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# Drum Unheading Technology to Enhance Safety and Productivity



Rio De Janeiro, August 3 - 7, 2009



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# Agenda

- Z&J's history - proven reputation since 1877
- Delayed Coker, workhorse of the refinery
- DC - need for innovation - high standards
- Z&J Double Disc - Triple Seal - Unheading Technology
- Z&J's *UNIQUE* Technology that makes the difference



# Z&J's History - Proven Reputation



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1877

Large diameter valves

Manufacturing plant in Düren, Germany

Solid reputation Steel - Glass - Ethylene - FCC



Kaltwindschieber

*Vanne à vent froid*



Kaltwindschieber

*Vanne à vent froid*

1920

First Delayed Coker - Standard Oil, Whiting, Indiana

1955

DC industry growth in the U.S.A

1999

Z&J - DC - isolation

2004

Z&J - DC - top unheading

2005

Z&J - DC - bottom unheading

# Z&J's History - Proven Reputation



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2009

Nearly 25 % market share of global  
Delayed Coking unheading applications



# DC Industry in need for Innovation, sets High Standards

**Based on the input of the DC industry, Z&J recommends**

**DOUBLE DISC TRIPLE SEAL**

**High standards for both Top Unheading & Bottom Unheading**

**SAFE, ECONOMIC, ROBUST & DURABLE  
RELIABLE, SIMPLE TO OPERATE**

# Double Disc vs. Single Plate Slide Valve



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## Single Rectangular Plate

- Random temperature distribution
- Sensitive to distortion
- Resulting in leakage & excess steam consumption



## Innovative Double Disc Design

- Round disc, more equal temperature distribution
- Limited distortion, less deformation
- 10 x less risk to leaks
- Best choice for DC applications



# Z&J's Unique Technology<sup>(1)</sup>



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- Double Disc - Triple Seal & Purge - 100% tight
- Circular discs
- Active seating force
- Scraper and guide plates avoid coke fines entering body
- No cooling water
- Manual or automated blocking pin

SAFETY

- Ability to throttle coke & water mixture
- Minimize maintenance downtime
- No need for capital spare parts
- Low steam consumption

ECONOMICS  
BOOSTING CAPACITY

# Z&J's Unique Technology<sup>(2)</sup>



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- Actuator(s) outside of valve body
- 100% actuator redundancy
- Pneumatic driven emergency HPU cart

FEATURES

- Actuator options, customized to fit
- Solution to overcome weight aspect
- Revamp engineering, design and execution of lower drum section

