



# How to optimize fish processing with decanters

– Best practice webinar

September 2021

# Agenda

– How to optimize fish processing with decanters



- Introduction to Alfa Laval
- Design, configuration and working principle of decanters in the fish industry
  - Decanter basics
  - Streamlining decanter operations
  - Decanter cleaning procedures
- How to keep your decanter in its best shape
  - Decanter parts and services
  - Connected services
  - Upgrades – targeting fish-processing decanters
  - Service agreements
- Q&A

# A global company with a strong local presence



# We serve most industries



Biofuels  
Biotech and pharmaceutical  
Chemicals  
Crude oil refinery  
Engine and transport  
Fluid power  
Food and beverages  
HVAC  
Industrial fermentation  
Latex  
Machinery



Marine and diesel  
Metal working  
Mining and mineral processing  
Oil and gas  
Power  
Pulp and paper  
Refrigeration and air-conditioning  
Semiconductor systems  
Steel and coke oven gas  
Sugar  
Wastewater treatment

# Alfa Laval products for the food industry



High Speed Separators



Decanters



Hygienic Fluid Handling



Food Heat Transfer



Food Systems



# Design, configuration and working principle

- Decanters in the fish industry

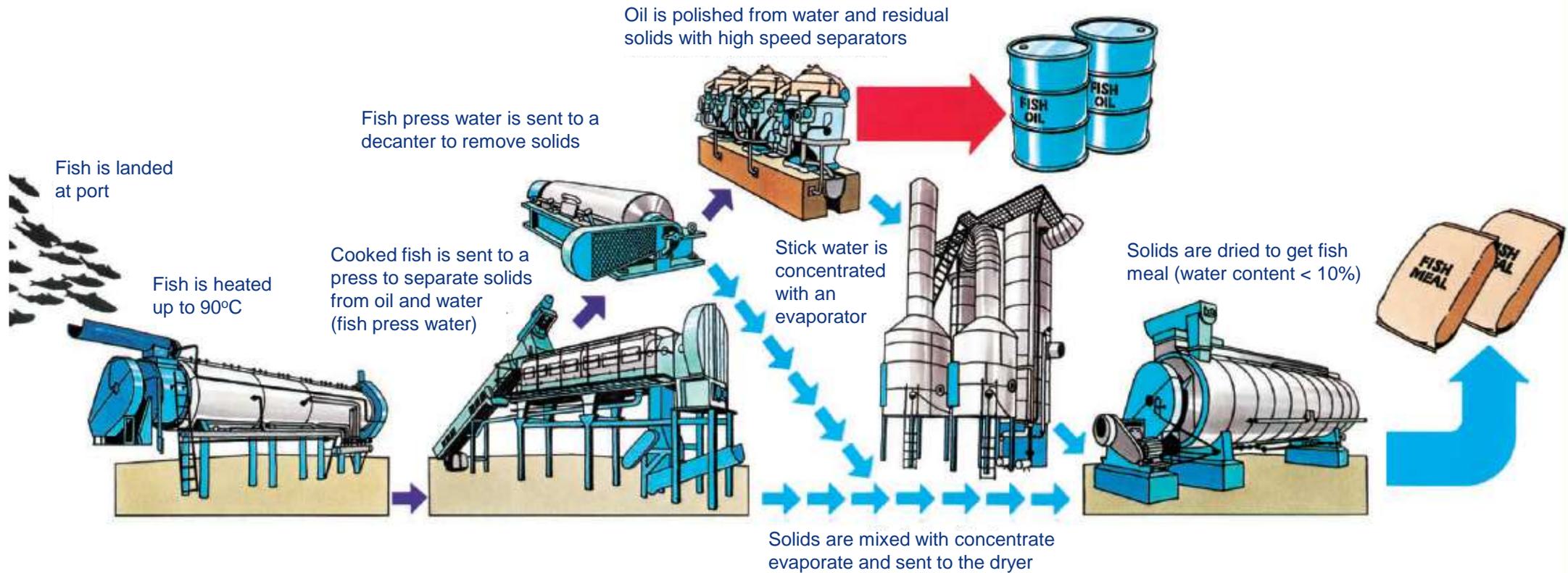
**Matteo Betti**

Global Sales, Food Industry  
Decanters

Alfa Laval Copenhagen

# Fish processing industry

## Fish meal production diagram



# Decanters for the fish industry

- Basic principles and functionality



© 2011 Alfa Laval

Static decanter

# Decaners for the fish industry

– Process challenges and decanter design

## Challenge



- High solids content, solids load fluctuations
- Fine solids
- Bones, and sand
- Food-grade execution

## Consequence



- High torque load
- Solids transportation issues
- Wear and tear
- Cleanability

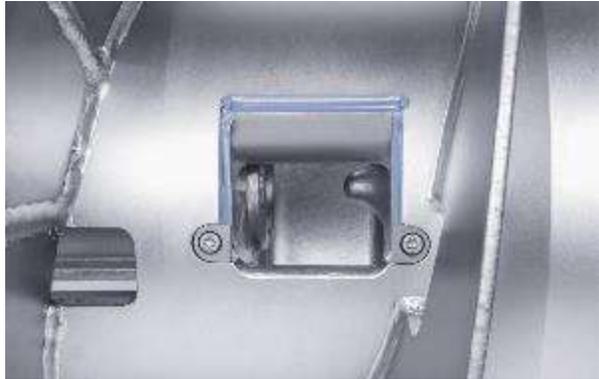
## Impact on design



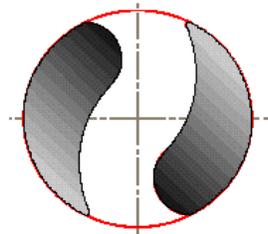
- Conveyor design and gearbox size
- Bowl geometry and design and transportation aids
- Hard surface protection
- Hygienic design

# Decanters for the fish industry

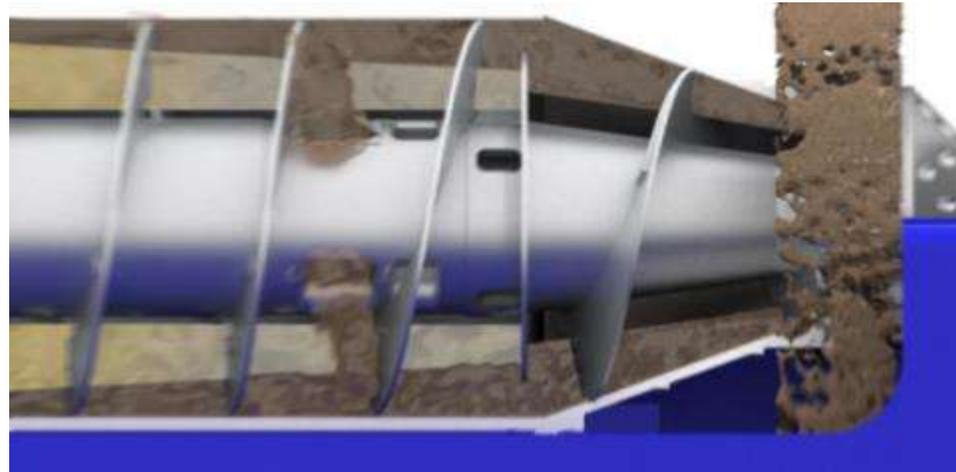
– Conveyor



- Conveyor with baffle disc
- Constant pitch (except for surimi)
- EU3 feed zone with TC wear liner
- TM42 (or tiles) wear protection or tiles protection on conical section

