

Not just spin. Revolution!



9586 58th Place Kenosha, WI 53144

Headquarter Facilities

www.centrisys.us 



3 Corporate Buildings *Over 150,000 ft²!*



HEADQUARTERS: 9586 58th Place ■ Kenosha, WI 53144 ■ P (877) 339-5496 ■ info@centrisys.us

WESTERN DIVISION: 825 Performance Drive ■ Stockton, CA 95206 ■ P (877) 339-5496 ■ info@centrisys.us

FOCUSED RESOURCES + PLANNING MAXIMIZES CAPACITY POTENTIAL



WITH NO STRUCTURAL
MODIFICATIONS TO
THE KENOSHA
FACILITIES --
PRODUCTION
CAPACITY ALLOWS
FOR \$75M+



CITY OF FRESNO CA



OVER 1500
MACHINES
INSTALLED
WORLDWIDE

MUNICIPAL + INDUSTRIAL APPLICATIONS



CS18-3 Drilling Mud Machines



City of Chen Yuen China
(14) CS26-4



(2) CS30-4T Austin Texas



CS21-4 Soya Milk Production



CS21-4HC City of Patterson CA

Not just spin. Revolution!

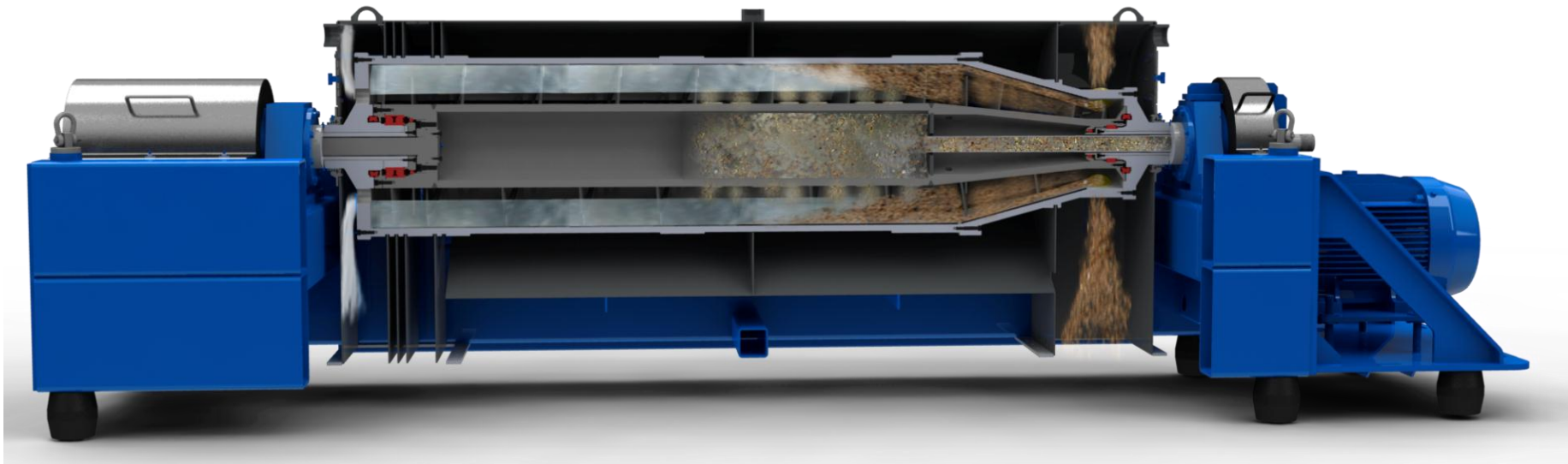


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www.centrisys.us

High Performance Decanter Centrifuges



 made in
the USA

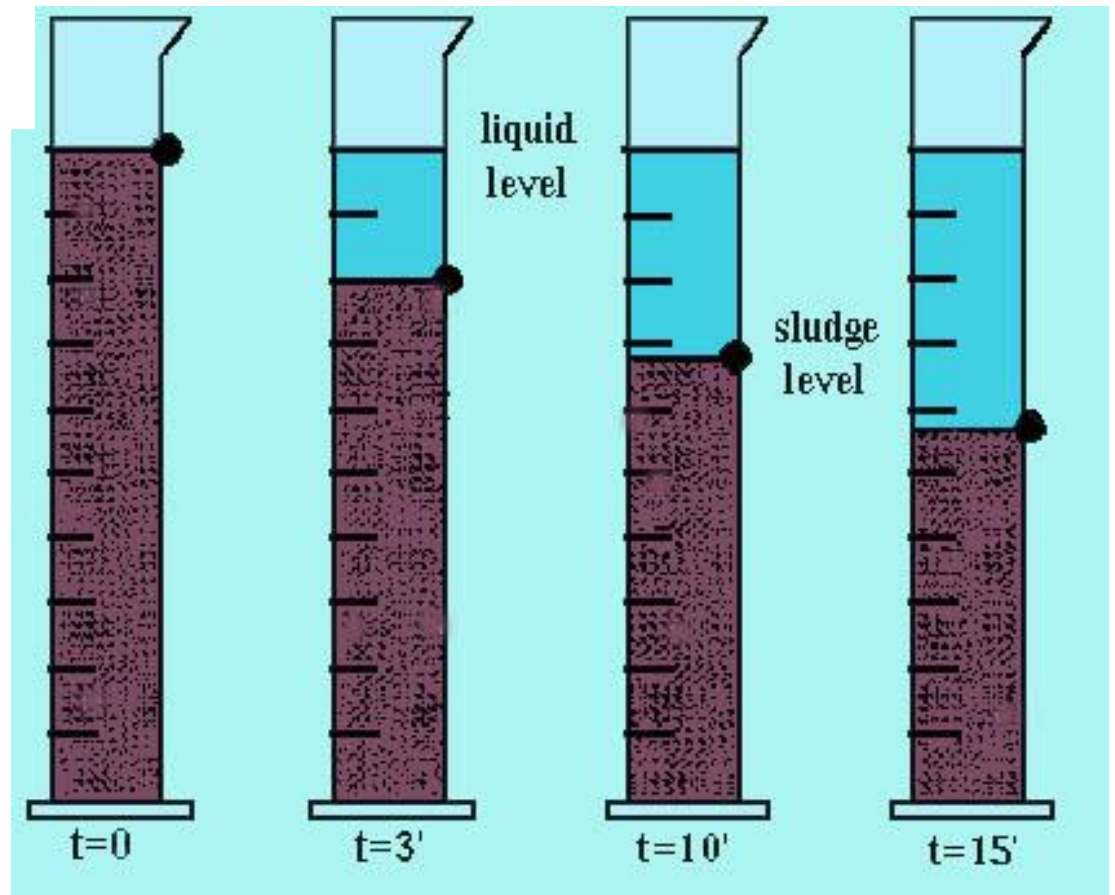
Sedimentation Theory

Basic Centrifuge Function

Sedimentation Theory



Sedimentation is influenced by



- ✓ Particle diameter
- ✓ Density difference between solids and liquids
- ✓ Centrifugal force - "G" Force
- ✓ Viscosity of liquid

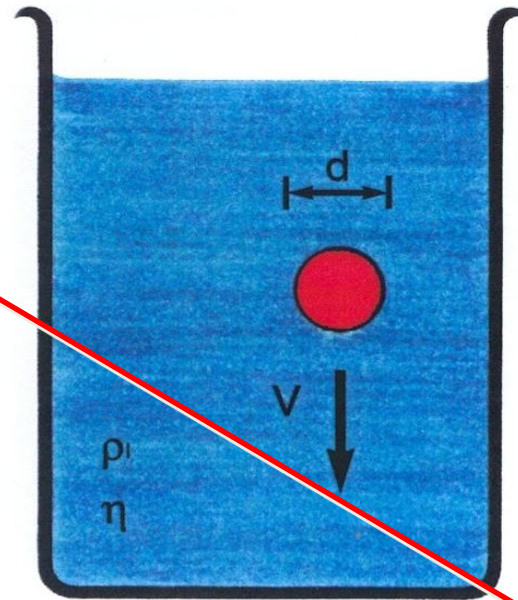
Sedimentation Theory

Sedimentation Theory

$G=3000$

Sedimentation is influenced by

- ✓ Particle diameter
- ✓ Density difference between solids and liquids
- ✓ Centrifugal force - "G" Force
- ✓ Viscosity of liquid



