lifespan and minimized downtime of the machine.

No hydraulics for axial movement. No product contamination by hydraulic oil.

System inherent safety to prevent accidental opening of the drum.

**Filling control**
No hardware in the product area and to damage to the product or to be damaged by the product.

**Instrumentation**
Completely in accordance with current regulatory requirements of each country.

**Run with very low vibration**
No vibration therefore installation on metal framework or directly on to a floor possible.
Certifiable cleaning of the Inverting Filter Centrifuge HF is effectively carried out in a closed condition through fully automated CIP-cleaning systems. Product change-over is quickly and easily completed.

Contamination of pharmaceutical systems will effect product quality and potentially the patient. HEINKEL Inverting Filter Centrifuges are constructed so that cleaning and inspection can be carried out easily.

**Features**
- automated, certifiable cleaning in a closed condition
- clean room installations
- easy access to all machine parts that come in contact with product
- minimum surface roughness of areas that come in contact with product
- use of materials and gaskets designed for the pharmaceutical industry
- avoiding potential sources of contamination

Certifiable cleaning of the Inverting Filter Centrifuge HF is effectively carried out in a closed condition through fully automated CIP-cleaning systems. Product change-over is quickly and easily completed.

All process housings can be opened easily for immediate inspection. Ease of access to housing surfaces that come into contact with product. Ease of access for maintenance. No disassembly required for cleaning or inspection.

HEINKEL Inverting Filter Centrifuges are QHD (Qualified Hygienic Design) tested.
We understand the additional demands on the pharmaceutical ingredient manufacturer with regard to qualification / validation.

Control Technology

- We understand the control of the centrifuge needs to be adaptable to individual process requirements.

Features

- We understand the control of the centrifuge needs to be adaptable to individual process requirements.
- We understand operator requirements and include these in the screens available through the operator display.
- Complete and flexible recipe management is standard.
- Flexible interface to the full range of plant control systems.
- The operator panels for installation in potentially explosive environments.
- HEINKEL control systems can be carried out as stand-alone variations or as sub-systems of more complex control systems of the customer.

Quality Management

- HEINKEL has built up an extensive quality management system in accordance with the recommendations of the GAMP forum for project handling and has implemented it into HEINKEL's already existing quality protection system. Today this allows us to assure that the customer's criteria are defined, considered during construction and production and can ultimately be fulfilled and verified. Verification is confirmed through GAMP compliant documentation.

HEINKEL supports its customers worldwide during the Installation Qualification (IQ) and Operational Qualification (OQ) of their systems through the production and implementation of compliant documentation by qualified personnel.
HEINKEL Inverting Filter Centrifuges are an essential part of a complete production system. HEINKEL developed support systems and features to enhance the benefits Inverting Filter Centrifuges in a modular form to enable them to be readily integrated into existing installations.

The modular PAC®-System can be delivered as part of original supply or as an add-on feature for the HEINKEL Inverting Filter Centrifuge to expand its area of application.

The PAC®-System makes it possible to pressurize the process chamber inside the drum with a gas pressure of up to 6 bar.

The HYPERCENTRIFUGATION® process produces lower residual moisture accelerating the dewatering of the solids increasing product quantity and quality.

Products which could not previously be separated using centrifuge technology can now be separated effortlessly through the HYPERCENTRIFUGATION® process.

During the isolation of pharmaceutical substances, pharmaceutical pre- and intermediate levels as well as special chemicals, there are processes used (among others) that combine both the steps “filtration” and “thermal drying”.

The PAC®-Modules by HEINKEL are the technical solution for this. The separated solid substance is dried in the centrifuge drum prior to discharge as a free flowing granular material.
HEINKEL Gas Recirculation Systems HG enable operating costs to be reduced to a minimum and to eliminate environmental pollution by solvents and their fumes.

HEINKEL understands the challenges product handling can present to our customers and provides a range of solutions to accommodate the requirements of individual installations and processes.

Our turn-key systems were developed with our customers to satisfy their installation and process needs. We begin with the filling system and supply filtrate and solids handling systems all supported by required documentation and technical support.
Technical Data
in detail

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Technical data are subject to changes.
As the world marked leader in their field HEINKEL not only provides cutting edge technologies but also highly professional services. HEINKEL services can be contacted 24/7. HEINKEL Services provides immediate technical support by highly experienced experts. Surely HEINKEL will find a solution for any mechanical, electrical control or process questions.

Heinkel's world wide distributed network enables a reliability and capacity optimisation of installed systems - everywhere; at any time.

HEINKEL Services provides:
- Technical Support
- Online-Support
- Installation and Commissioning
- Preventative Maintenance
- Maintenance contracts
- Spare part logistics
- Rebuilds Upgrades
- Consulting
- Training

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