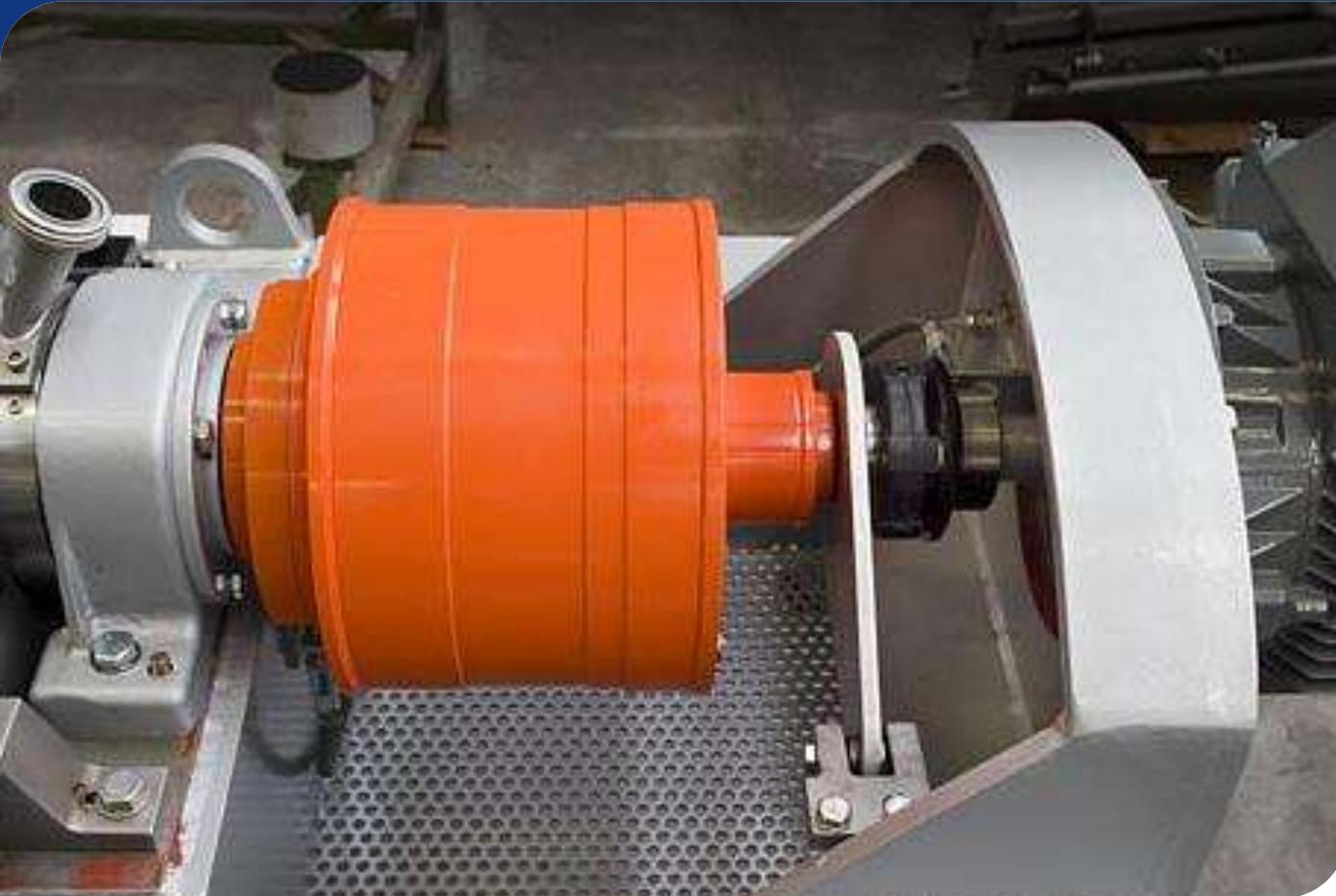


**Cross-section**  
of conveyor hub



# Decanters for the fish industry

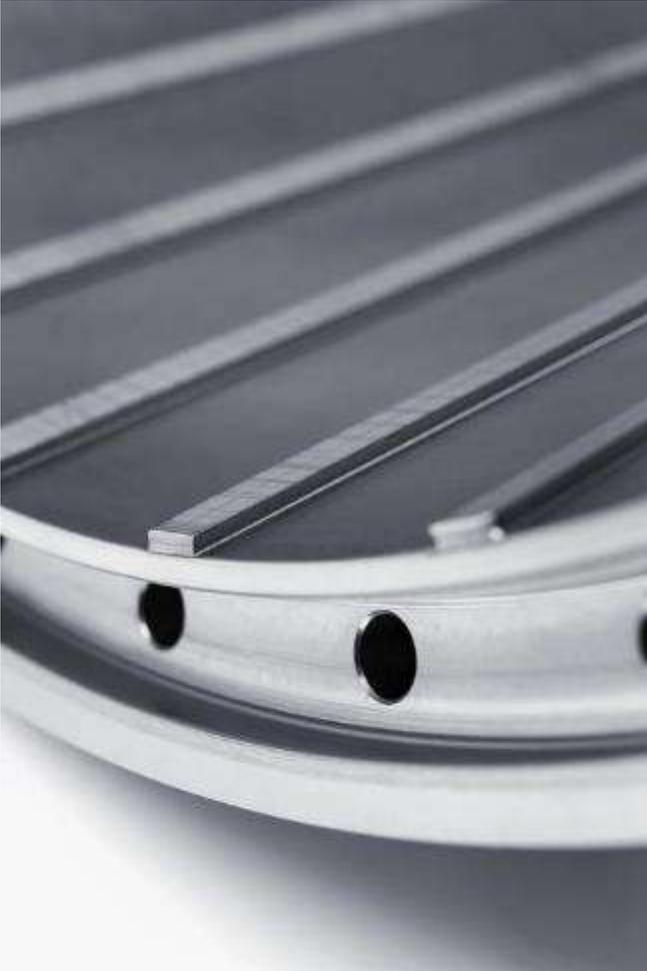
– Gearbox



- Direct drive gearbox: high force with minimum differential speed
- Gearbox size selected to work at 20–30% of the maximum torque load available to ensure durable operation