ρ_p : Particle density

ρ_l : Liquid density

d : Particle diameter

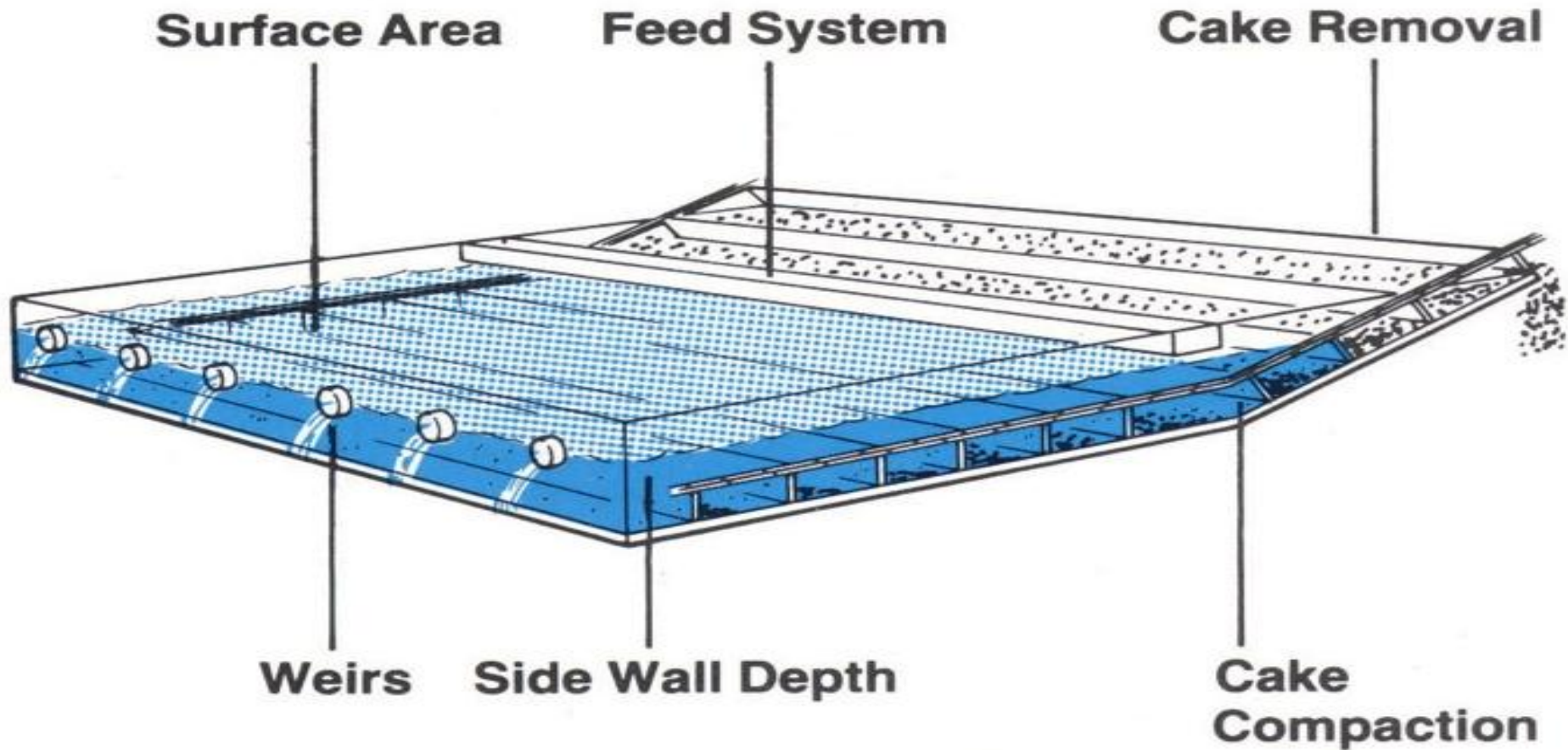
η : Liquid viscosity

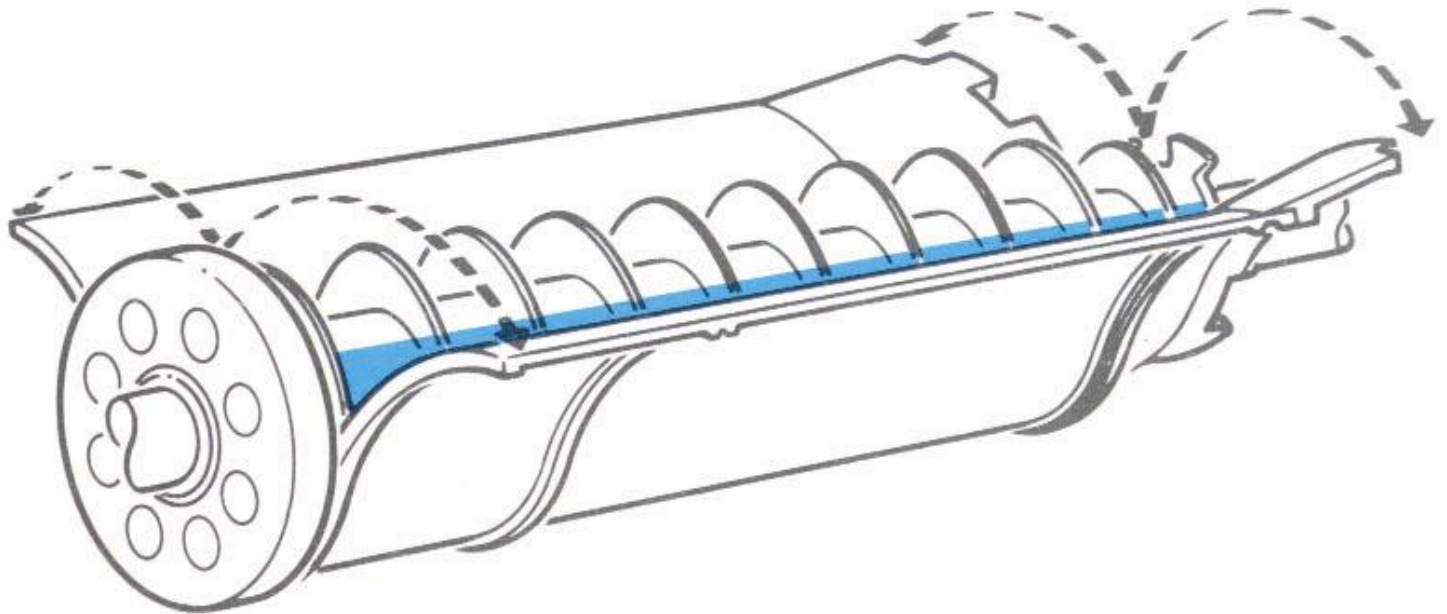
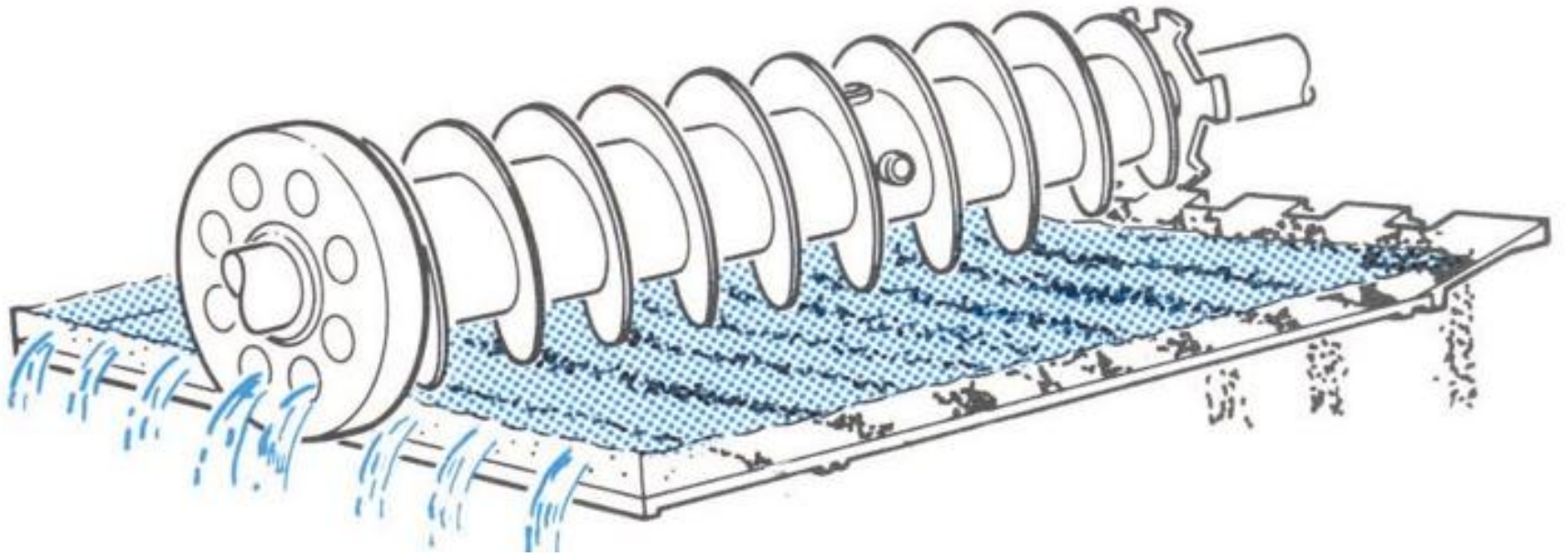
Sedimentation velocity:

$$V = \frac{d^2 (\rho_p - \rho_l)}{18 \eta} \times G \text{ m/s}$$

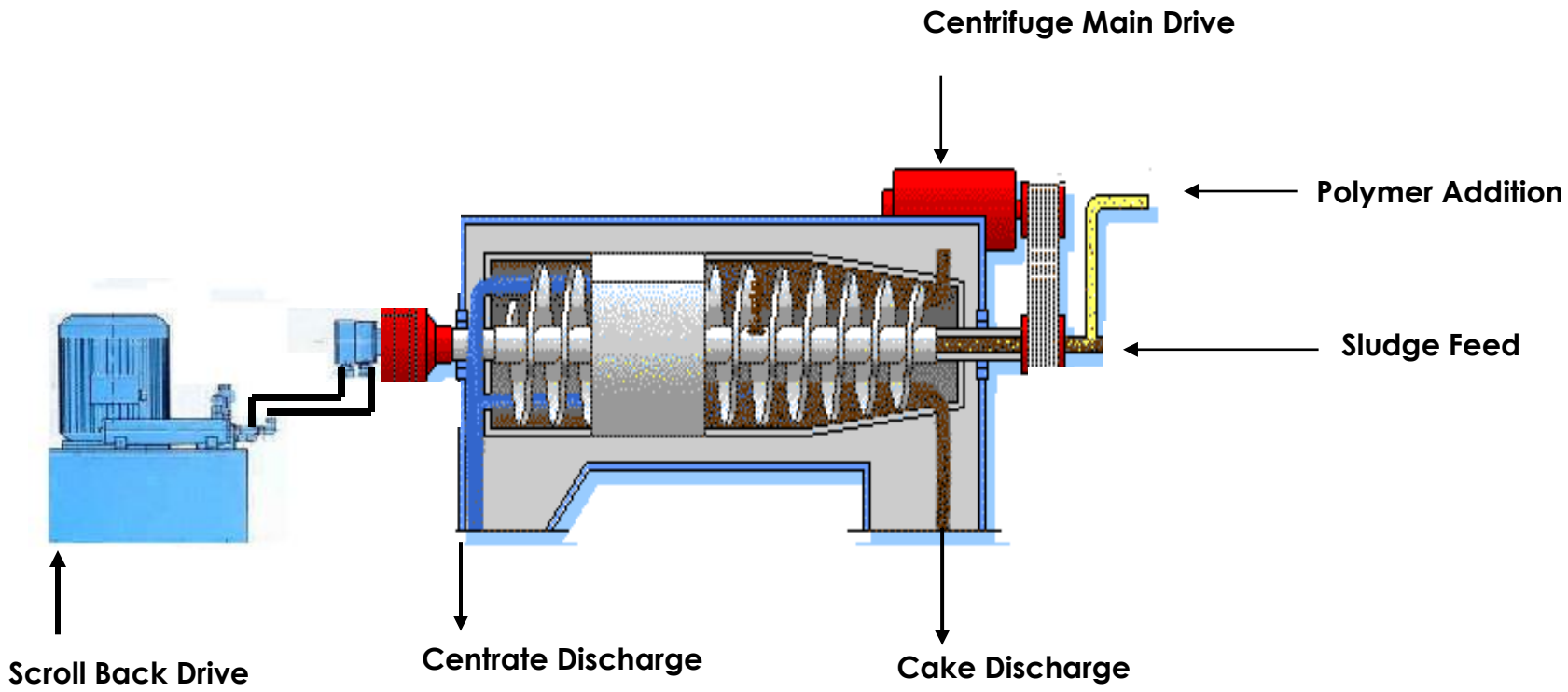


Fig. 2.2 Vessel with small sedimentation height





DECANTER CENTRIFUGE IN OPERATION

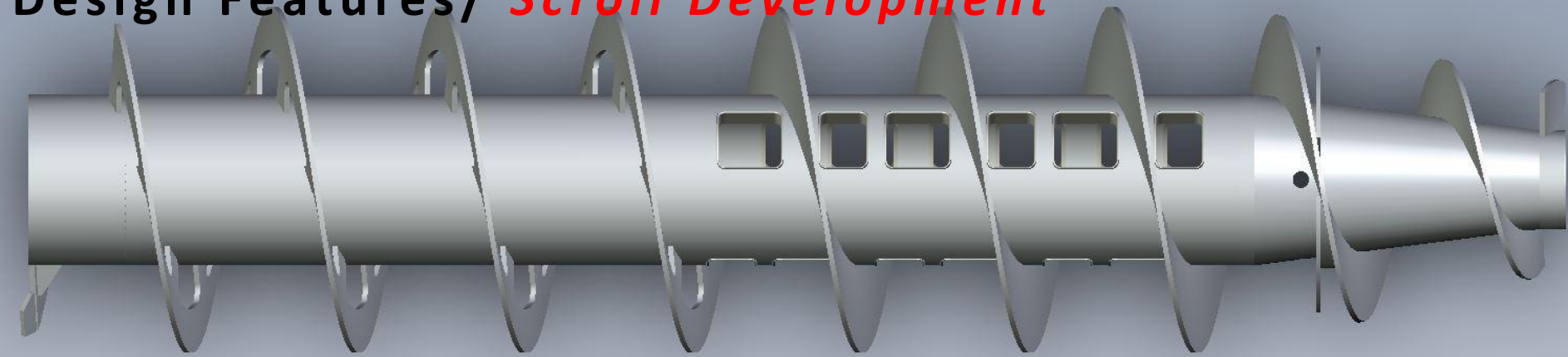


Process Control Continuous Mass Balance

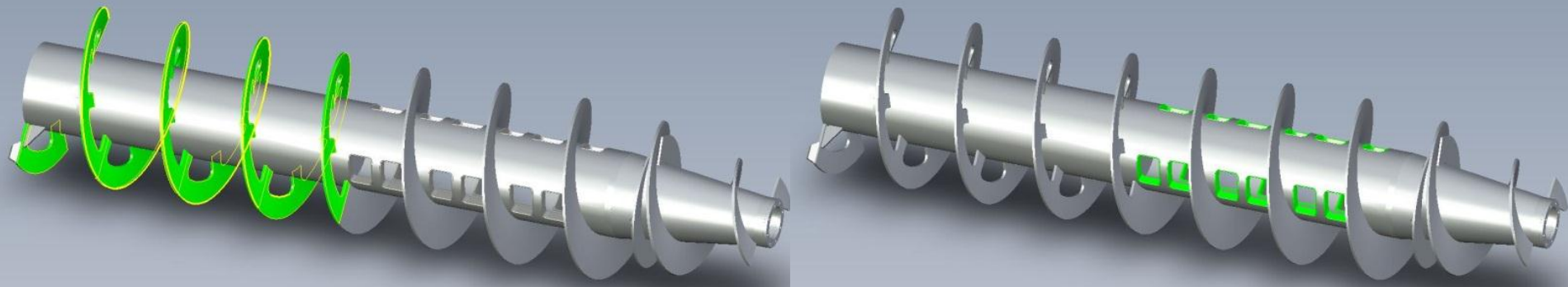


Settling and compression at 3000 x Gravity

Design Features/ *Scroll Development*



centrifugally cast / A890 duplex (comparable to 316 SS but 30% higher tensile strength)
/municipally optimized / wear protected



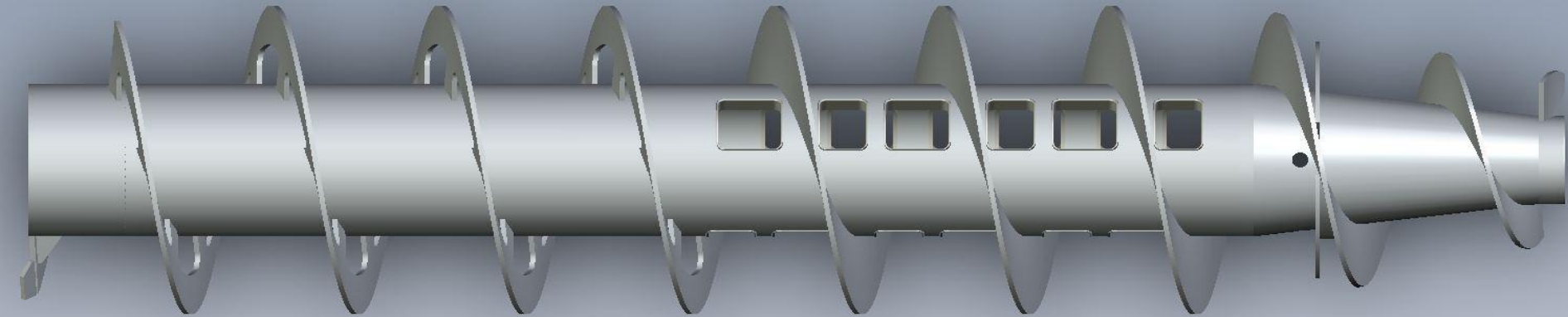
Axial Flow Flights in Cylinder
Reduced Polymer Consumption
Increased Throughput



High Flow Feed Chamber
Low Wear
Gentle Acceleration for Treated Sludge

High Flow / Low Wear Feed Chamber
Optimal Beach Angle for Municipal Applications / 15°
Axial Flow in Cylinder of Conveyor
Drying Disc Technology
Ultra Deep Pool / Narrow Scroll Body

Centrisys

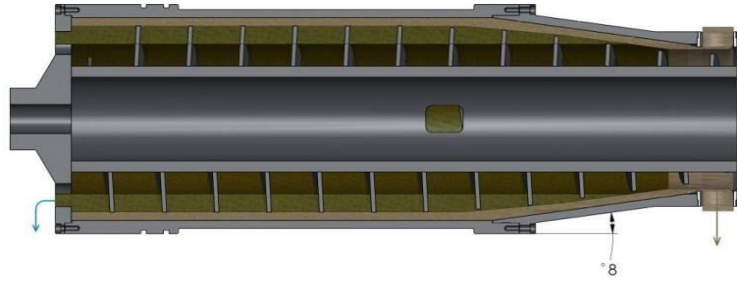


Competition

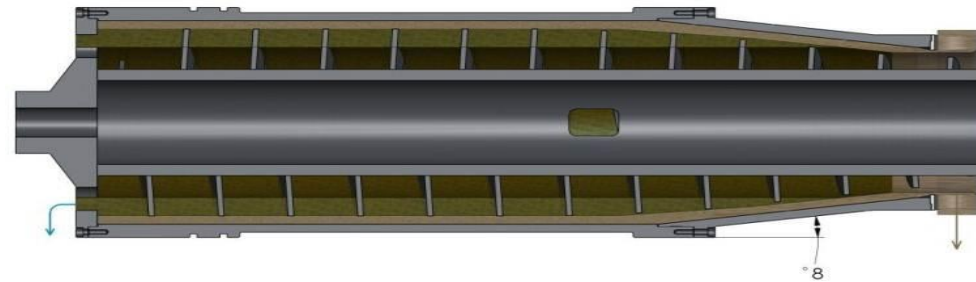
Low Flow / High Energy Feed Chamber Results =
HIGH WEAR
Excessive Beach Angle for Municipal Applications / 20°



BOWL – DESIGN VARIABLES / *LD RATIO*



3 : 1 *LD* ratio



4 : 1 *LD* ratio

The “LD ratio” is the overall internal bowl length \div by the bowl inside diameter in the cylinder

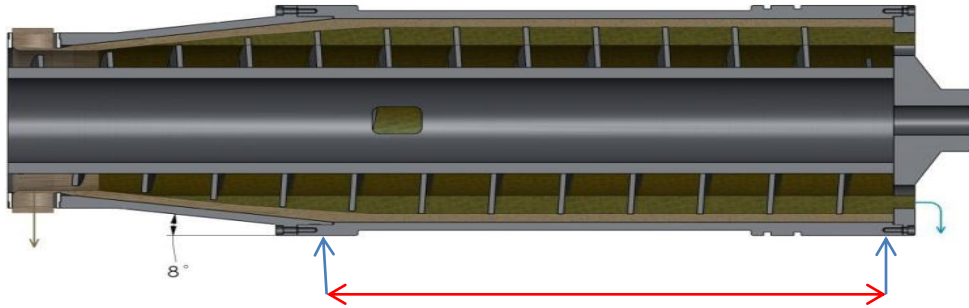
A **smaller LD ratio** is better suited for processes that have **High Specific Gravity Solids that settle well**

A **higher LD ratio** is better suited for **light solids that need more time to settle** from the liquid phase or where liquid clarity is important

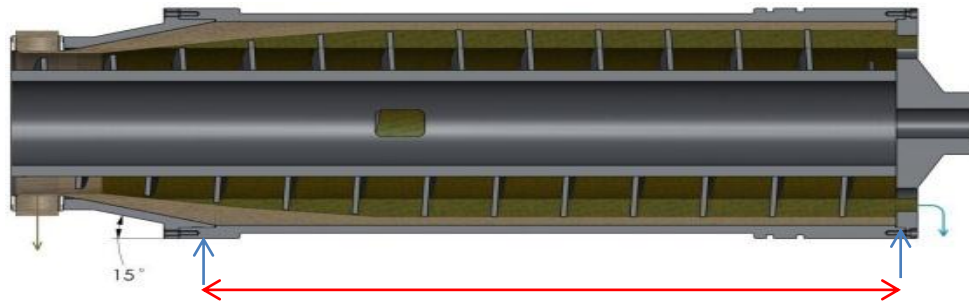
BOWL DESIGN VARIABLES / BEACH ANGLE

The conical bowl is called “the beach”

The “beach angle” can vary depending on applications



8 degree beach
Cylinder = 1000mm



15 degree beach
Cylinder = 1200mm

Two machines - the same length & diameter but with different beach angles offer different capacities

A steeper beach has a longer cylinder = more clarification volume

A steeper beach gives greater capacity provided ALL solids can convey up the beach while maintaining high bowl speed & G forces (15° / municipal)

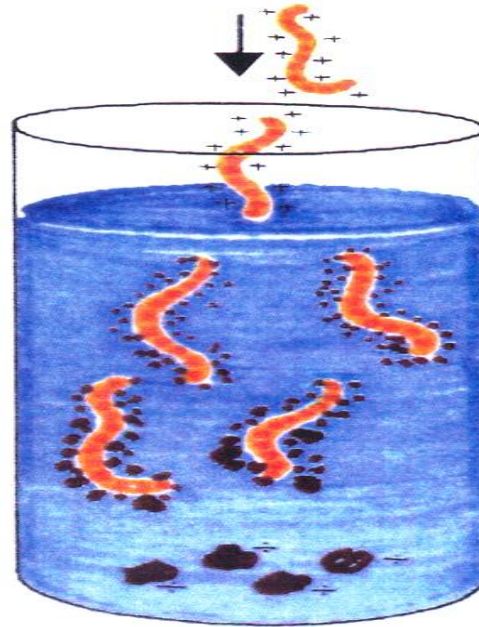
Centrisys tested various bowl angles from 8 - 90 degrees for many applications