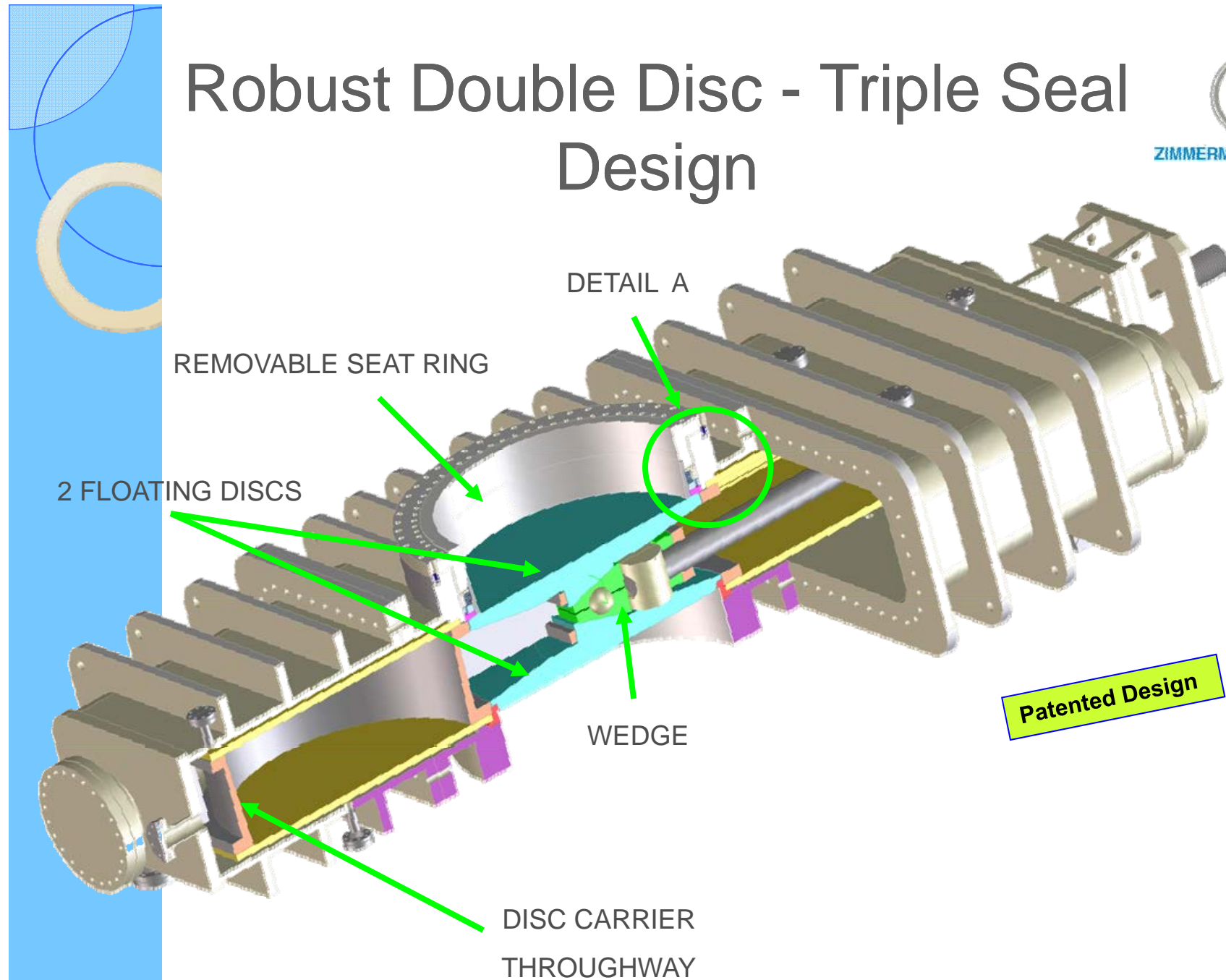
TAILOR-MADE



# Robust Double Disc - Triple Seal Design



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# Double Disc - Triple Seal



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## REMOVABLE UPPER SEAT RING