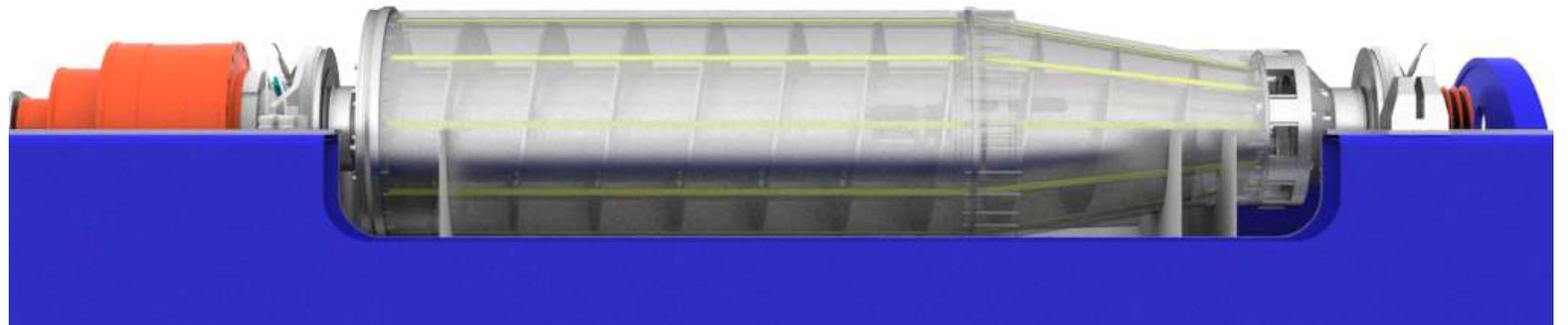
# Decaners for the fish industry

- Bowl and solids transportation aids



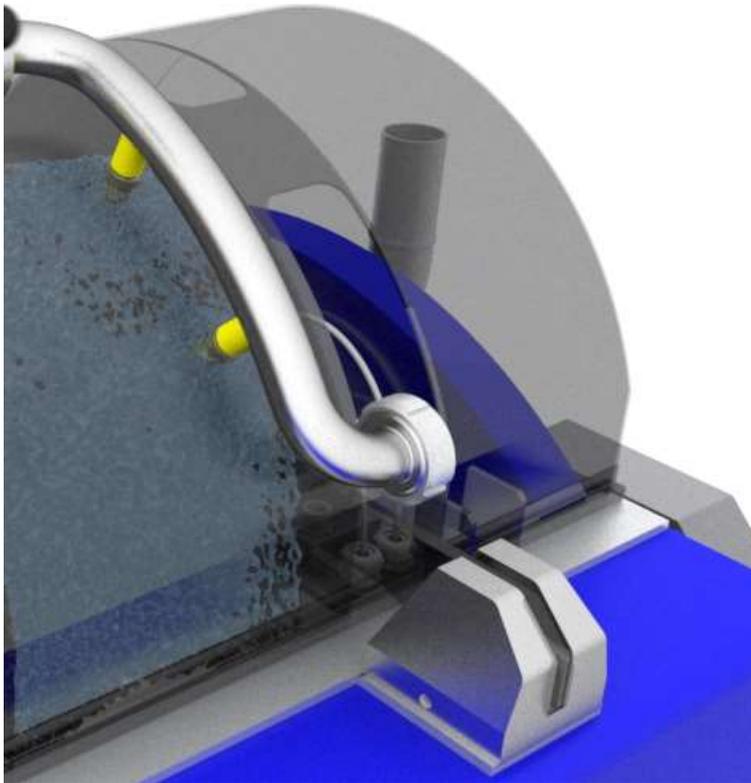
## SaniRibs®

- Seal welded ribs
- High hygiene standards
- High friction



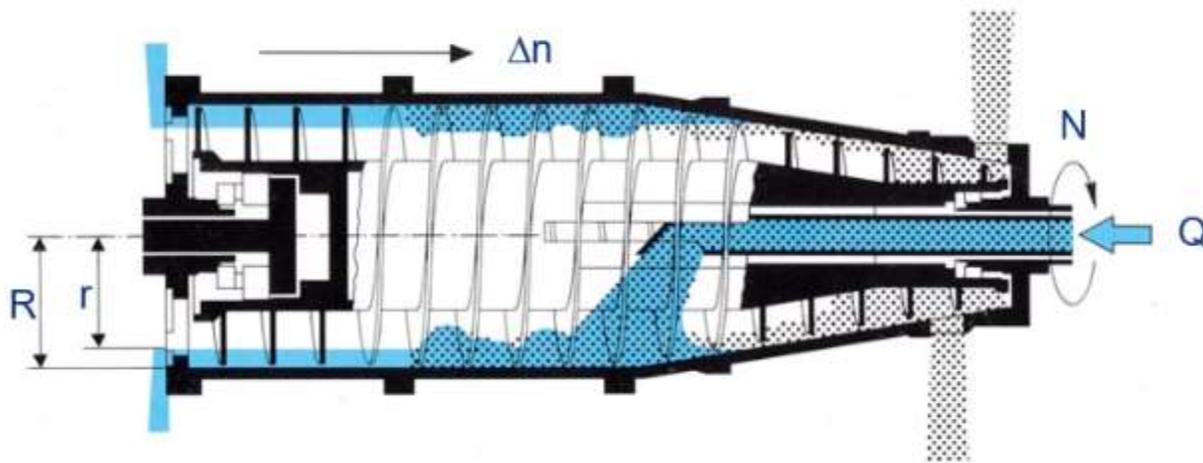
# Decaners for the fish industry

- Execution details – CIP bar and CIP nozzles



# Decanter optimization

– Basic parameters



- Feed flow ( $Q$ )
- Feed viscosity (temperature)
- Bowl speed ( $N = G$  force)
- Liquid outlet radius ( $R-r =$  pond depth)
- Differential speed ( $\Delta n$ )

# Decanter optimization



– Parameters and impact on process performances

## Parameter

- Feed Flow
- High Feed temperature
- High Bowl speed
- Low diff speed
- Smaller outlet radius

## Consequence

- Residential time
- Lower viscosity
- Higher G-force
- Higher torque load
- Deeper pond

## Positive impact

- Good separation
- Better separation
- Better clarification, more solids dryness
- Drier solids
- Cleaner liquids and better solids transportation

## Negative impact

- Bad feed acceleration
- Bad quality product if low temp process
- Higher wear and energy consumption
- Dirtier liquids
- More wet solids

# Cleaning procedures

– Definition



## Cleaning

- Flush – product displacement = end of production
- CIP – water and detergent based
- SIP – liquid sanitization

## Entire cleaning sequence described by alternating high speed and low speed

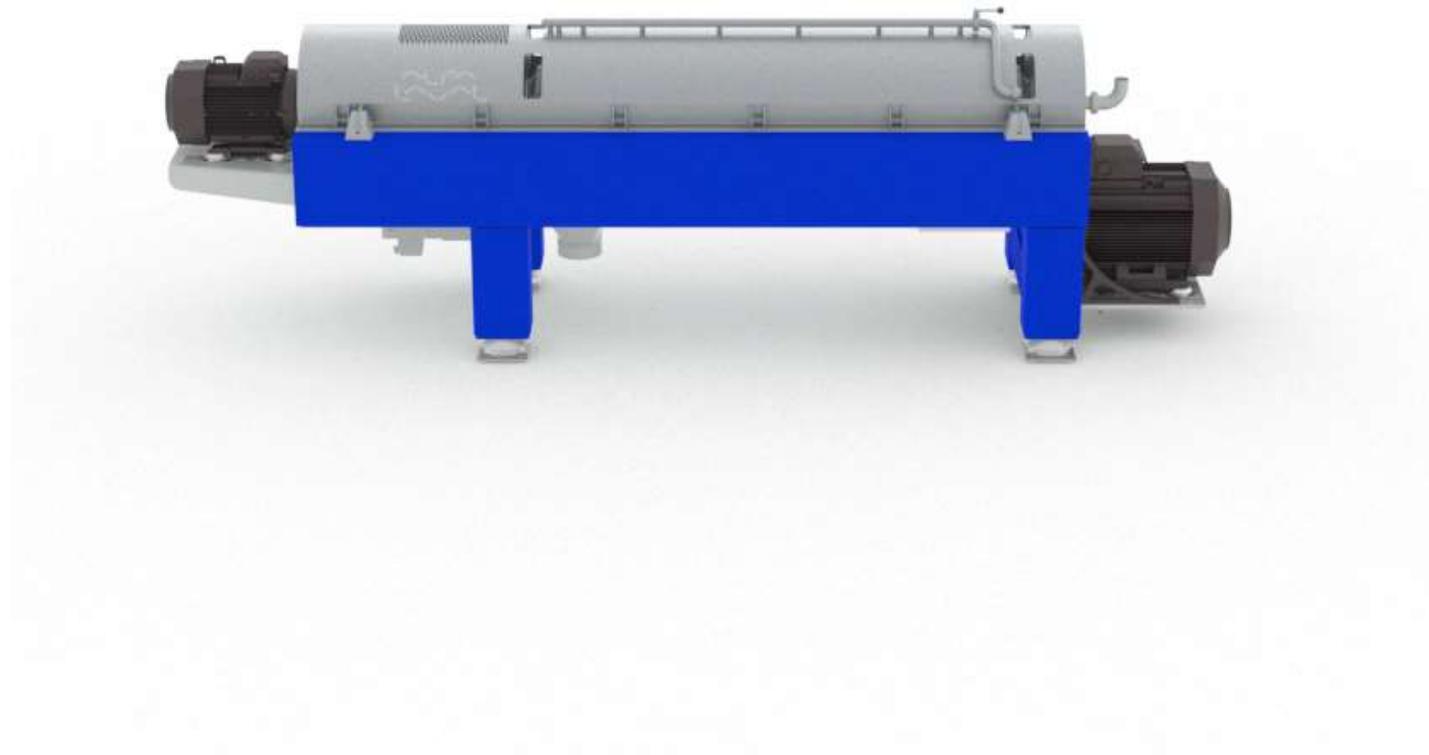
- HS – High speed = operating bowl speed
- RS – Reduced speed
- LS – Low speed tumbling