Polymers

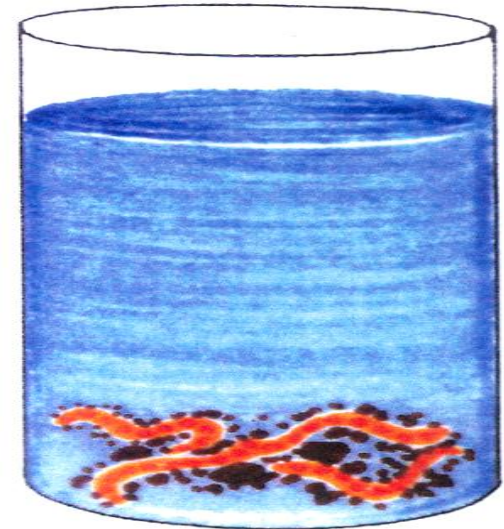
POLYMERS - COMPLIMENTARY ADVANCEMENTS



- ✓ Higher solids
- ✓ Higher Recovery
- ✓ Higher Torque



High molecular weight & High shear resistance

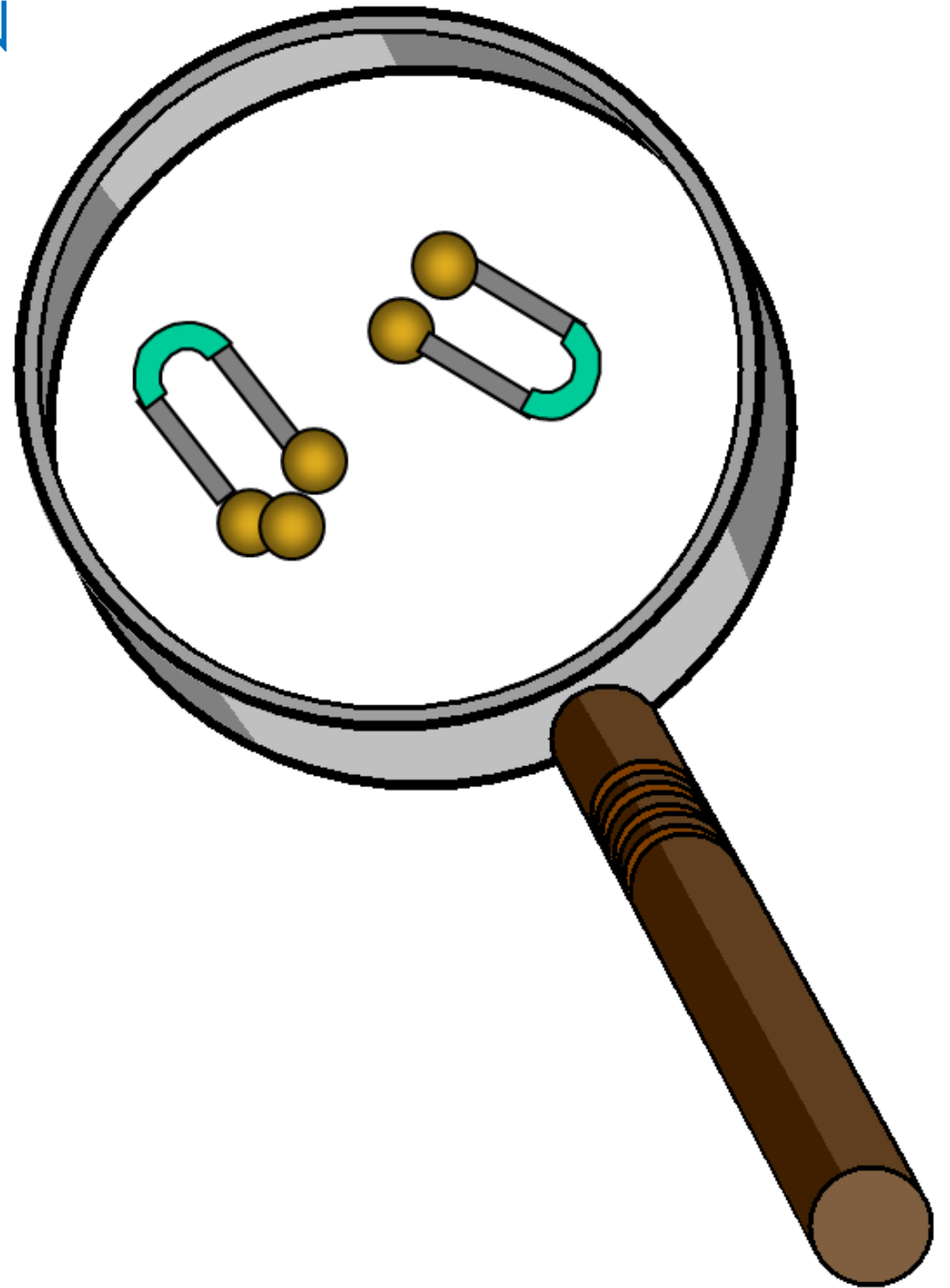


POLYMER FUNCTION

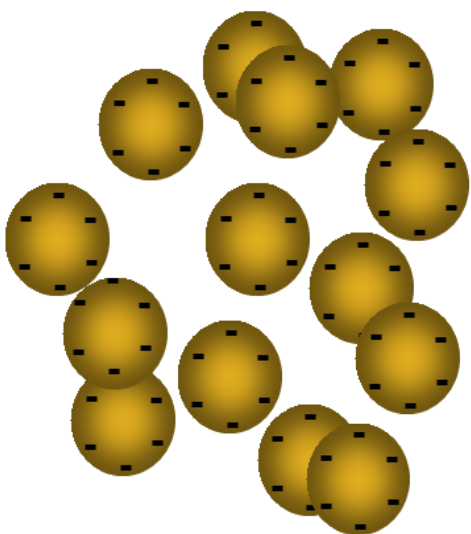
The primary mechanism is electrostatic attraction

Attractions between positive and negative charges

Analogous to magnetic attraction

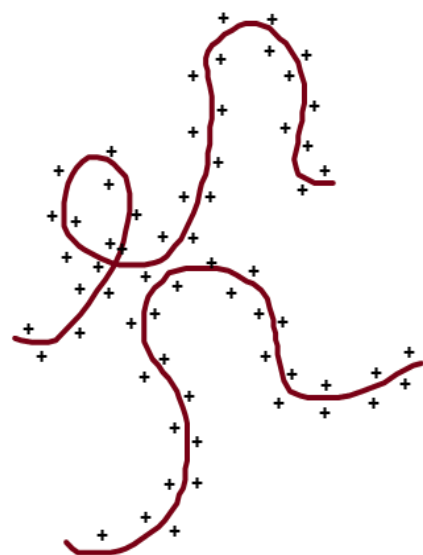


POLYMER FUNCTION

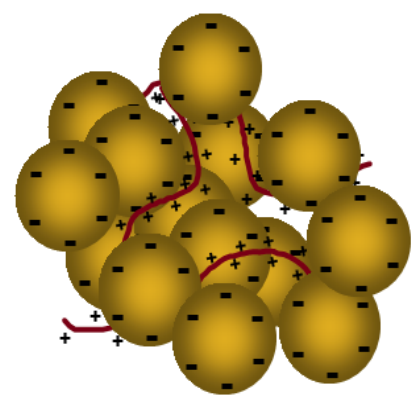
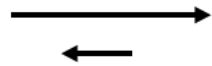


Negative-Charge
Particles

+



Polymer



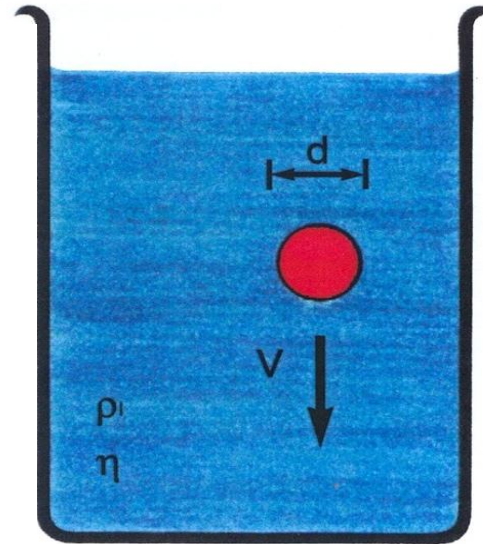
Destabilized
Flocculated
Particles

SEDIMENTATION THEORY

Sedimentation Theory

Sedimentation is influenced by

- ✓ Particle diameter
- ✓ Density difference between solids and liquids
- ✓ Centrifugal force - "G" Force
- ✓ Viscosity of liquid



- ρ_p : Particle density
- ρ_l : Liquid density
- d : Particle diameter
- η : Liquid viscosity

Sedimentation velocity:

$$V = \frac{d^2 (\rho_p - \rho_l)}{18 \eta} \times G \text{ m/s}$$

CENTRISYS KEY FEATURES

- High Speed – High “G” Force all Centrisys centrifuges are designed for the operation of minimum of 3000xG
- ✓ CENTRIFUGALLY CAST DUPLEX BOWL COMPONENTS. ALL PART OF STRUCTURAL PARTS OF THE BOWL ARE CENTRIFUGAL CASTED OR FORGED TO GUARANTEE MAXIMUM PERFORMANCES.
- ✓ DUPLEX STAINLESS HAS 30% HIGHER STRENGTH IN COMPARISON TO 316L AND EQUAL OR BETTER CORROSION RESISTANCE.

CENTRIFUGAL CASTING PROCESS

Centrifugally Cast Bowls
Forged Headwalls
Centrifugally Cast Scroll Body



Centrifugal castings are frequently referred to as “liquid forgings”

In the centrifugal process molten metal is literally forged by the high compressive pressure exerted by centrifugal force

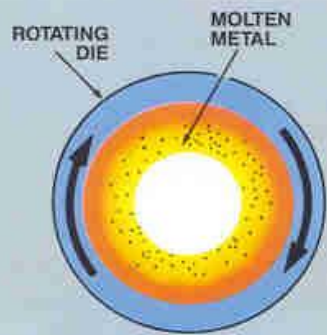
IN SIMPLE TERMS - WE BUILD OUR CENTRIFUGES WITH CENTRIFUGES

CENTRIFUGAL CASTING PROCESS

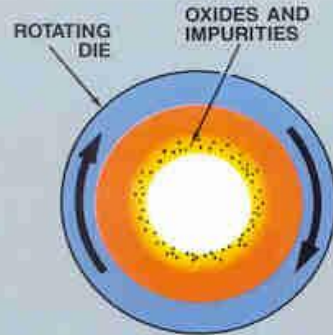
Physical properties such as tensile, creep & fatigue strength are increased by 30% in a centrifugally cast bowl vs. a static cast or fabricated bowl assembly

Centrifugally cast centrifuge components withstand greater overload and strain enabling higher operating speeds for improved process performance

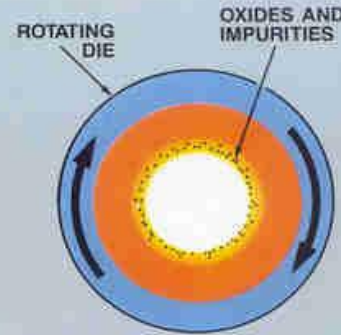
Free from impurities and oxides, the centrifugal cast is a corrosion free / defect free component. Welded or static cast stainless bowls are subject to corrosion and weakness



