

Greerco™

High Shear Mixers



NOV



Batch or Continuous Flow High Shear Mixers



Mixing Mechanism

- High speed rotor spinning in close proximity to a fixed stator
- The first mixing zone utilizes sharp stator teeth to mill the fluid
- Next, fine serrations accelerate the fluid between the ultra smooth, hardened surfaces of the spinning rotor and stator gap
- Finally, centrifugal forces impinge fluid on the stator wall for additional refinement

Applications

- Emulsification
- Solids Incorporation
- Homogeneous Dispersions
- Solids Deagglomeration
- Rapid Blending
- Particle Size Reduction
- Prepackaging Product Refinement

Versatility

The Greerco Colloid Mill is the most versatile high shear mixer available. With a simple turn of the wheel, you can achieve the process results you have been looking for.

- The rotor-stator gap can be adjusted on the fly by turning a hand wheel
- Changing the gap setting allows the user to modify the shear rate applied to the fluid and achieve the desired process results
- Indicator dial defines gap setting position and ensures process repeatability
- This machine is designed to handle a wide range of applications and empowers the user to make simple adjustments to achieve the precise product qualities they require
- Vertical or horizontal mounting position makes our mill ideal for batch, batch-continuous or inline applications

Cost Effective Solution

Initial Investment

Unlike competitive designs, the versatility of the Greerco Colloid Mill eliminates the need for the costly additions typically offered to achieve optimal process results.

Process

Easy installation and operation maximizes process productivity while reducing cost.

Longevity

Time tested design has been proven to provide years of continuous operations with minimal maintenance costs.



