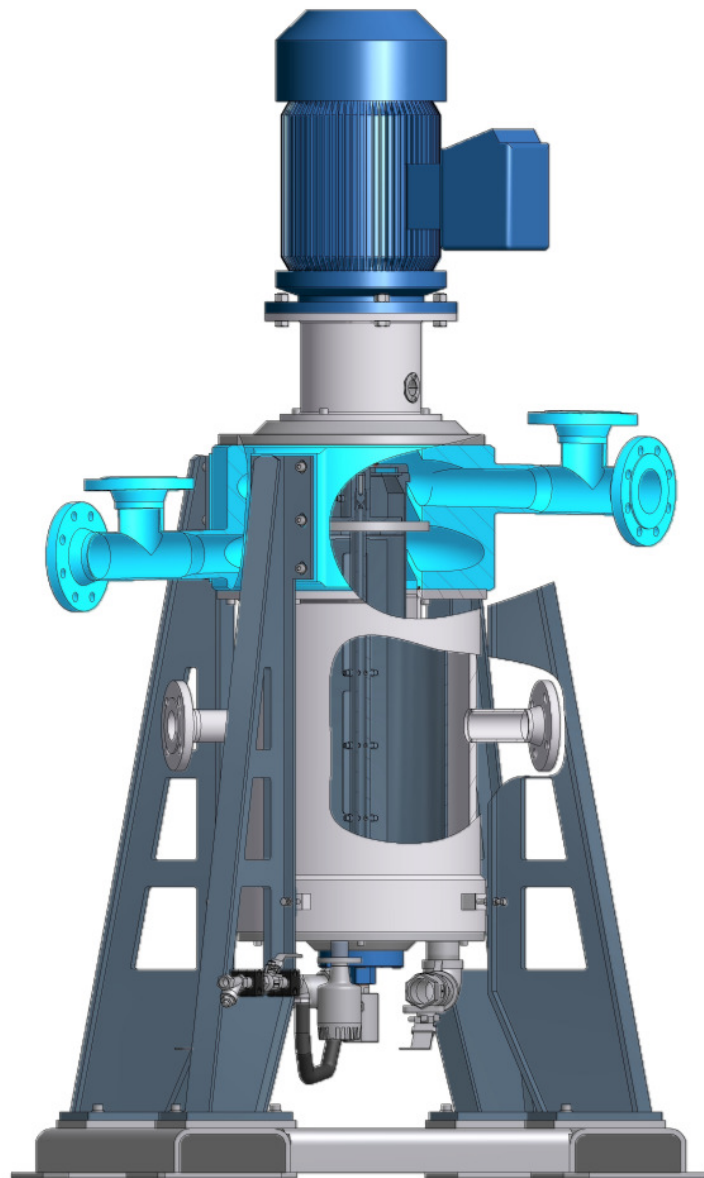


# EXTRACTION – WASHING - SEPARATION



**liquid – liquid solutions for continuous processes**



**Centrifuges at the centre of perfect processes**



# PRINCIPLE OF OPERATION

The annular centrifugal contactor operates as both separator and contactor which makes it a valuable tool in different applications. Its unique design provides mixing and separation in a single, compact unit. Figure 1. shows a cutaway view of the centrifuge housing and rotor and details the significant design features including the liquid flow path.

Two immiscible liquids of different densities are fed to the separate inlets and are rapidly mixed in the annular space between the spinning rotor and stationary housing. The liquids enter the central opening of the rotor bottom, the heavy phase is accelerated toward the wall, the light phase builds a layer on top of the heavy phase. The interface will be positioned half way between the lighter phase outlet and the heavier phase underflow at the top of the separating zone by an adjustable heavy phase weir.

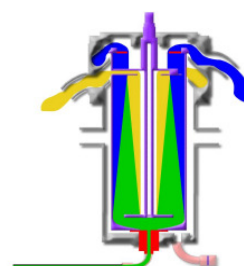
## Operation modes:

### Separation DF (direct feed):

Direct feed minimises the shear forces to the mixed fluid stream to enable an efficient separation.

The mixed fluid will be fed via the bottom inlet direct into the separation area inside the rotor.

Separation occurs continuously.



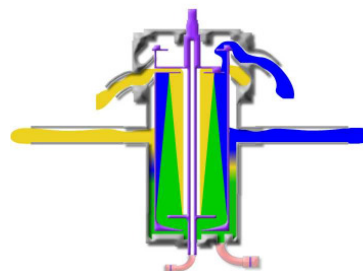
### Contactor Extraction / washing:

The mixing will be performed in the annular mixing zone between the spinning rotor and the housing wall.

Equilibrium will be reached after seconds

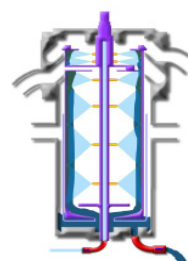
Special inserts optimise the mass transfer coefficient.

Inside the rotor separation occurs continuously.



### Clean in place CIP / Steam in place SIP:

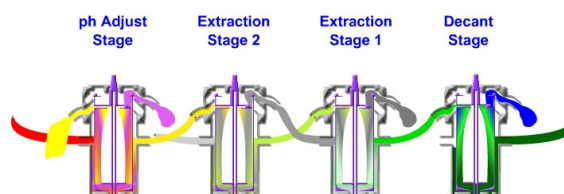
Cleaning of the centrifuge without taking the machine apart is provided by an integrated CIP / SIP system.



### Multi stage:

Each centrifuge represents one theoretical stage, processes requiring a multi stage counter current or cross current extraction are established with a series of centrifuges.

#### CINC Multi-Stage Process Simulation



easy to maintain

# PILOTING / SCALE – UP / START - UP

## **Piloting: (3 stage counter current extraction)**

The lab scale model gains the physical characteristics of the liquids. The collected data will be used to up scale to process size. The reached results will be guaranteed for the process.

The lab scale centrifuges are available as rental units.



## **Process: (5 stage counter current extraction)**

The start up and the installation is simple. The connection to a common header provides inertisation for the xp environment.



### **CINC centrifuges are available:**

- in different materials from stainless steel to Hastelloy.
- according to the ATEX 100 regulation
- polished for the cGMP / FDA environment..
- different sizes for flow rates from 0 – 30000 l/h.
- as Rental units (xp) for flow rates up to 4000 l/h.
- with heat- and cool- able housings

**Please contact us for more information's:**



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## Centrifuges at the centre of perfect processes