1.
Directional solidification of sound metal progresses from outside toward the bore.



2.
Oxides and impurities are forced inward; metal is forced centrifugally to outside.



3.
Impurities are concentrated in the bore; the centrifugal is completely solidified.



4.
Impurities are removed by machining, resulting in a defect-free structure.

MATERIALS OF CONSTRUCTION

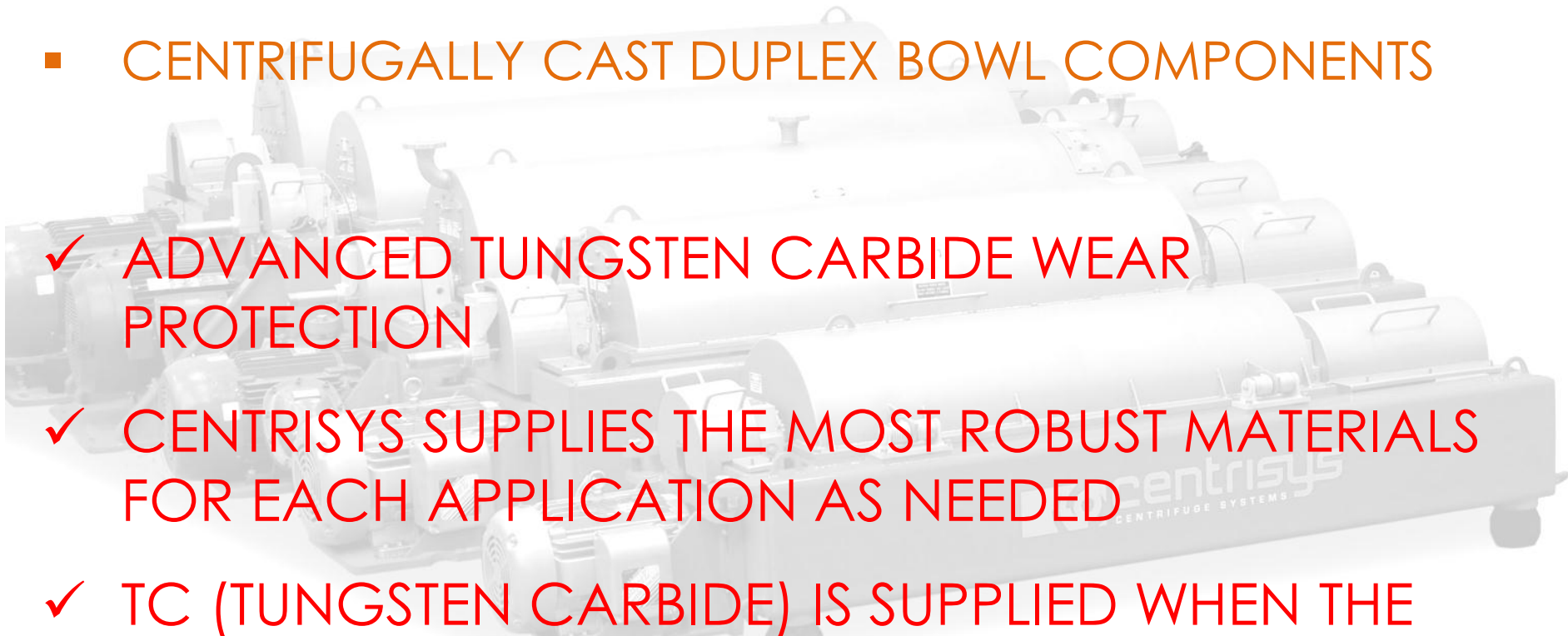


ALL STRUCTURAL COMPONENTS

Centrifugally Cast or Forged for
Ultimate Integrity and Strength

CENTRISYS KEY FEATURES

- HIGH SPEED – HIGH “G” FORCE
- CENTRIFUGALLY CAST DUPLEX BOWL COMPONENTS
- ✓ ADVANCED TUNGSTEN CARBIDE WEAR PROTECTION
- ✓ CENTRISYS SUPPLIES THE MOST ROBUST MATERIALS FOR EACH APPLICATION AS NEEDED
- ✓ TC (TUNGSTEN CARBIDE) IS SUPPLIED WHEN THE CENTRIFUGE REQUIRES PROTECTION FROM WEAR