SCRAPER EDGE

GUIDE PLATE

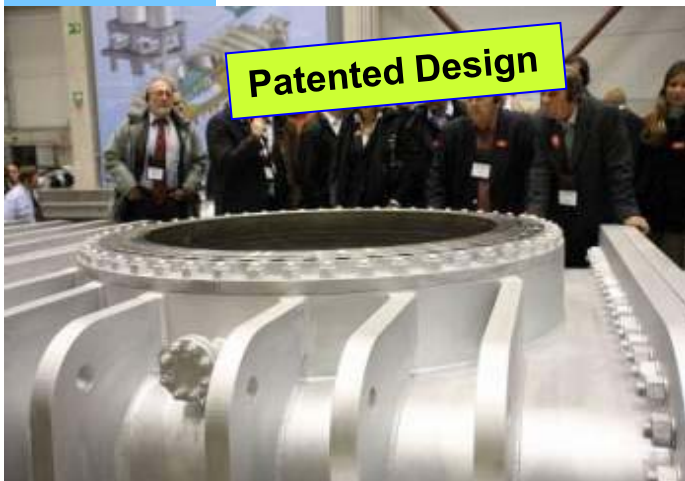
SPRING LOADED SEAT

SEAL STEAM BETWEEN  
TWO SEATS

HARD - FACED SEAT

DISC

**Patented Design**

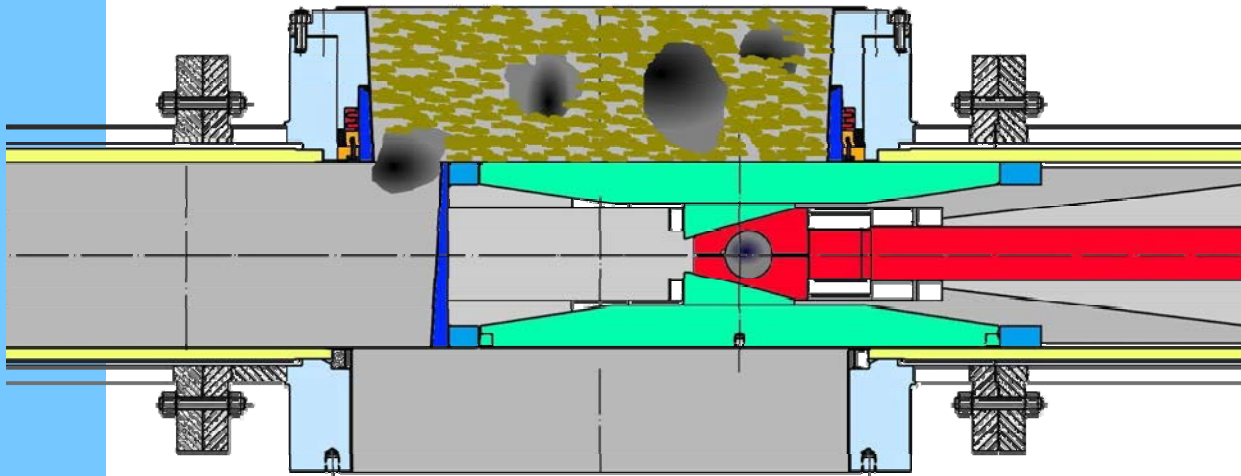


# Unique Technology



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Active seating force



SAFETY

Helps sealing and avoids possible deformation

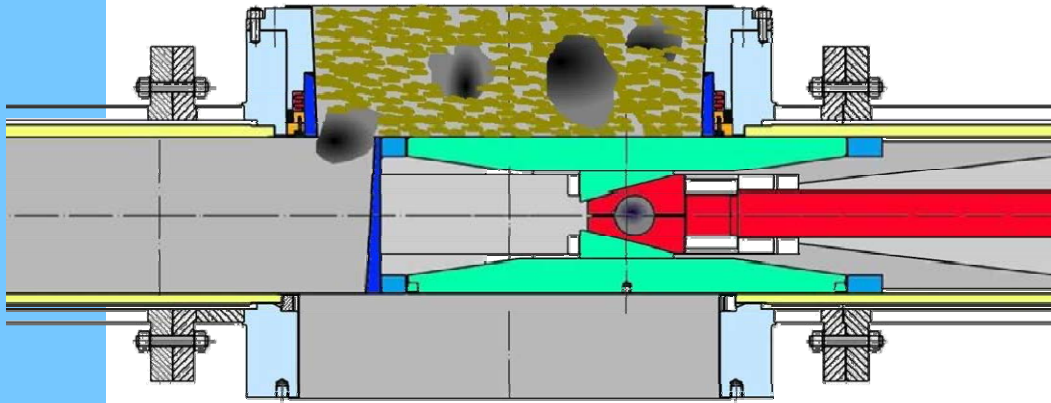
Controlled discharge

# Unique Technology



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Scraper & guide plates avoid coke fines to enter valve-body



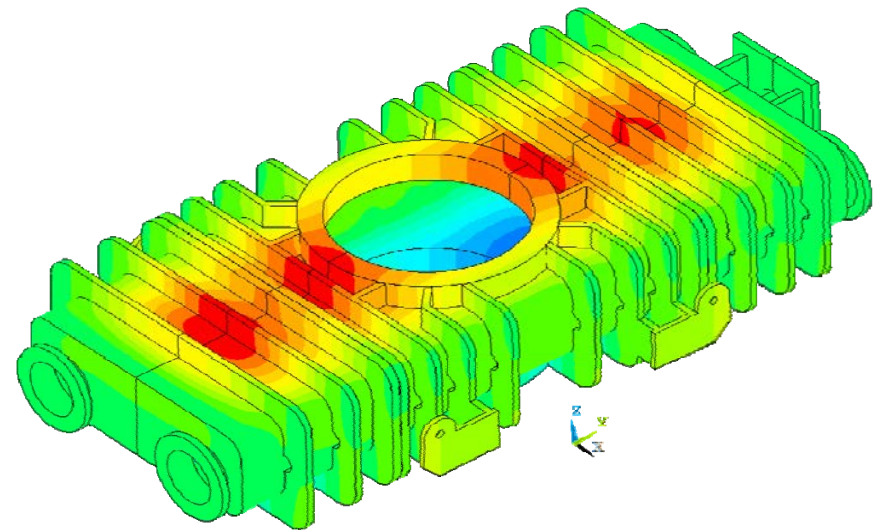
SAFETY

Disc is maintained against seat / scraper at all times by means of pretensioned springs to avoid coke fines to enter valve-body