# CIP and flushing procedures

– Steps



1. Stop feed and start Flushing at full bowl speed

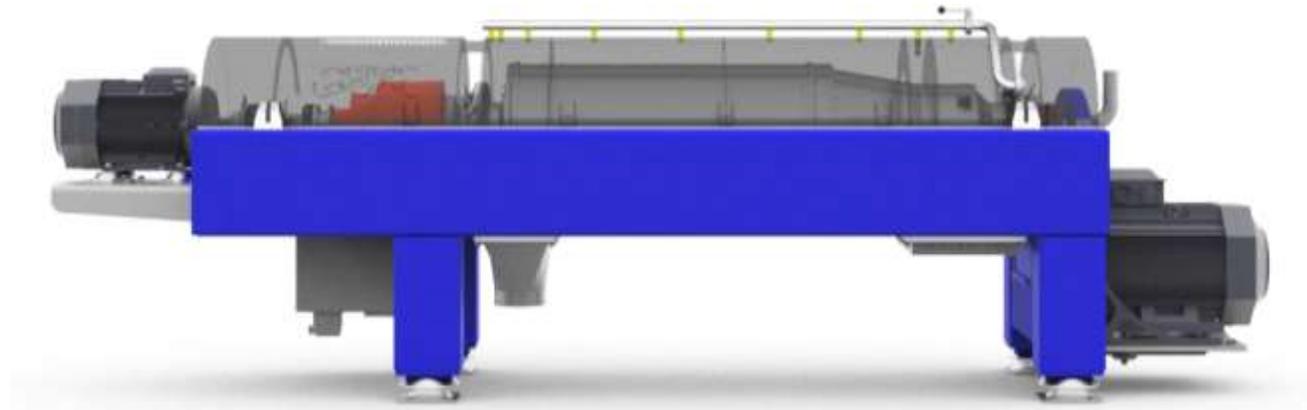


# CIP and flushing procedures

## – Steps



1. Stop feed and start Flushing at full bowl speed
2. External bowl Surface Flushing if CIP bar is present

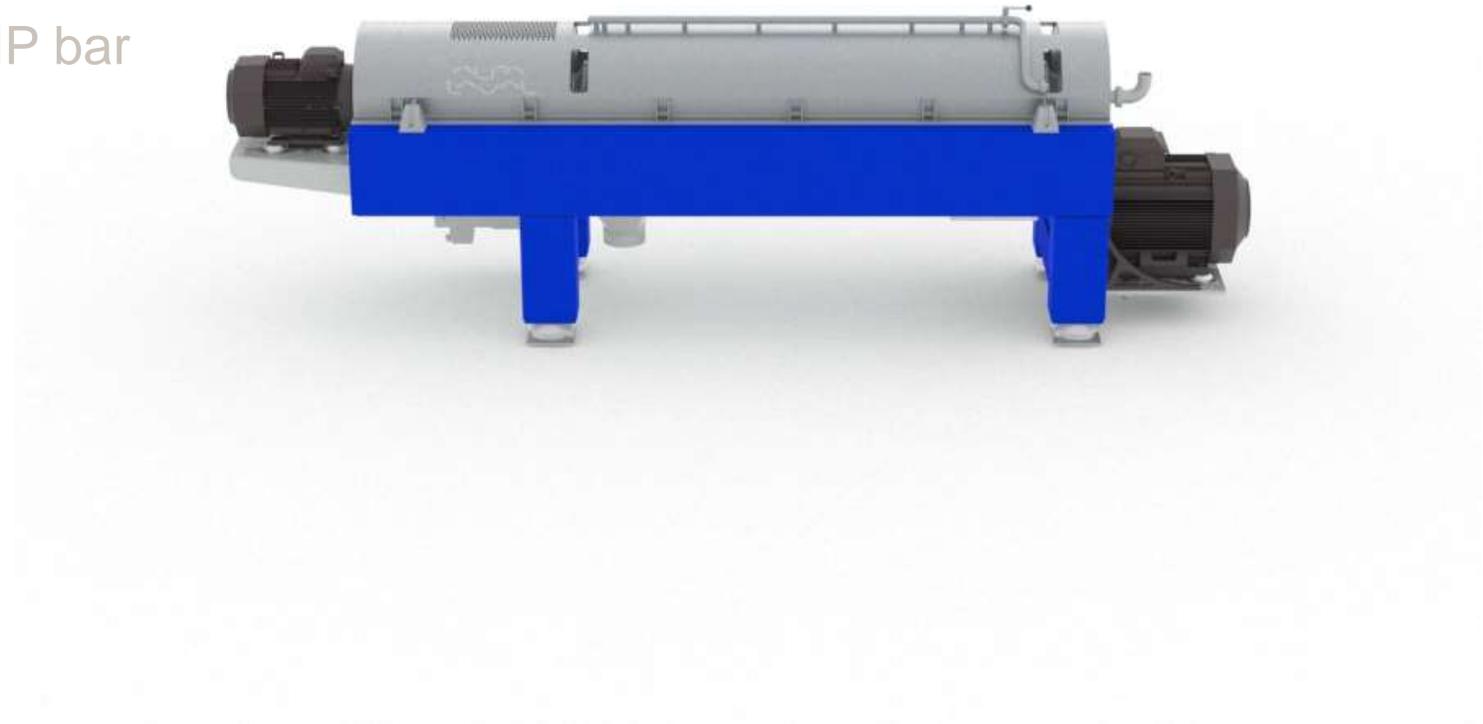


# CIP and flushing procedures

– Steps



1. Stop feed and start Flushing at full bowl speed;
2. External bowl Surface Flushing if CIP bar is present
3. **Reduced speed Flushing**



# CIP and flushing procedures

## – Steps



1. extending number of cycles and time until water is clean, always at high temperature  $>85^{\circ}\text{C}$
2. External bowl Surface Flushing if CIP bar is present
3. Reduced speed flushing
4. Low speed tumbling