ADVANCED WEAR PROTECTION PACKAGE STANDARD ON ALL MODELS

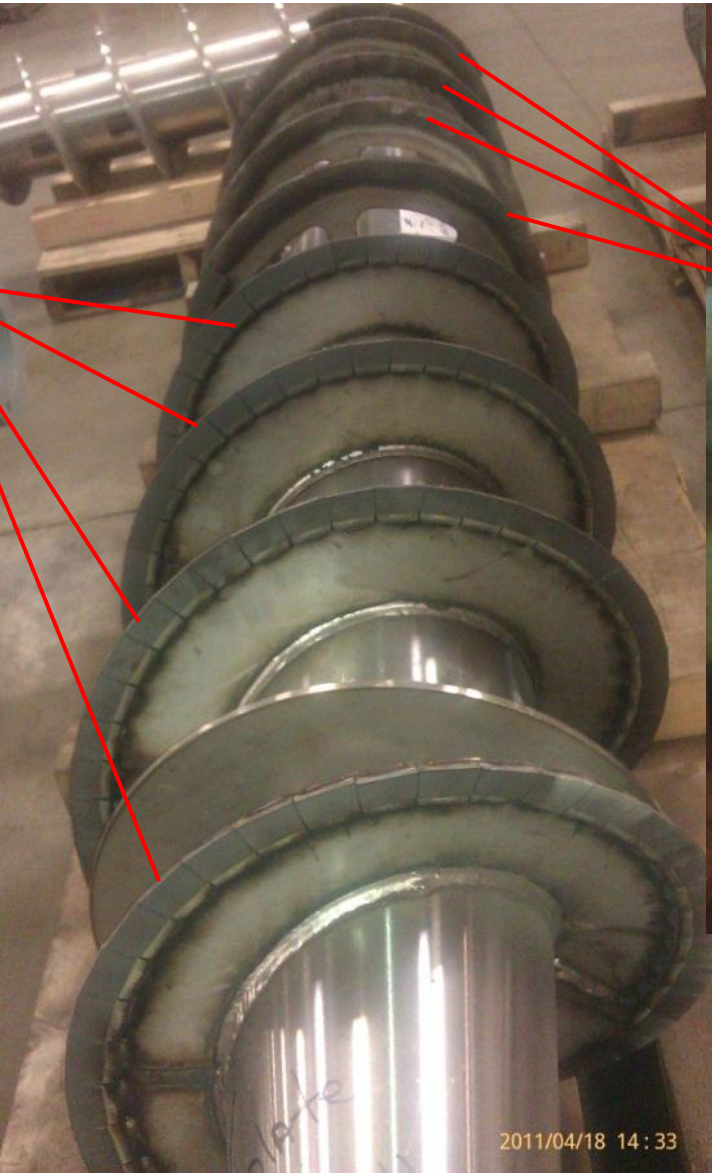


SCROLL – WEAR PROTECTION

flight tips protected with tungsten carbide tiles and spray fused carbide



Tungsten Carbide Tiles

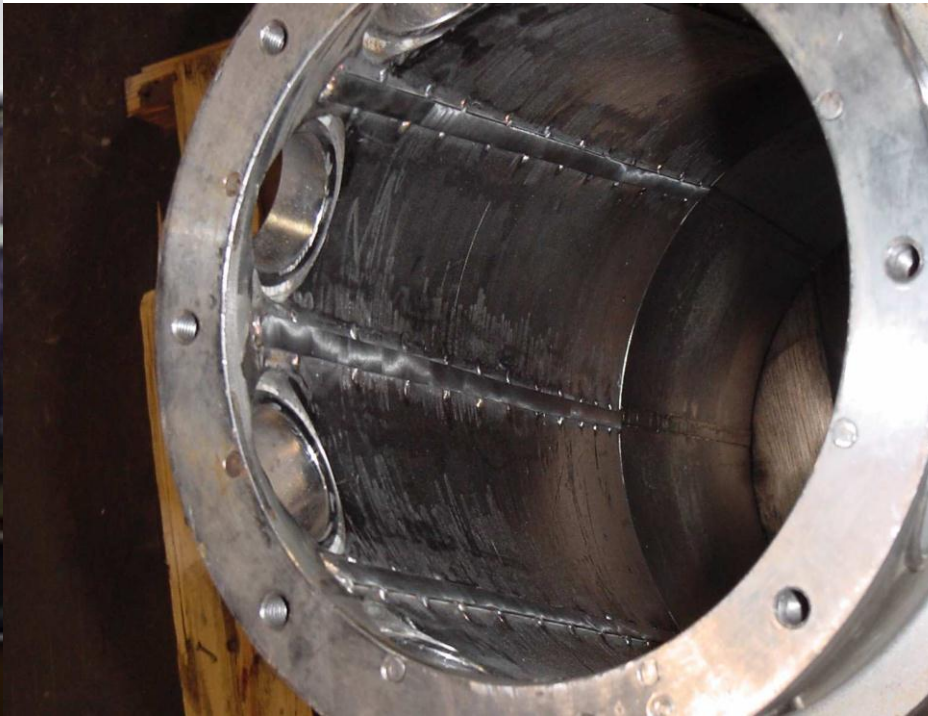


Fused Tungsten Carbide Flame

Bowl – *Wear Protection*

Protected internally
by wear strips

cake discharge
is protected by
tungsten
carbide liners



Key Features

- HIGH SPEED – HIGH “G” FORCE
- CENTRIFUGALLY CAST DUPLEX BOWL COMPONENTS
- ADVANCED TUNGSTEN CARBIDE WEAR PROTECTION

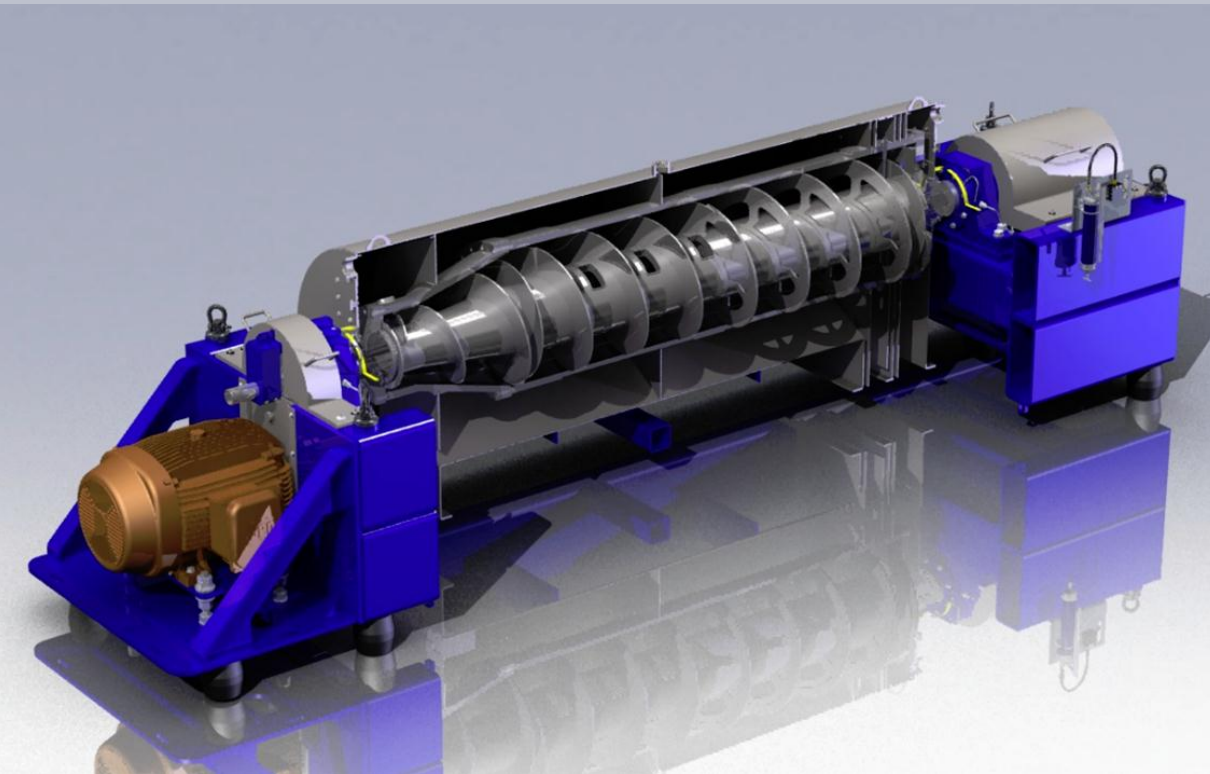
✓ 3D DESIGN

ALL CENTRISYS EQUIPMENT IS DESIGNED IN SOLIDWORKS®
3D CAD SOLUTIONS

ALL CENTRISYS EQUIPMENT IS SIMULATED TO REAL-WORLD
CONDITIONS TO RAISE THE QUALITY OF OUR PRODUCTS
WHILE REDUCING COSTS FOR LIVE PROTOTYPES AND
TESTING

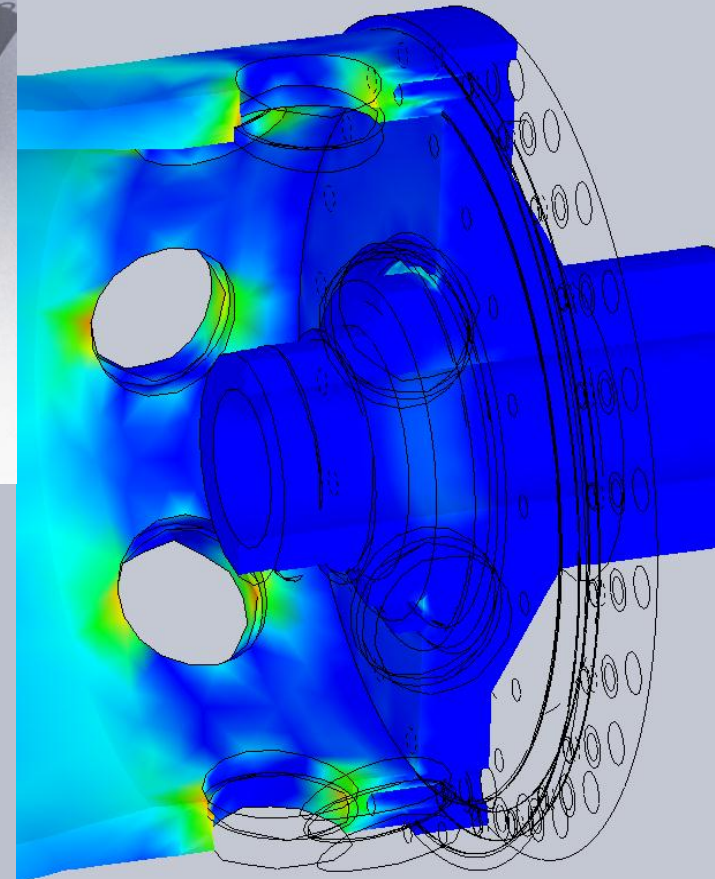
(STANDARD)

3-D modeling of equipment
& systems



(STANDARD)

detailed design
and stress
analysis



3-D MODEL OF A DECANTER TRAILER

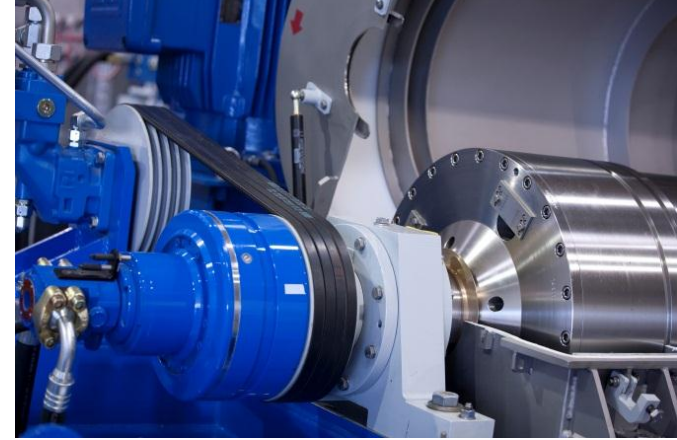


KEY FEATURES

- HIGH SPEED – HIGH “G” FORCE
 - CENTRIFUGALLY CAST DUPLEX BOWL COMPONENTS
 - ADVANCED TUNGSTEN CARBIDE WEAR PROTECTION
 - 3D DESIGN
-
- ✓ HIGHER TORQUE CAPABILITIES OF THE HYDRAULIC MOTOR IN COMPARISON TO THE CYCLO REDUCERS OR PLANETARY GEAR DRIVES
 - ✓ LOWER OVERHANG LOAD ON MAIN BEARINGS DUE TO LIGHTER WEIGHT AT SAME TORQUE OUTPUT
equals in less stress on main bearing

THE CENTRISYS SCROLL DRIVE SYSTEM WITH ROTODIFF® TECHNOLOGY

**the most efficient in the
industry**



- ✓ VFD Controlled/ power run- thru technology
- ✓ Lowest Installed HP for similar size machines
- ✓ Unmatched Reliability / a trusted technology in any environment
- ✓ Increased solids loading capacity
- ✓ Easy to Maintain
- ✓ Lower Operating Costs
- ✓ Simple and accurate measurement of scroll speed
- ✓ Highest torque-to-weight ratio
- ✓ 100% torque at all speeds(including stand-still)
- ✓ Low energy consumption(power is not lost or wasted)
- ✓ Simple – Compact – Lightweight
- ✓ Versatile design for multiple applications

SCROLL DRIVE EVOLUTION

today's technology

- ✓ HIGH EFFICIENCY
- ✓ HIGH TORQUE
- ✓ LOW WEIGHT



2080-D Rotodiff
Weight: 170kg/375lbs
Torque: 25,400Nm



2071-D Rotodiff
Weight: 82kg/180lbs
Torque: 13,000Nm

CENTRISYS IS A GLOBALLY RECOGNIZED LEADER OF

- ✓ **Innovative + Focused** Centrifuge Technology
- ✓ **Expert** Dewatering Process Knowledge for municipal and industrial applications
- ✓ The Most **Comprehensive** Range of High Efficiency Scroll Drive Systems in the Industry