# Unique Technology



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SAFETY

Comfort in freezing conditions  
No cooling with glycol

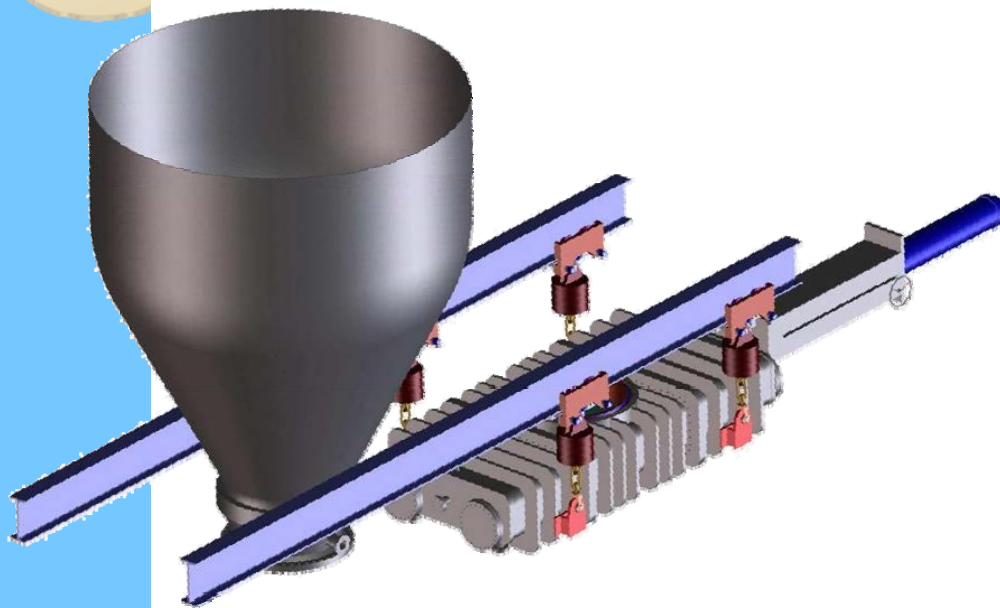


# Unique Technology



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Inspection - Maintenance Position - TA



ECONOMICS  
BOOSTING CAPACITY

Minimize downtime & maintenance cost  
No need to dismantle body for valve inspection  
and maintenance on upper seat and upper disc  
if needed