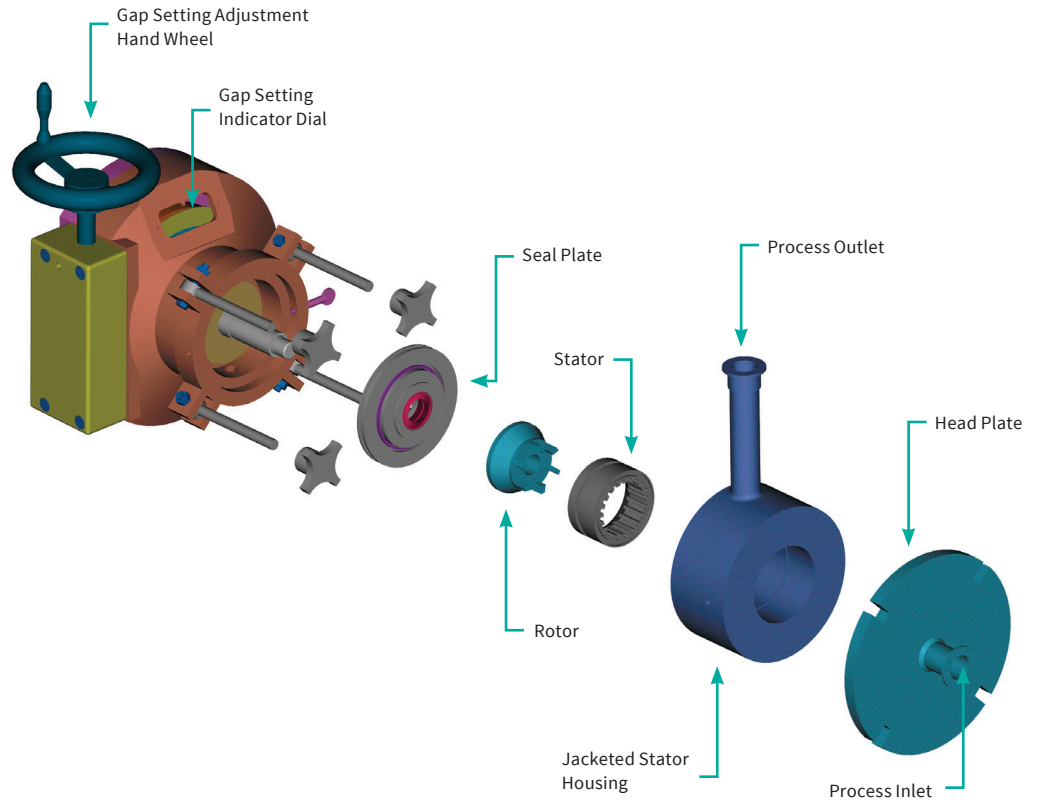
W200V

Standard Mill Construction

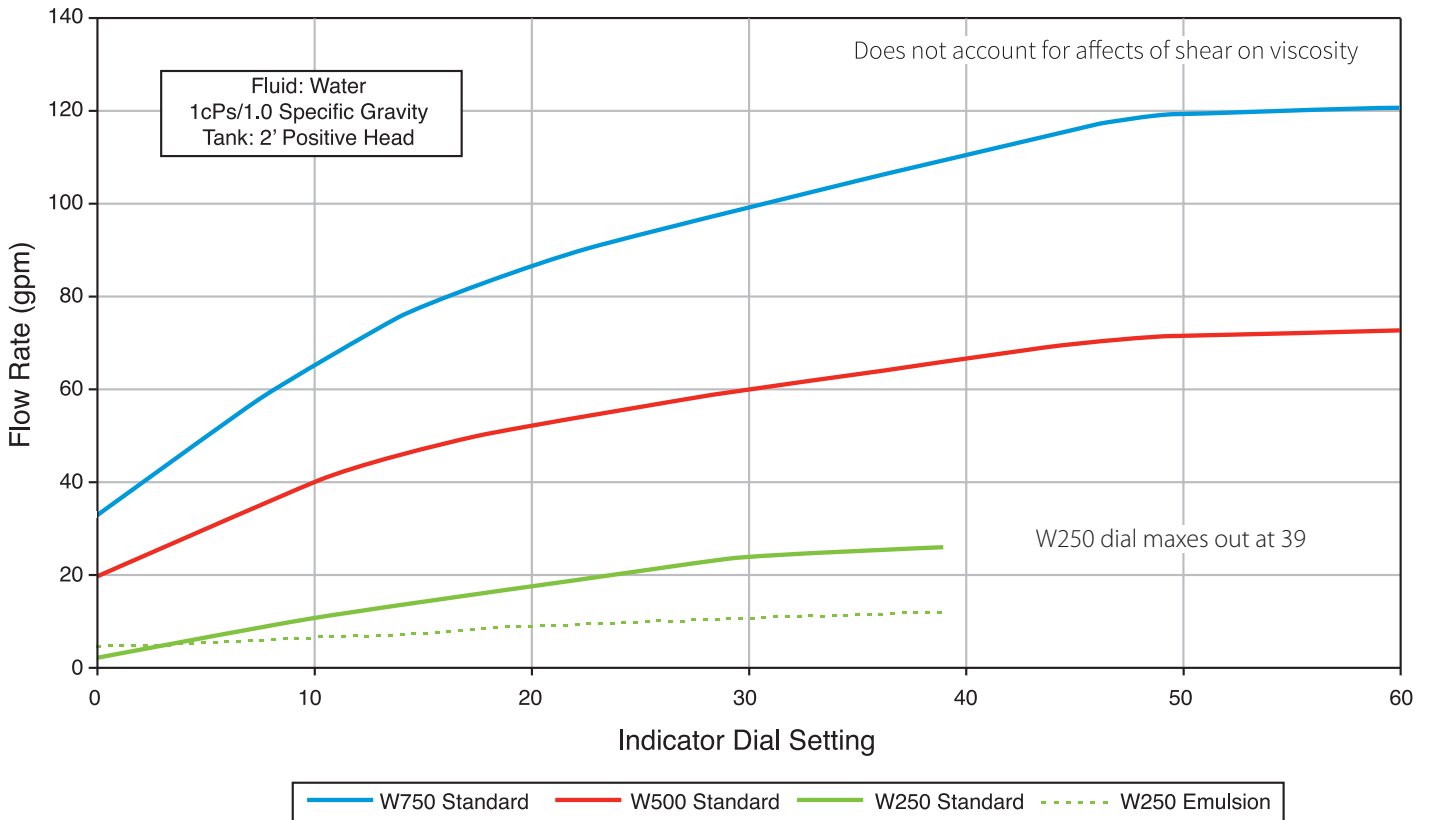
- 316 SS wetted parts impregnated with Stellite® for high wear resistance
- Jacketed stator housing with SS connections
- Lip seal shaft sealing
- Explosion proof motors
- Painted base and supports
- Viton® elastomers
- Sanitary, tri-clamp connections