SCROLL DRIVE EVOLUTION

today's
technology



2080-D Rotodiff
Weight: 170kg/375lbs
Torque: 25,400Nm



2071-D Rotodiff
Weight: 82kg/180lbs
Torque: 13,000Nm

yesterdays
technology



P180 Gearbox
Weight: 460kg/1012lbs
Torque: 20,340Nm

1970 Technology



112T Rotodiff
Weight: 550kg/1210lbs
Torque: 27,646Nm

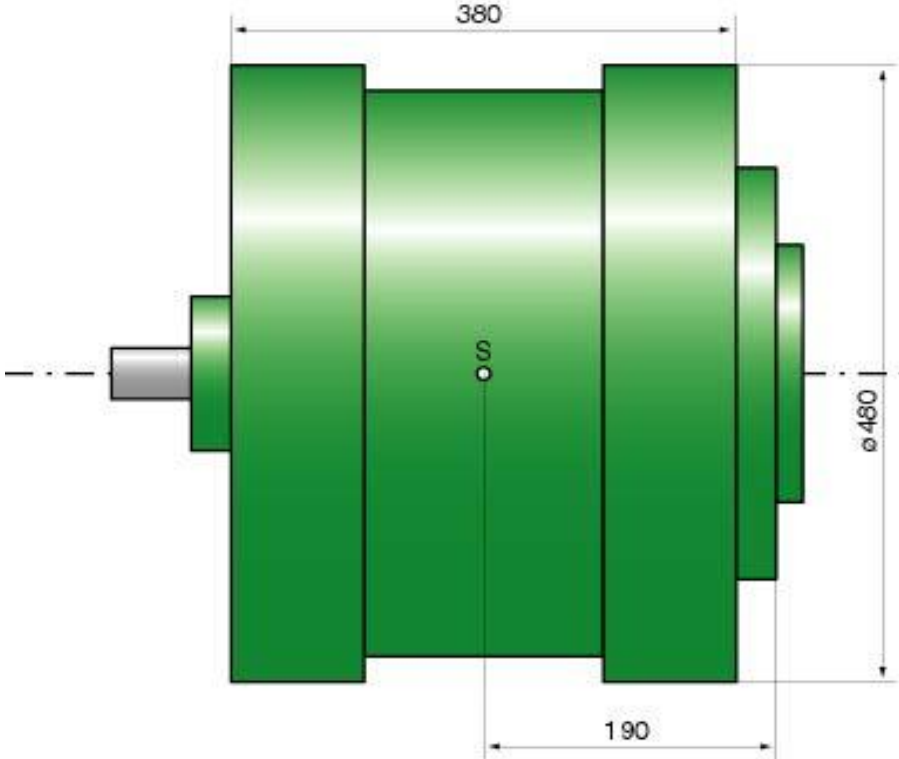
1980
Technology



Double-Cyclo Drive
Weight: 312kg/686lbs
Torque: 8800Nm

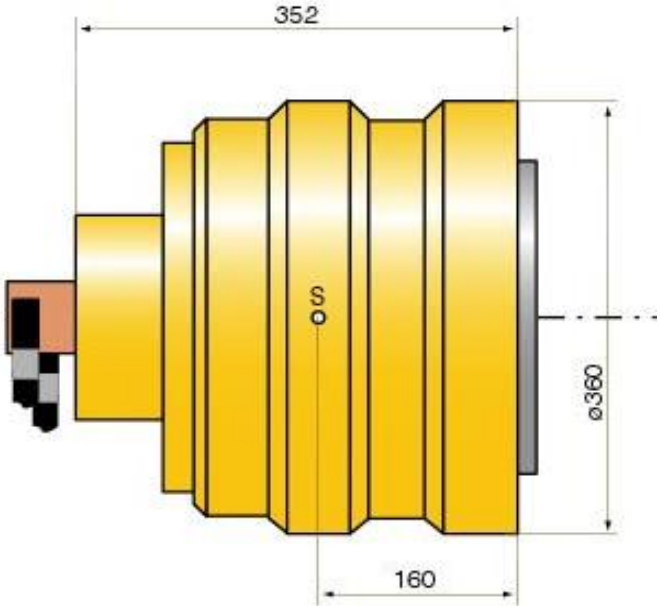
1970 Technology

COMPARISON



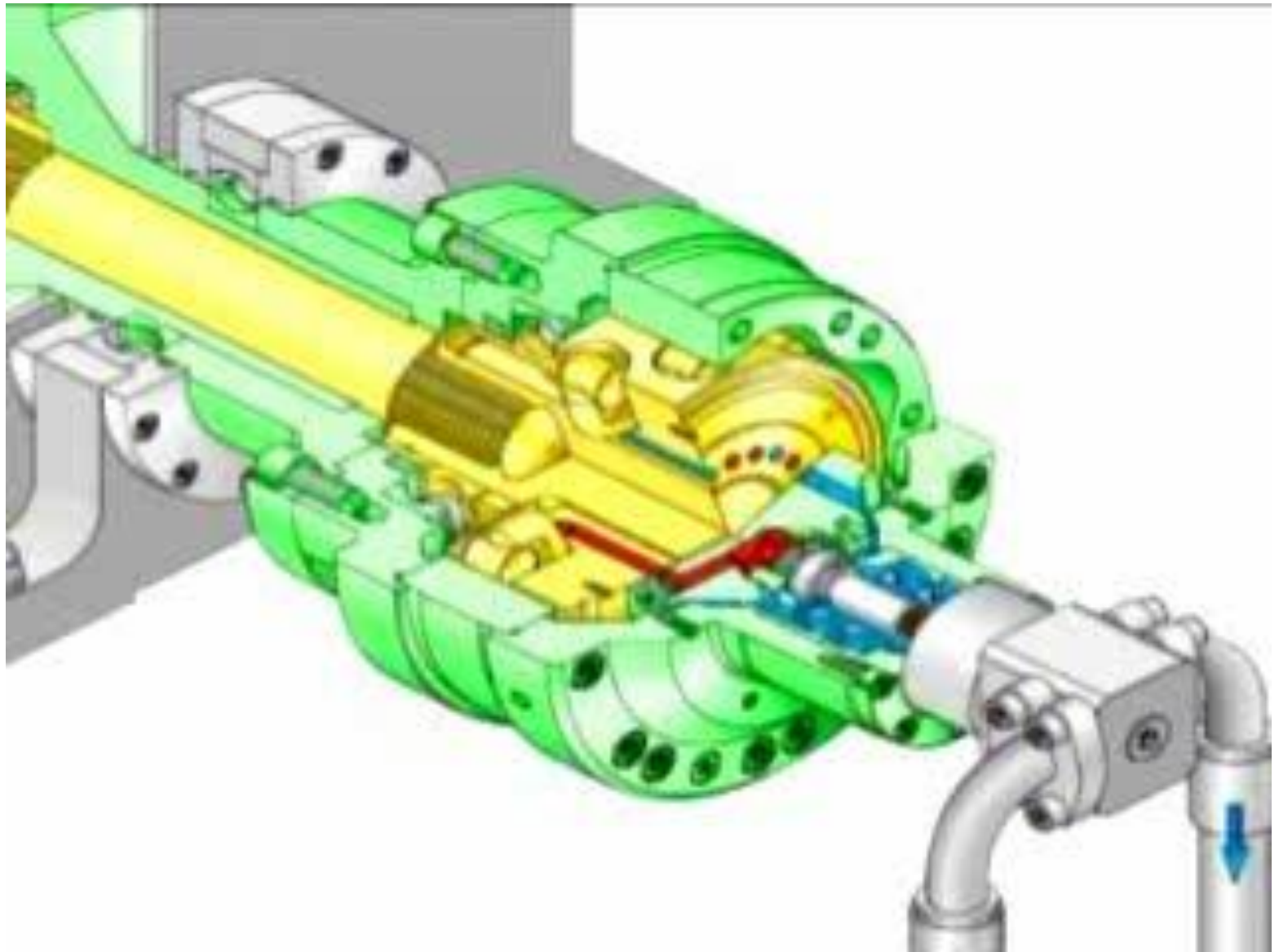
Torque: approx. 232330 Nm

Weight: 1018 lbs

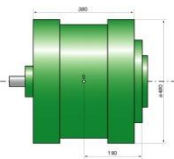
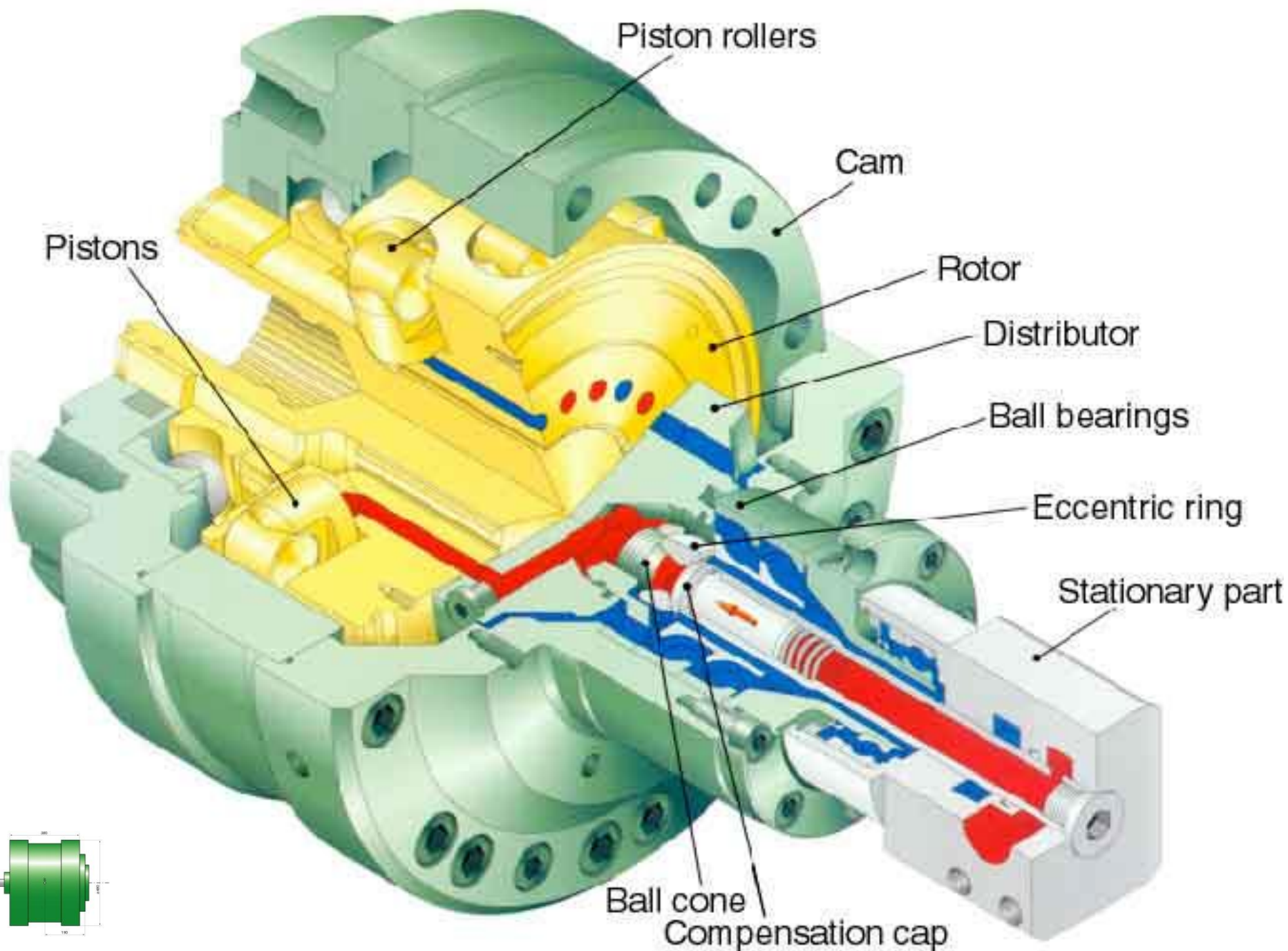


approx. 223040 Nm

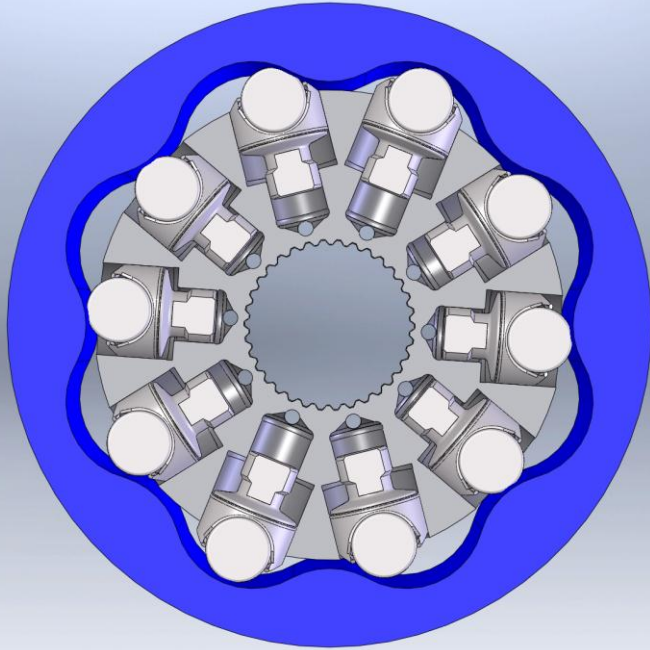
422 lbs



[Click for video](#)

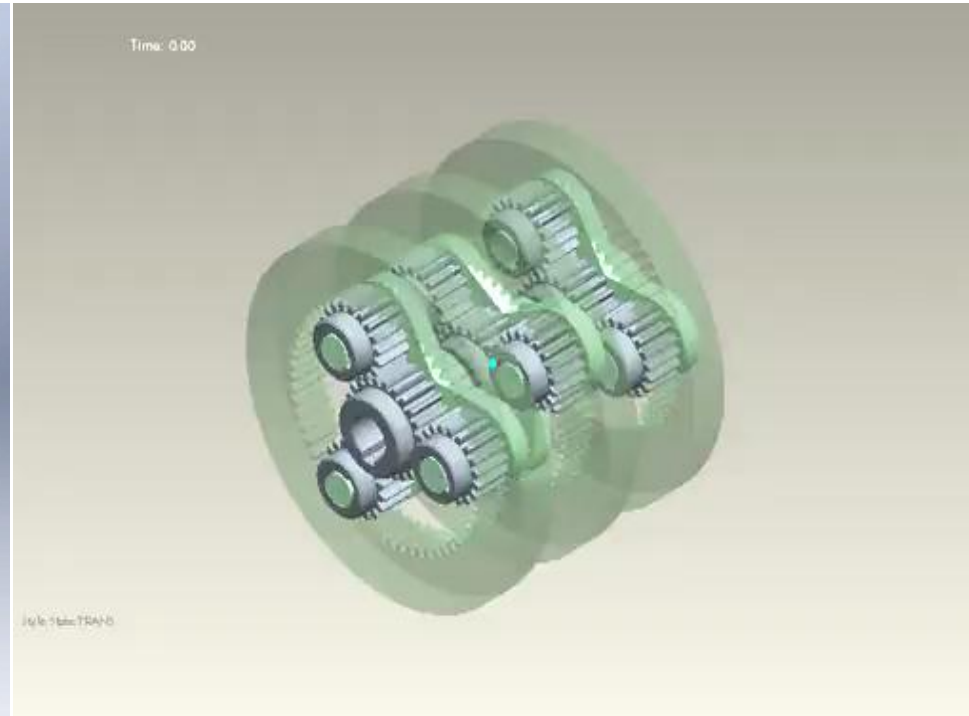


SCROLL DRIVE COMPARISON



[Click to Play Video](#)