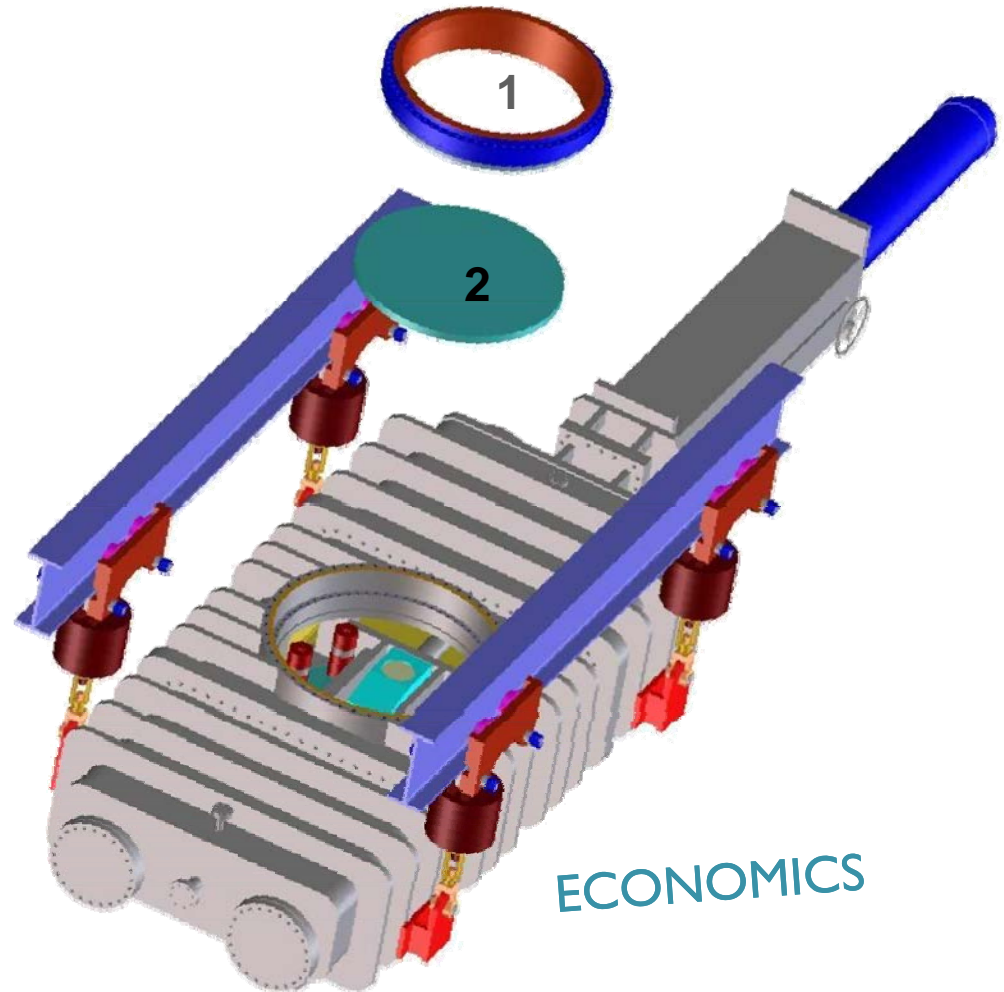
# Unique Technology



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Inspection - Maintenance Position - TA

Only 2 gaskets to replace





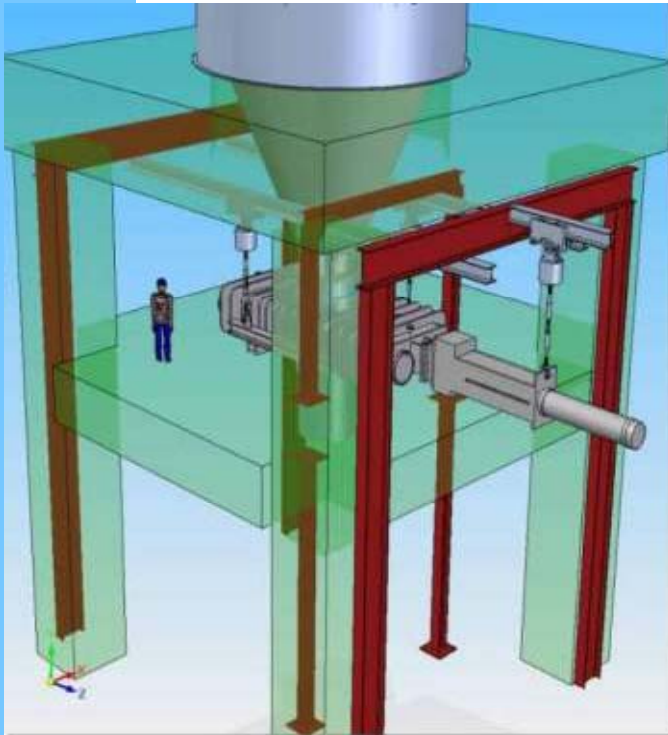
# Technology Solution



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Solution to overcome weight aspect