# How to keep your decanter in optimum condition

- Service and maintenance of decanters in the fish industry

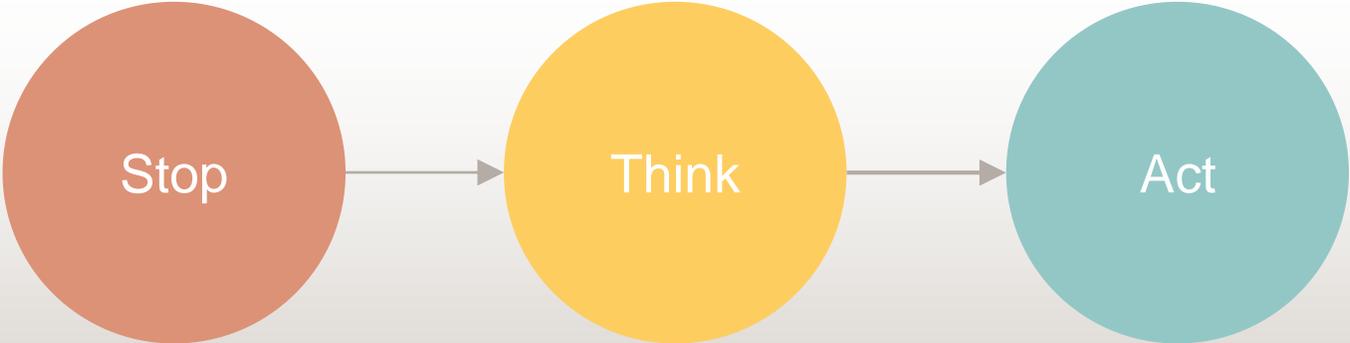
**Kenn Honoré Jepsen**

Service product portfolio responsible  
BU decanter – central Service

Alfa Laval Copenhagen A/S

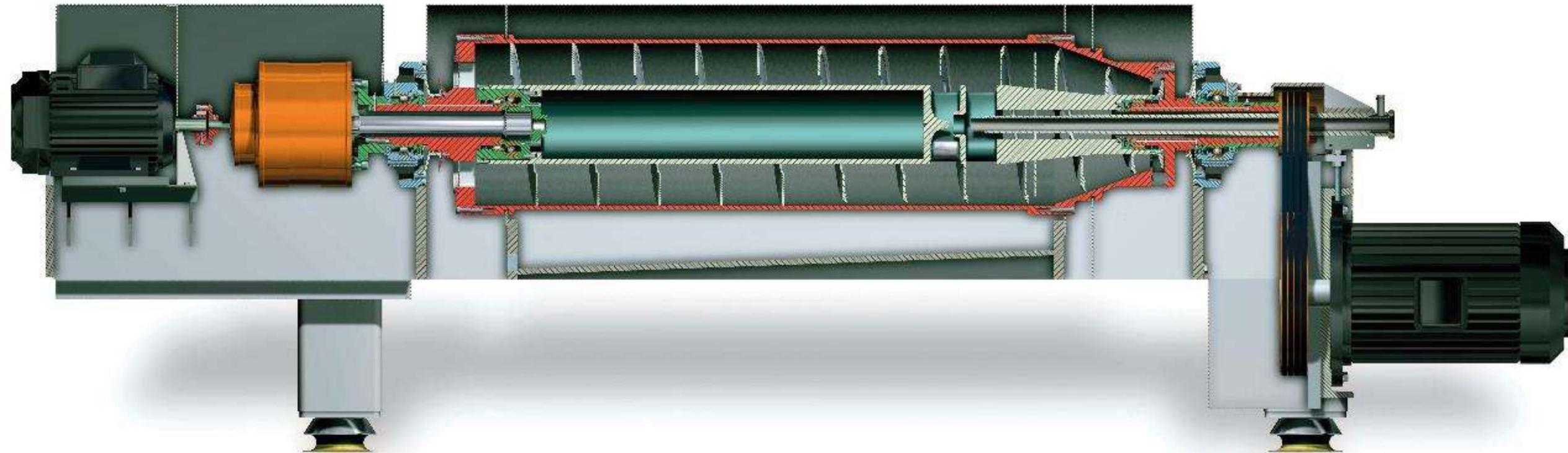
# Safety F1rst

S E R V I C E O P E R A T I O N S



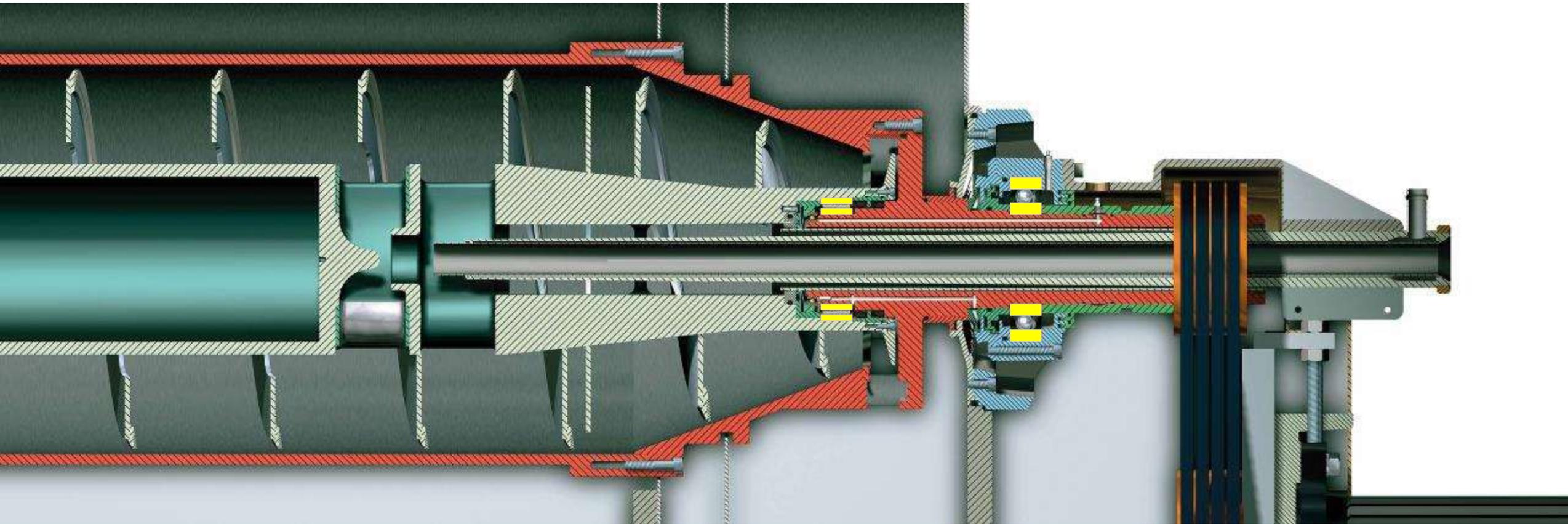
# How does a decanter work?

– Significant parts for service



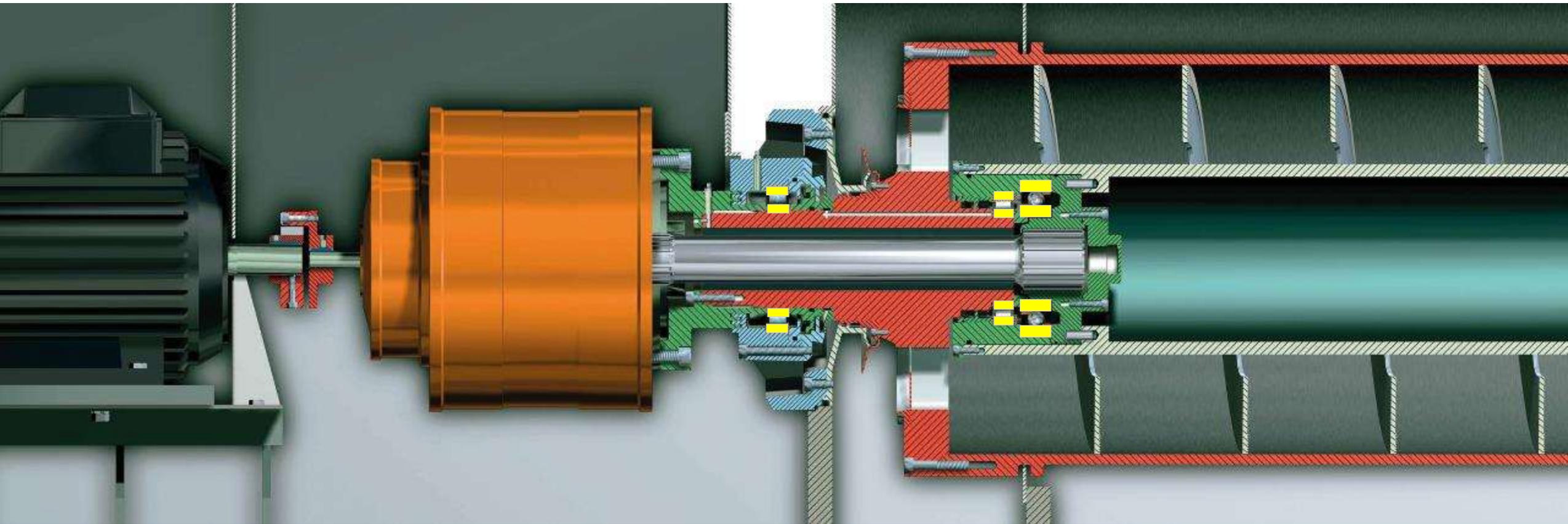
# How does a decanter work?