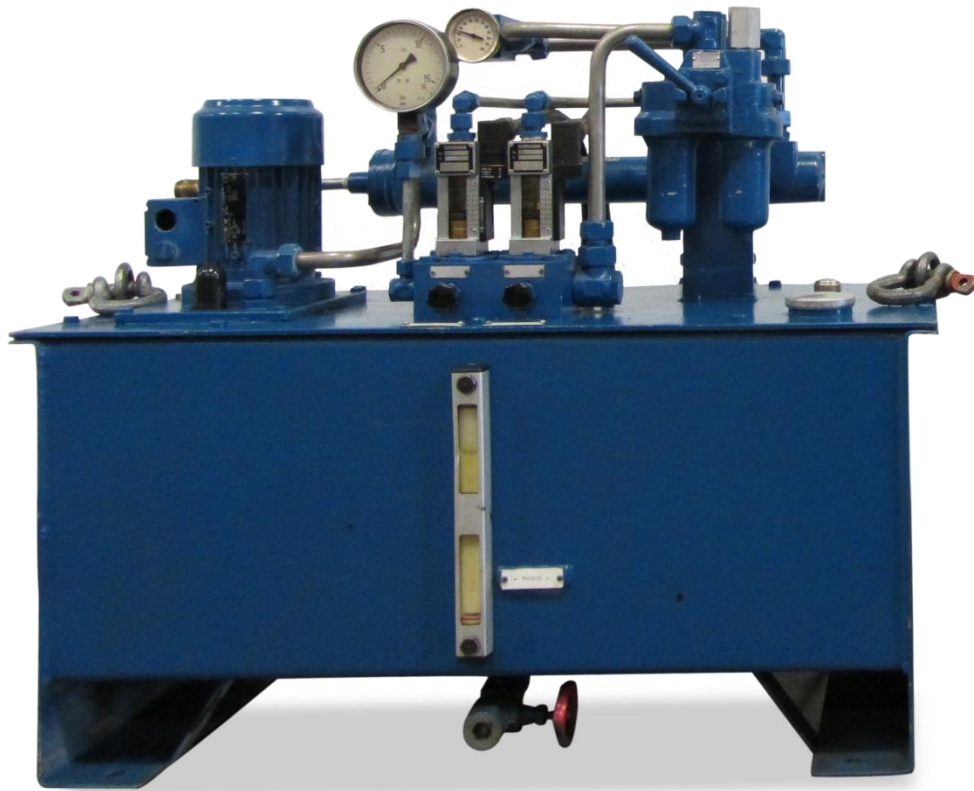
Slow Speed
High Torque
Low Weight



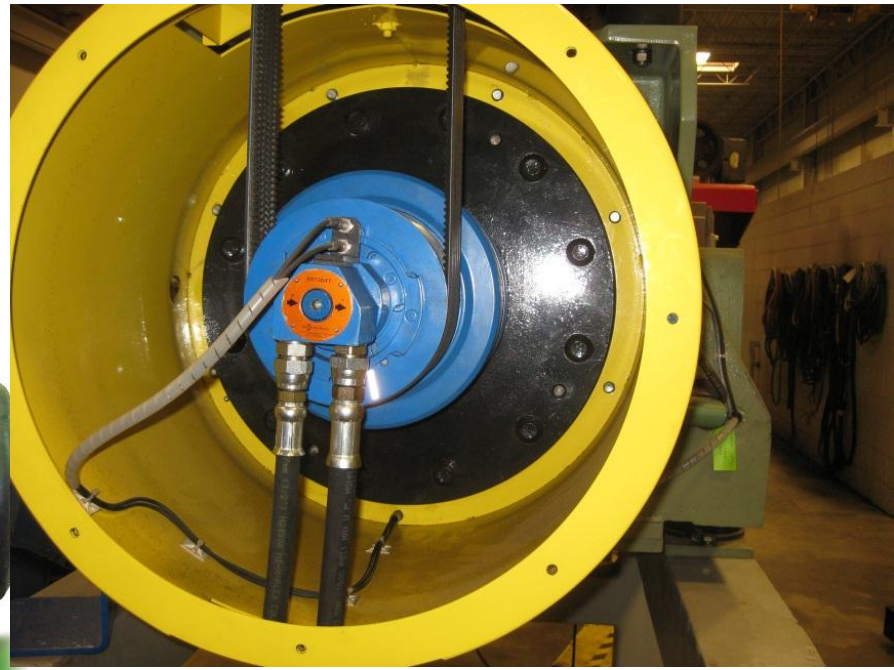
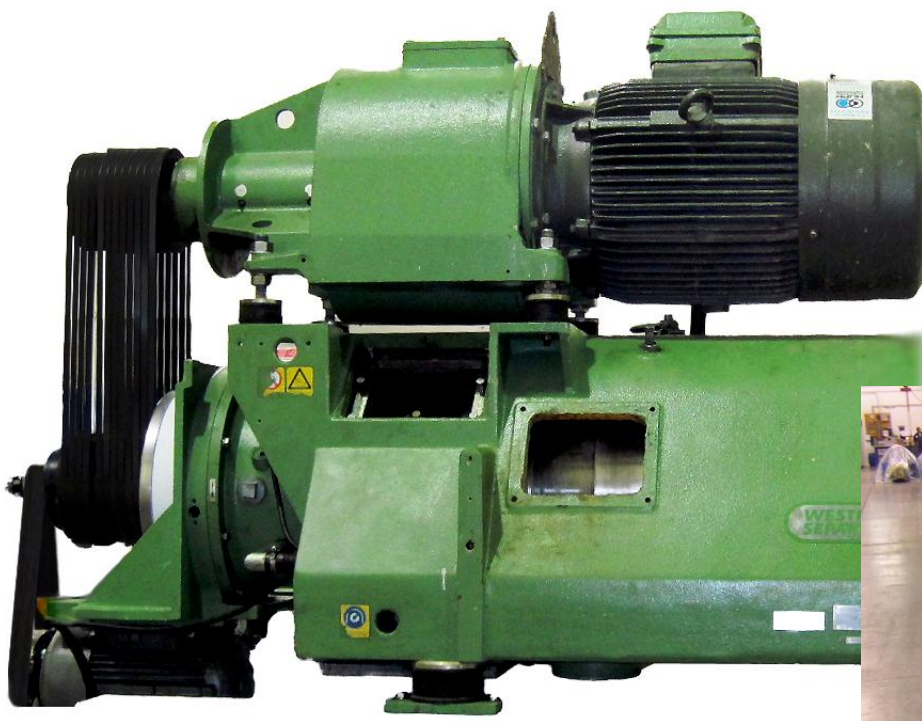
[Click to Play Video](#)

High Speed
High Torque
High Weight





SYSTEM INTEGRATION



INTEGRATED PROCESS CONTROL

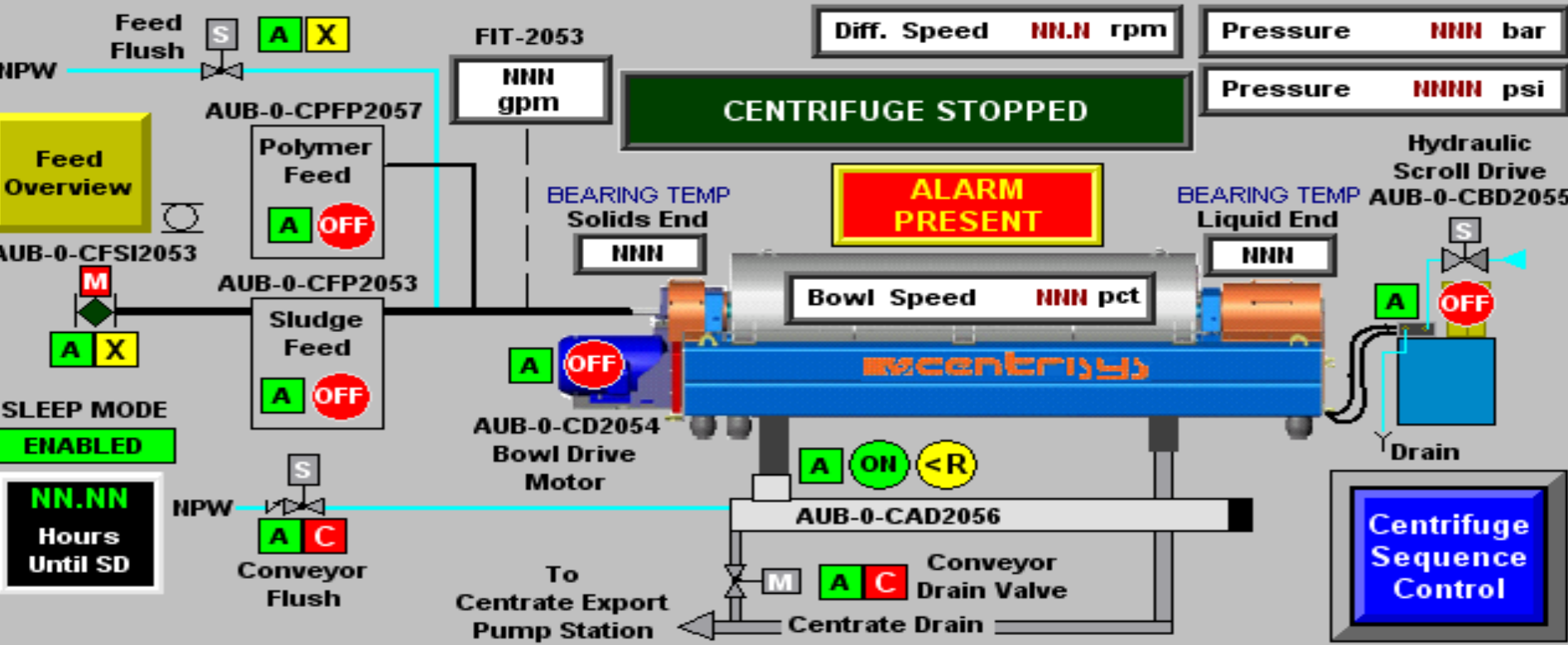
continuous monitoring of process & mechanical operation

USER: sssssssssssssssssssss

SYSTEM OVERVIEW

10:29:29 AM

3/14/2008



- Drive System
- Conveyor System
- Sludge Feed System
- Polymer Feed System
- Flush Valves
- System Monitor
- Active Alarms

ABCDE FGHIJK LMNOPQ RSTUV WXYZ ABCDE FGHIJK LMNOPQ RSTUV WXYZ

- System SP's
- MAIN

ISO 9001: 2008 Certified Facilities