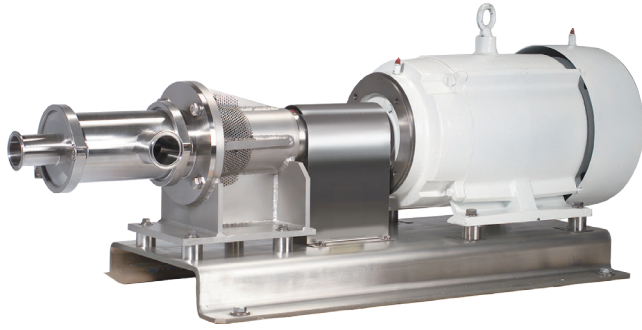
Optional Features

- Alternate rotor-stator design
- Mechanical seals
- 440 hardened SS rotor-stator
- Alternate motor enclosures
- Sanitary all stainless steel supports and base
- Push cart with casters for mobility
- Macerating knife



Flow Rate vs. Gap Setting—Horizontal Colloid Mills





Continuous Flow Inline High Shear Mixers

Mixing Mechanism

- Versatile body design allows for the use of either a single rotor-stator or tandem rotor-stators to meet desired process results
- High speed turbine running in close proximity to a fixed stator creates intense hydraulic and shear forces
- Tightly held tolerances on machined components allow for consistent and predictable performance

Applications

- Solids Incorporation
- Homogeneous Dispersions
- Solids Deagglomeration
- Rapid Blending
- Particle Size Reduction
- Prepackaging Product Refinement

Reliability

The Greeco Pipeline mixer is engineered and proven to provide many years of dependable service. The design exceeds the high quality standards necessary to achieve optimal process results and withstand the rigors of difficult processes that require high shear mixing.

- Available in industrial and sanitary models
- Single or multi-stage heads for process customization
- The robust stator design handles severe duty better than competitive designs that utilize screen technology
- The axial in-axial out flow path results in higher throughputs with lower horsepower requirements
- The entire process stream is directed through the mixing head, eliminating any chance of bypassing the shear zone
- With over six decades of successful installations, the Pipeline mixer has earned its reputation as an excellent solution for high shear applications

Cost Effective Solution

Low Horsepower

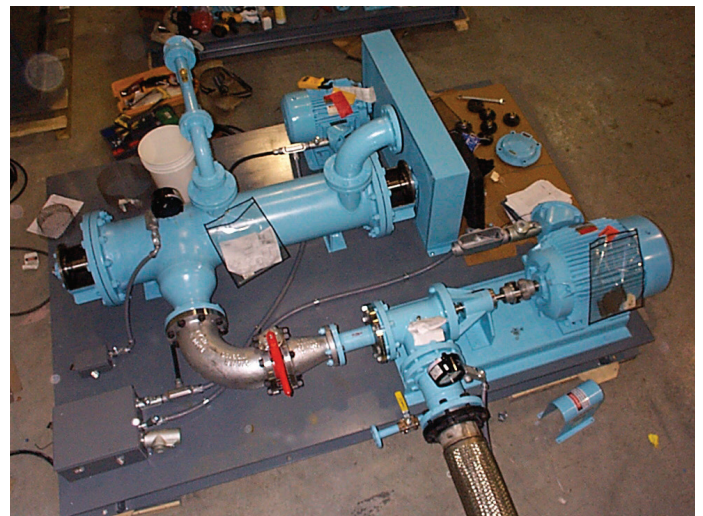
Reduces initial investment and energy consumption