– Significant parts for service



# How does a decanter work?

– Significant parts for service



# Daily checklists

– Best practice



## Mechanical

- ✓ Cleanliness: Look for oil leaks, grease spots, liquid spills, etc.
- ✓ Check bearing and general machine noise

## Operational

- ✓ Check machine vibration and temperature
- ✓ Check main motor current and temperature
- ✓ Check feed flow rate, conveyor torque and differential speed

## When stopping, flush with water until clean

- ✓ Do not leave corrosive liquids or dry matter in the decanter

# Weekly/monthly checklists

– Best practices



## Weekly/monthly checklists

- ✓ Check covers for solids build-up
- ✓ Check feed tube for wear or damage
- ✓ Greasing and lubrication:
  - Ensure that the bearings are properly greased
  - Check gearbox oil level  
*Change the oil at the recommended interval*
- ✓ **Use only approved brands** of grease and oil and make sure they meet the recommended shelf life
- ✓ Check belt tension **every six months**



# Preventive maintenance

– Alfa Laval Service Kits



## Service made easy by kits

- Preselected parts
- Hassle free

## Major service kit

Based on running hours and Alfa Laval's expertise of different applications

## Intermediate service kit

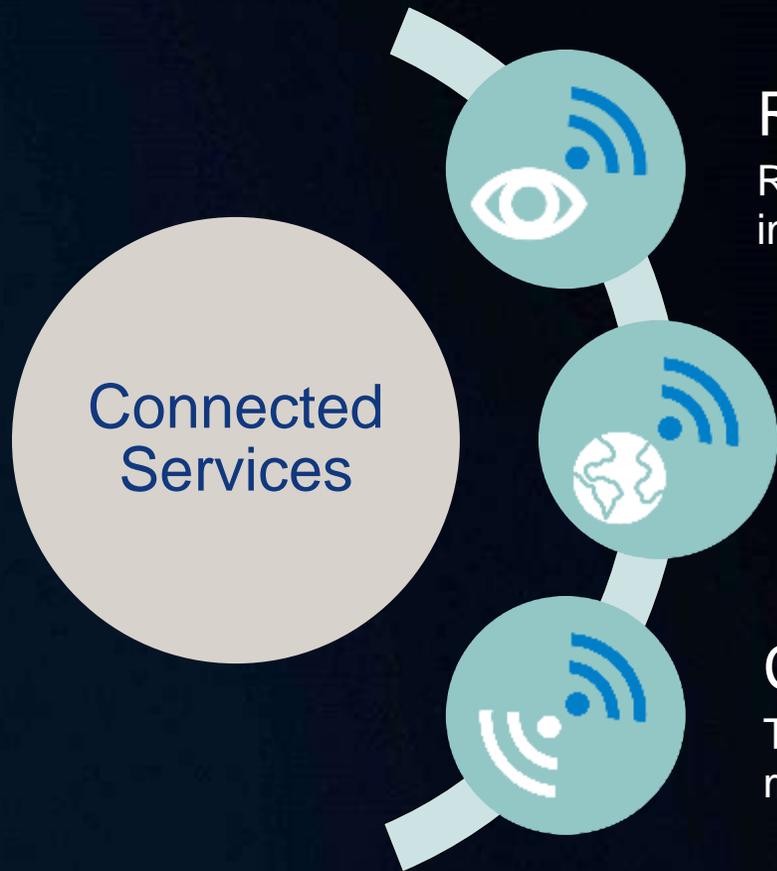
For high-temperature applications requiring intensive Cleaning-in-Place (CIP)

## Other wear parts

Feed pipe, feed zone, conveyor flights, bowl and gear box.

# Next-generation services

– Remote support and predictive maintenance



## Remote monitoring

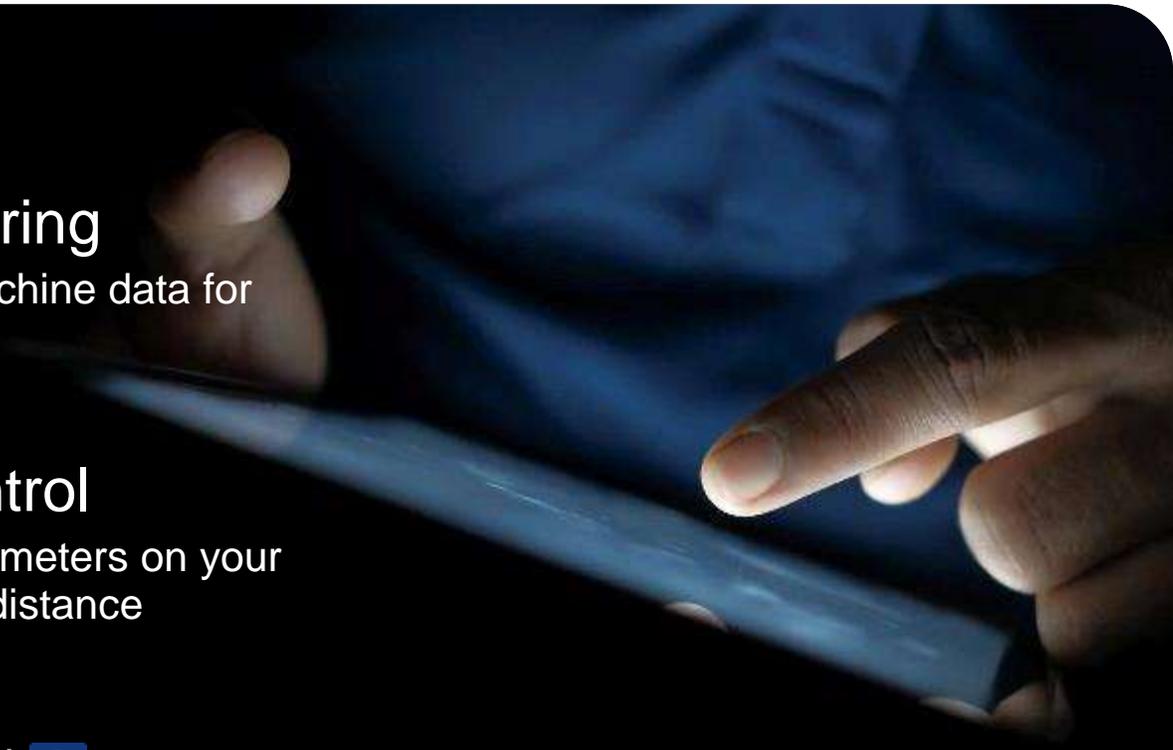
Remote access to machine data for immediate support

## Remote control

Change key parameters on your decanter from a distance

## ConditionAlert™

Taking a step towards predictive maintenance



# ConditionAlert™ is predictive maintenance

– Next-generation services



- Alfa Laval ConditionAlert™ *continuously* monitors main and conveyor bearings
- Valuable service recommendation, in advance, so you can optimize uptime and reduce costs
- Insights into the decanter's condition
- Reduce risk of unplanned stops



Alfa Laval  
ConditionAlert™  
for decanters



## Remote monitoring

- Enables you to mirror the control panel of your equipment from a distance
- Gives experts access to data from a remote location and, if needed, enables enhanced troubleshooting