Coker Upgrade: Engineering - Design - Execution Assistance



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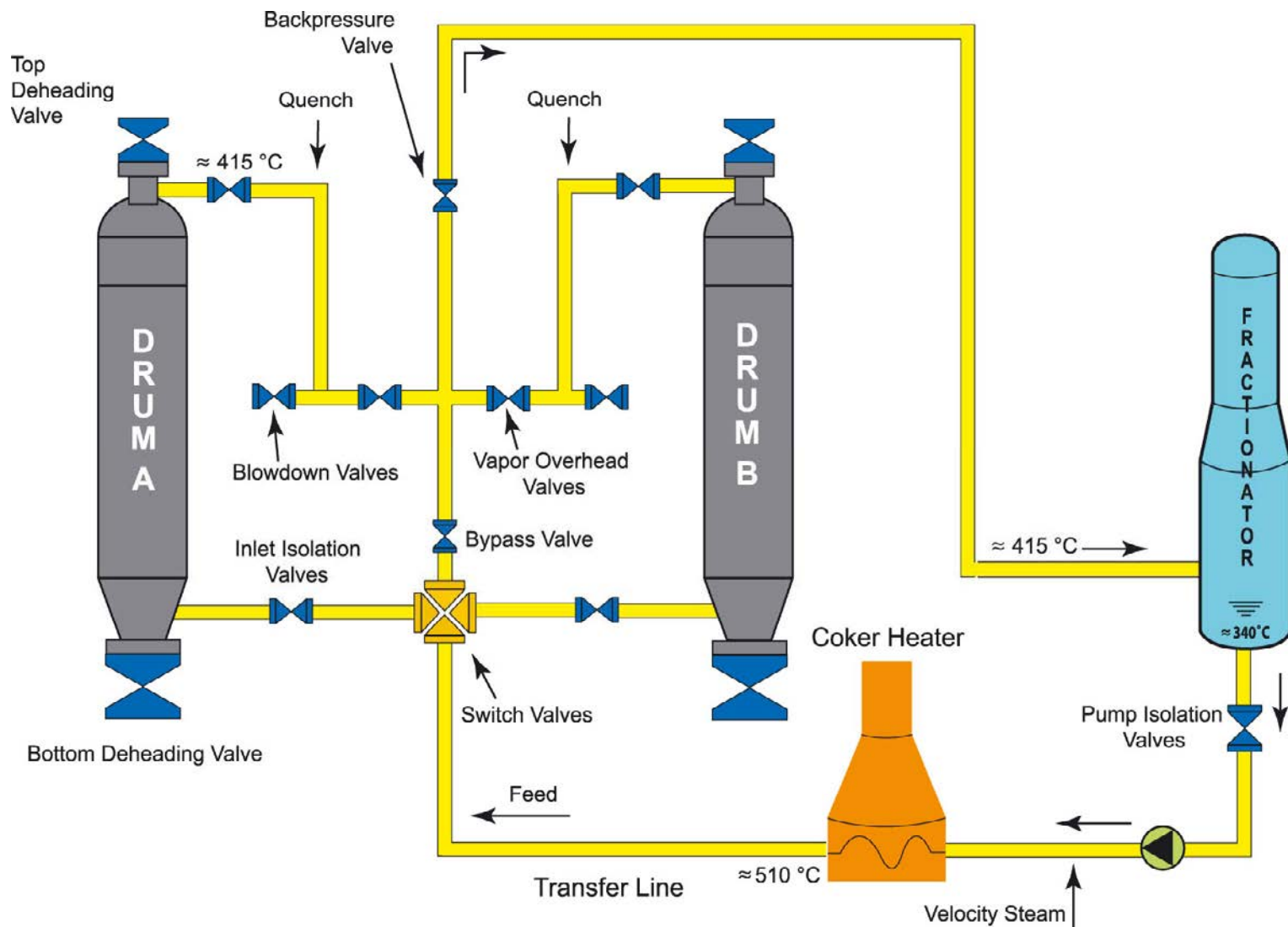
Supporting beams to reinforce structure

Spring hangers to minimize load on drum

# Z&J Technology Applications



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# DC Product Offering



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Isolation



Top Unheading



Spring Hangers



HPU

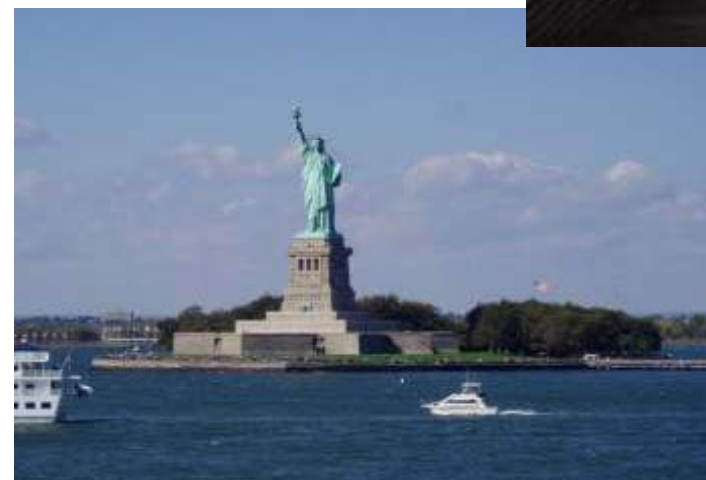


Bottom Unheading

# Global Presence & Support



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# Bottom Unheading - Inspection



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Patented Design

# Supervision Installation & Commissioning



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# Production Capabilities



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Large Production Area & continued hiring of qualified Personnel







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# Delayed Coking Unheading Technology

## Thank You !

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