High Throughput

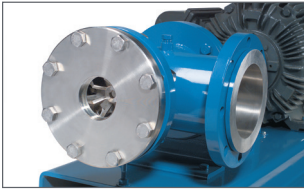
Faster processing rates improve productivity

Robust Design

Minimal downtime and maintenance costs

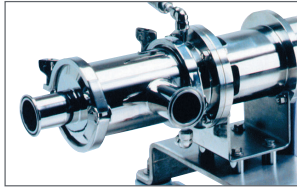


Greeco Pipeline mixers can easily be placed into an existing system to increase efficiency



Industrial Model

- 316SS wetted parts
- Stellite® bushings
- Single mechanical seal
- Explosion proof motors
- Painted base, guard and supports
- NPT inlet with flanged outlet



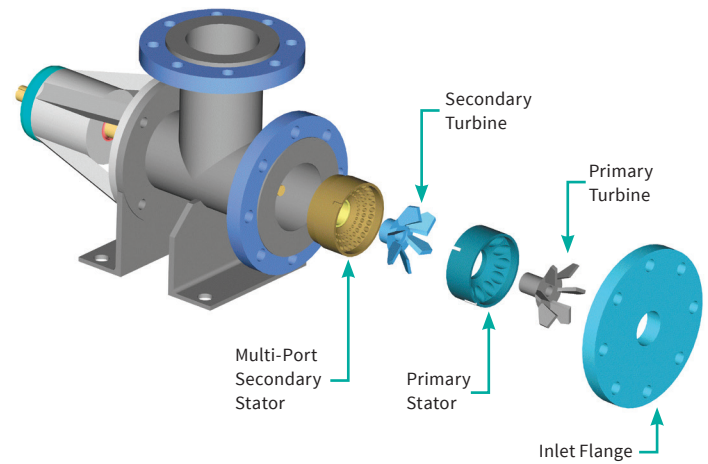
Sanitary Model

- 316SS wetted parts
- FDA Teflon stator bushing
- Sanitary, tri-clamp connections
- Single mechanical seal
- Easy clean, washdown motors
- 304SS base, guard and supports