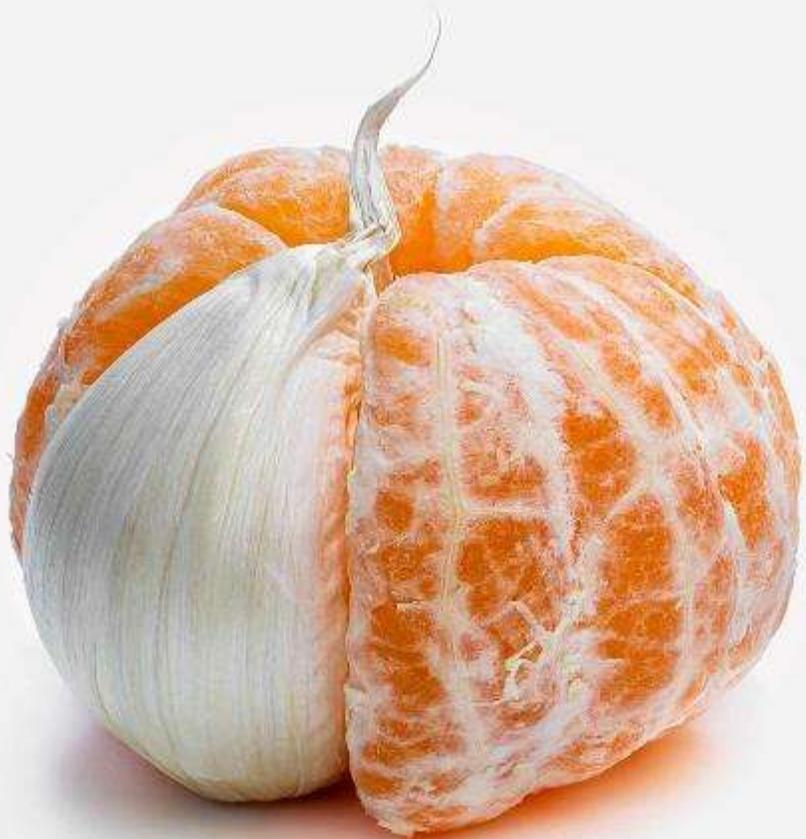
## Remote guidance

- Close collaboration using a mobile device that ensures good cooperation between the onsite staff and one or more remote experts



# Spare parts and critical spares

– Use genuine spare parts



## The importance of genuine spare parts?

- Like-for-like replacement of parts in a decanter ensures operating condition as per design
- When using genuine spare parts, you are guaranteed performance and reliability
- Maintain a stock of essential spare parts such as grease, oil, and intermediate and major service kits

**Don't be fooled! Just because it fits doesn't mean it works.**

# Upgrades

– Change is constant

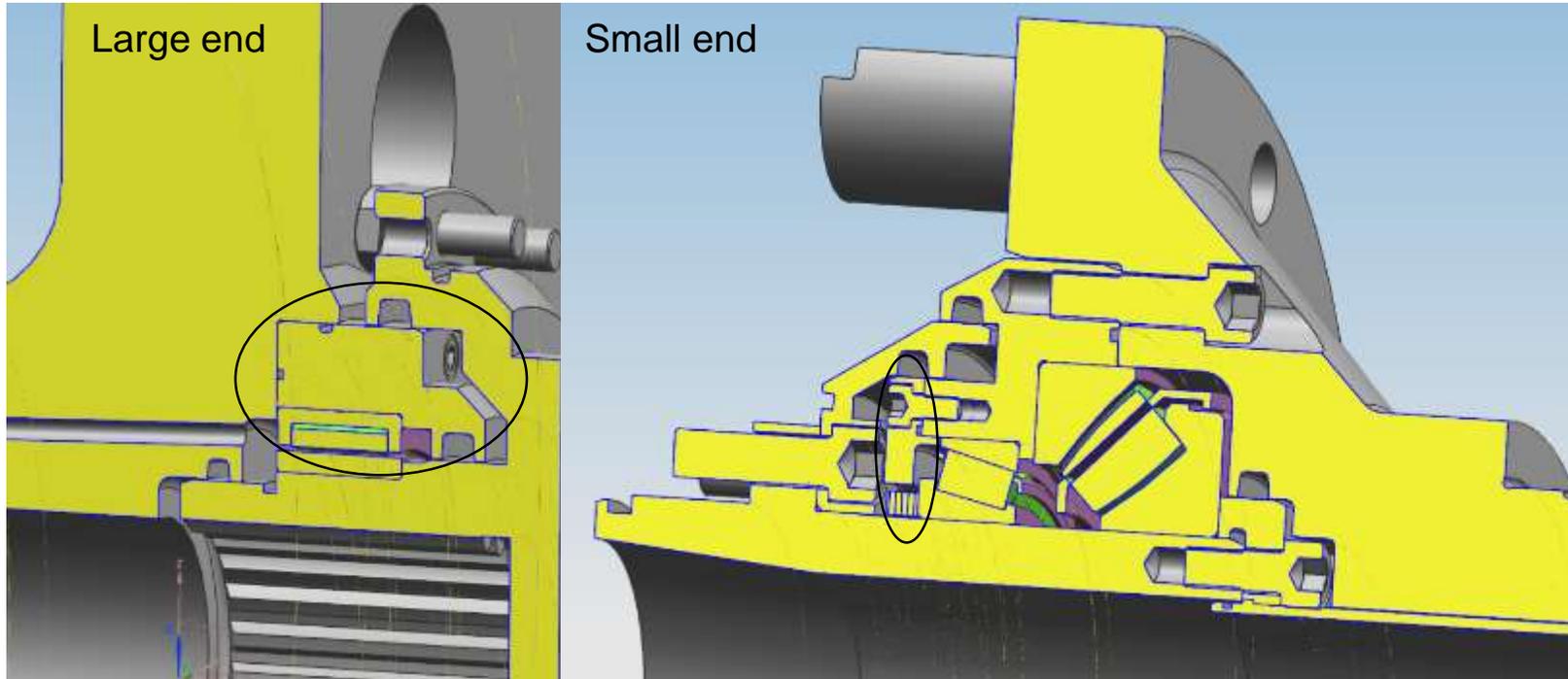


## Decanter upgrading is inevitable

- Continuous improvement of functionality and design
  
- Customer value of upgrading
  - Efficiency improvements
  - A sustainable approach
  - Decreasing operational costs

# Upgrades – fish-processing decaners

- Grease retainer



**Grease retainer for conveyor bearings.**

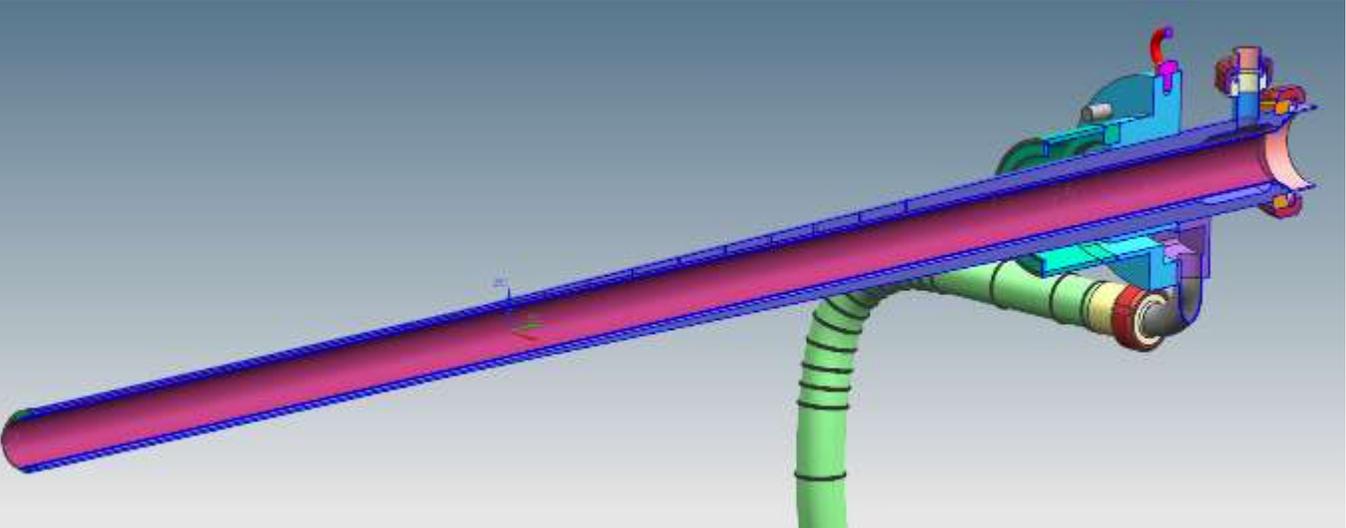
- High temperature
- Extended greasing intervals
- Lower cost of maintenance

