



RotowasherTM

Precision parts cleaning system

The RotowasherTM utilises a revolutionary rotating cleaning basket and benign carbon dioxide as solvent. This environmentally friendly solution achieves highest purity in precision parts cleaning. All parts are made of stainless steel. Compact design.

General

The Supercritical Fluid (SCF) Rotowasher™ precision parts cleaning system is suited for parts requiring high purity. The process uses environmentally benign CO₂ as the solvent compared to traditional processes that tend to use chlorinated or flammable solvents. The revolutionary rotation system allows even sintered pieces to be treated efficiently. Rotating baskets can be filled with any type of parts up to 100 mm in diameter. The unit is built in a compact skid mounted frame on wheels which can easily be connected to the electrical network, air supply and carbon dioxide storage. The size of the unit (2600 x 800 x 2000 mm) and weight 1400 kg, make installation easy and flexible. The organic contaminants removed are separated and collected and can potentially be reused.

Process

The cleaning process is based on dissolving organic contaminants (oils, waxes, etc.) in supercritical carbon dioxide (scCO₂) at elevated temperature and pressure. The CO₂ is initially pressurised and then heated to the desired conditions before being fed to the washing chamber. The rotating basket enables enhanced mass transfer thus maximising the cleaning result. After dissolving the organic impurities the CO₂ passes through a pressure release valve. The pressure of the "loaded" CO₂ is reduced to 50-70 bar and any liquid CO₂ is gasified in the evaporator/separator. The oil contaminants are collected in the bottom of the separator from where they are removed. An activated carbon filter is used to eliminate any liquid contaminants from circulating in the system. The gaseous CO₂ is then liquefied in the condenser and drops into the storage tank ready to be reused.

Process Items

Treatment Chamber

The unit has a washing chamber with a rotating basket of 12 L effective volume. The rotation speed can be adjusted up to 900 rpm. The washing chamber has a lid with easy to operate open-close function. Other sizes of washing chambers are available on request.

CO₂ Unit

The CO₂-loop consists of the main equipment as per the figure to the right. The main process parameters, temperature, pressure and washing time are controlled and can be adjusted independently for any process requirements or to tune the solvating performance of the carbon dioxide.

Instrumentation

The process is fully automated which makes operation very easy. The interface between the operator and the built-in control system consists of buttons for the main functions such as starting and stopping the washing sequence and there is a touch-screen for more detailed interaction with the control system. The progress of the washing cycle and the remaining washing time can be monitored on the screen as well.

Installation

All parts are assembled in a compact frame, complete with all piping, instrumentation and electrical wiring. The frame is covered with plate elements and all controls and gauges are located on the front panel.

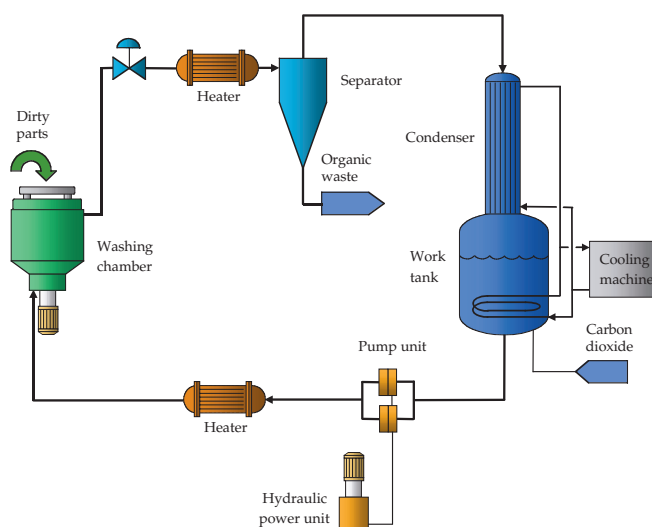
Process parameters

These values are indicative representing an average process. However, other values can be obtained depending on the application.

Min. cycle time	30 min
Effective volume	12 litres
Max. rotation speed	900 rpm

Requirements

Average power demand	6 kW
Electrical	3 phase, 400 V
Compressed air	6-7 bar; < 0.05 Nm ³ /h
CO ₂ consumption	1.5 - 4.5 kg/batch



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