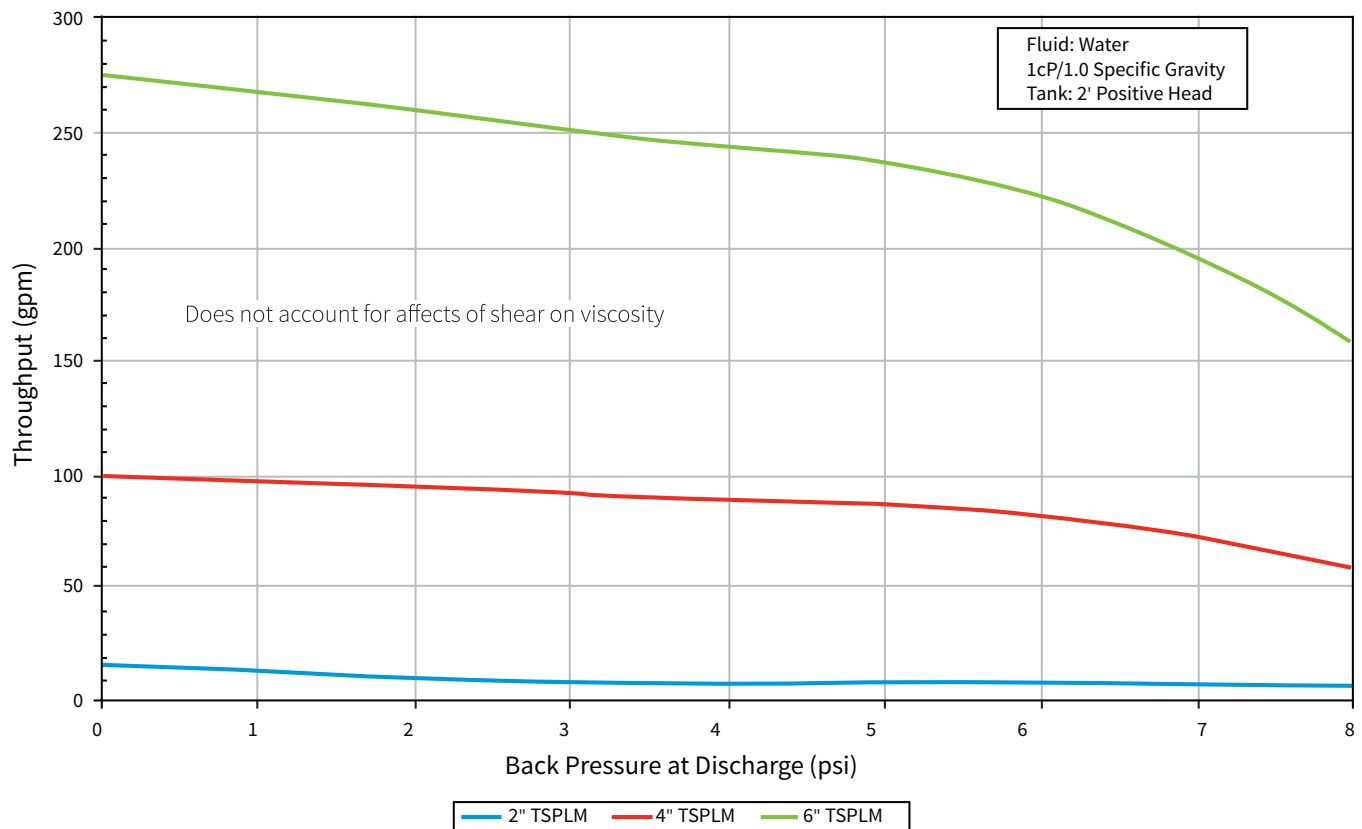
Optional Features

- Alternate stators
- Double mechanical seal
- 440 hardened SS rotor-stator
- Alternate motor enclosures
- Push cart with casters for mobility
- Jacketed body
- Alternate seals and seal faces

Standard Tandem Shear Configuration



Tandem Shear Pipeline Mixer Throughputs





Batch or Continuous Flow Tank Mounted High Shear Mixers

Reliability

The Greerco Homogenizer series offers a full range of tank mounted, high shear mixers from laboratory to production scale. The design exceeds the high quality standards necessary to achieve optimal process results and withstand the rigors of difficult processes that require high shear mixing.

- High speed turbine running in close proximity to a fixed stator creates intense hydraulic and shear forces where the product is broken down into its primary particle size or dispersed throughout the carrier phase
- Tightly held tolerances on machined components allow for consistent and predictable performance
- The robust stator design handles severe duty better than competitive designs that utilize screen technology
- The axial in-axial out flow path results in higher throughputs with lower horsepower requirements

Greerco Processing Advantages

Vs. Traditional Agitator Impeller Systems

The Homogenizer offers operating speeds and shear rates not available in traditional impeller systems. This allows our Homogenizer to dramatically reduce process times for difficult applications as well as complete complex operations where standard impeller technology is not an option (see application section for examples).

Vs. Alternate High Shear Mixing

Head Designs

The unique axial in-axial out flow pattern of our rotor-stator design allows for reversible operation. When operated in the forward direction, the Homogenizer creates an up pumping umbrella flow pattern as opposed to the localized radial-out pattern offered by competitive technology. In the reverse direction, a vortex is created that can be used to incorporate solids directly into the mixing head for immediate dispersion.