# Upgrades – fish-processing decanters

- CIP Feed Tube

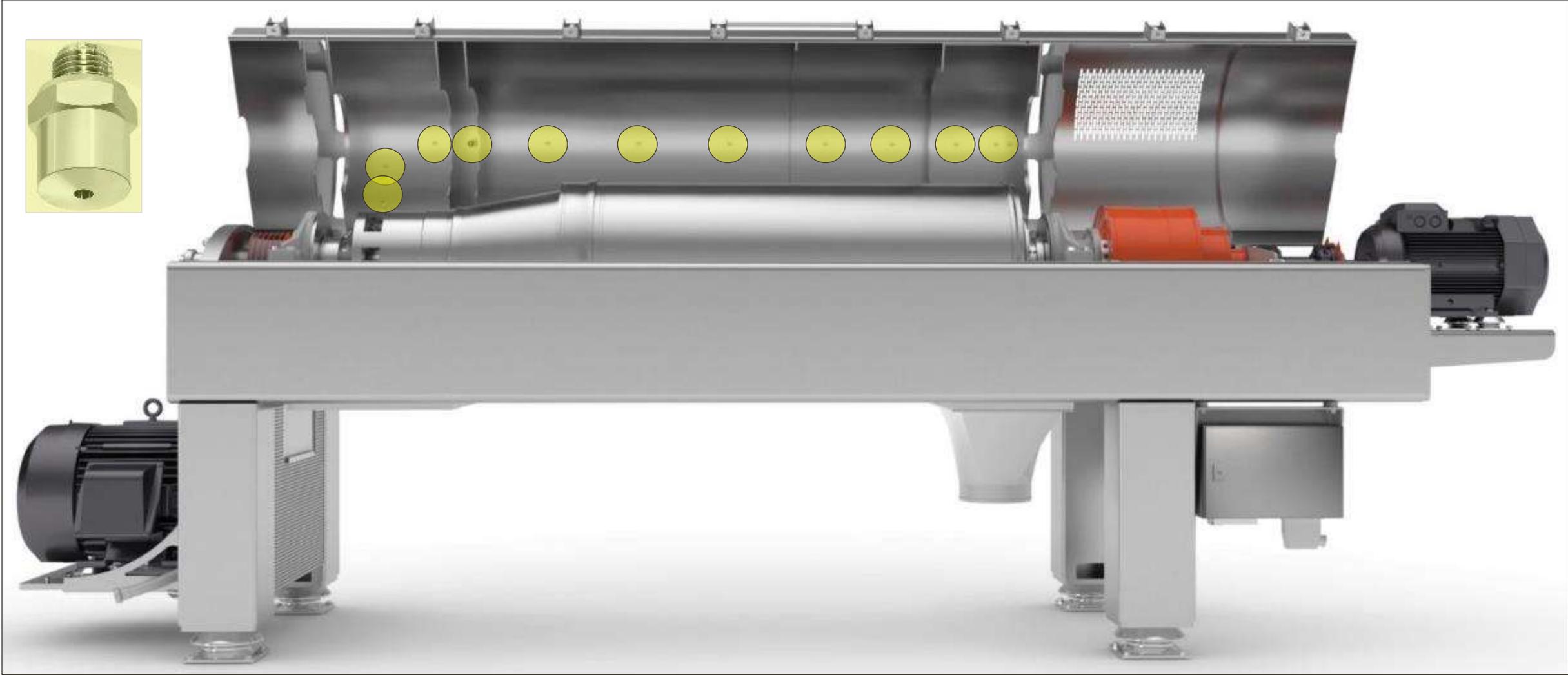


## Efficient and safe cleaning of the Decanter



# Upgrades – fish-processing decanters

– CIP bar and CIP nozzles



# Upgrades – fish-processing decanters

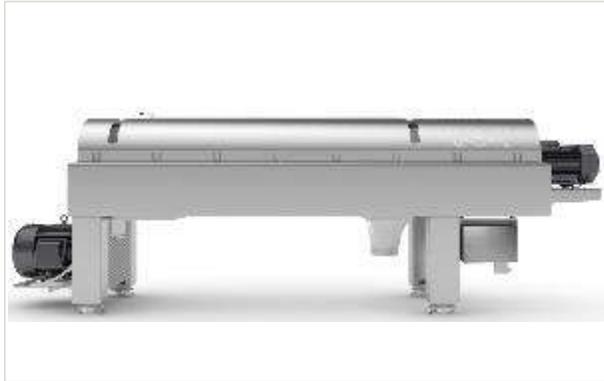
– CIP bar and CIP nozzles



- Adjustment of nozzles
- Reduce consumption of water and cleaning agents
- Faster cleaning

# Upgrades – fish-processing decanters

– Stainless steel frame

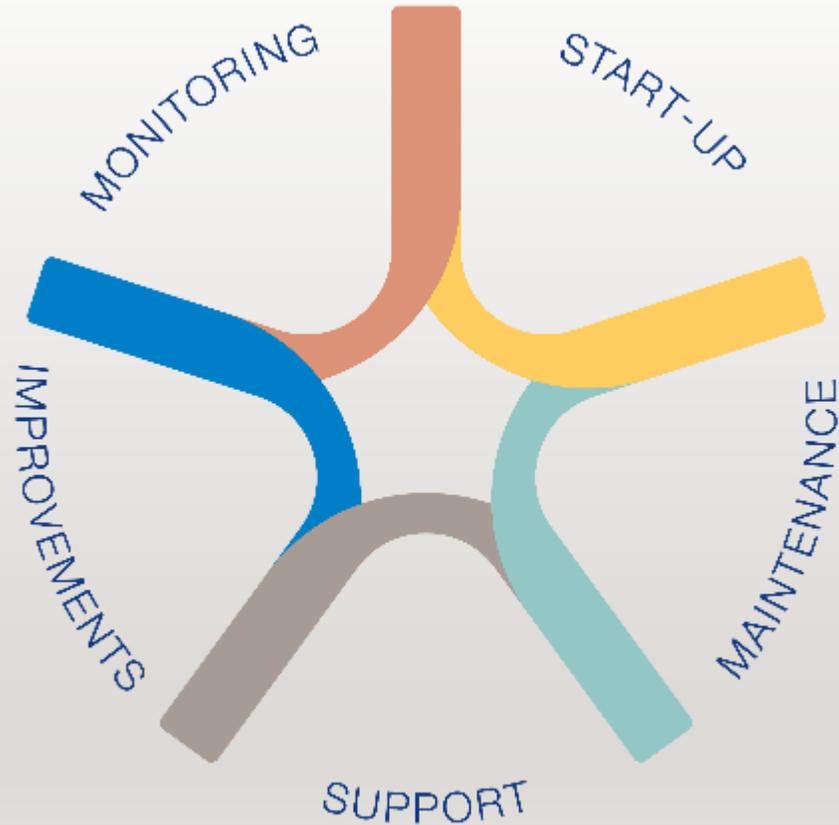


## Stainless steel frames

- Prevent rust inside the hollow beam profile and on exterior surfaces
- Withstand harsh environments
- Overall more hygienic appearance
- No need for refurbishment

# Service Agreements

– Better control of your maintenance and operation costs



- Predictable cost
- Planning
- Priority
  
- Reduced risks
- Maximized production uptime
- Prolonged equipment lifetime



# Any further questions

## Please feel free to contact:

**Matteo Betti**, Global Sales food decanters

Tel: +39 3489004989

Email: [matteo.betti@alfalaval.com](mailto:matteo.betti@alfalaval.com)

**Kenn Honoré Jepsen**, Service product portfolio, decanters

Tel: +45 303 309 64

Email: [kennhonore.jepsen@alfalaval.com](mailto:kennhonore.jepsen@alfalaval.com)