Cost Effective Solution

Low Horsepower

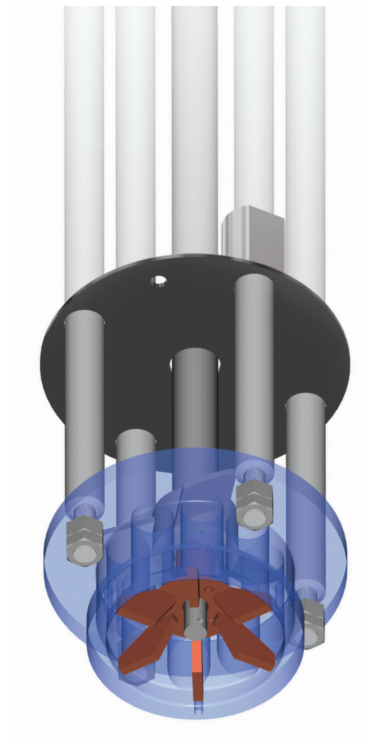
Reduces initial investment and energy consumption

High Throughput

Faster processing rates improve productivity

Robust Design

Minimal downtime and maintenance costs



Applications

- Solids Incorporation
- Homogeneous Dispersions
- Solids Deagglomeration
- Rapid Blending
- Particle Size Reduction
- Prepackaging Product Refinement

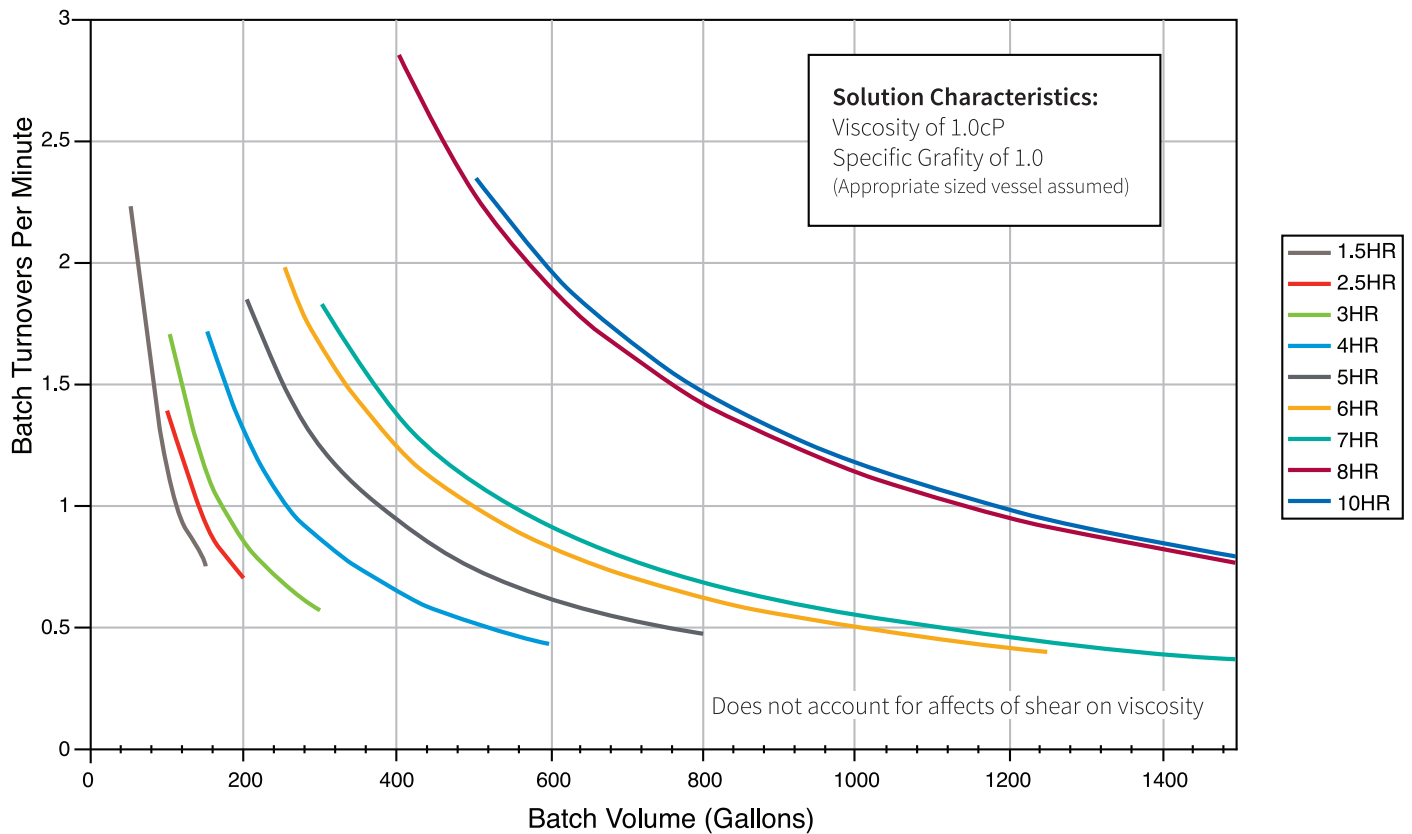
Standard Features

- 316SS wetted parts
- Stellite® bushings
- Lip seal shaft sealing
- Explosion proof motors
- Reversible operation
- SS cross supports

Optional Features

- Flange mounted units
- Double mechanical seal
- 440 hardened SS rotor-stator
- Alternate motor enclosures
- Polished wetted components

Greerco Homogenizer Tank Turnover



Chemineer

Chemineer is a leading provider of process solutions for the oil and gas industry.

Our products and services are designed to improve efficiency and reduce costs.

For more information, please contact your local sales office.

Visit our website at www.nov.com for more details.

Chemineer is committed to providing the highest quality products and services.

Our dedication to customer service is our top priority.

Thank you for choosing Chemineer.

© 2015 National Oilwell Varco | All Rights Reserved

Bulletin 124 Rev 01

Chemineer is a leading provider of process solutions for the oil and gas industry.

Our products and services are designed to improve efficiency and reduce costs.

For more information, please contact your local sales office.

Visit our website at www.nov.com for more details.

Chemineer is committed to providing the highest quality products and services.

Our dedication to customer service is our top priority.

Thank you for choosing Chemineer.

© 2015 National Oilwell Varco | All Rights Reserved

Bulletin 124 Rev 01

Chemineer is a leading provider of process solutions for the oil and gas industry.

Our products and services are designed to improve efficiency and reduce costs.

For more information, please contact your local sales office.

Visit our website at www.nov.com for more details.

Chemineer is committed to providing the highest quality products and services.

Our dedication to customer service is our top priority.

Thank you for choosing Chemineer.

© 2015 National Oilwell Varco | All Rights Reserved

Bulletin 124 Rev 01

Chemineer is a leading provider of process solutions for the oil and gas industry.

Our products and services are designed to improve efficiency and reduce costs.

For more information, please contact your local sales office.

Visit our website at www.nov.com for more details.

Chemineer is committed to providing the highest quality products and services.

Our dedication to customer service is our top priority.

Thank you for choosing Chemineer.

© 2015 National Oilwell Varco | All Rights Reserved

Bulletin 124 Rev 01

Manufacturing Facilities

US

+1 937 454 3200
chemineer@nov.com

United Kingdom

+44 1332 363 175
chemineeruk@nov.com

China

+86 21 6124 0001
chemineercn@nov.com

Sales Facilities

US Ohio

+1 937 454 3200
chemineer@nov.com

United Kingdom

+44 1332 363 175
chemineeruk@nov.com

China

+86 21 6124 0001
chemineercn@nov.com

Singapore

+65 6271 1121
chemineeruk@nov.com

Mexico

+52 55 3300 5370
chemineerventasmx@nov.com

Austria

+43 1 8923481
chemineeruk@nov.com

National Oilwell Varco has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, National Oilwell Varco in no way assumes responsibility for liability for any loss, damage or injury resulting from the use of information and data herein. All applications for the material described are at the user's risk and are the user's responsibility.

Corporate Headquarters

7909 Parkwood Circle Drive
Houston, Texas 77036
USA

