Chemineer™ MR Agitators



Reliability, Performance and Value

The MR agitator's gearbox is a proprietary, parallel shaft, helical gear design that features minimum 30,000 hour L-10 bearing life and an oversized output shaft for optimal performance and extended service life. Shaft speed selections are available from 7 to 380 rpm without the use of auxiliary reducers or electronic drives. When the MR gearbox is expertly matched with a wide variety of Chemineer impellers and other system components, MR agitators are capable of economically meeting your blending, dispersion, and other mixing needs.



Gearbox proprietry internals for optimum service life

Gearbox Designed for Agitator Duty

Commercially available gearboxes for agitators in this size range normally have low speed output shafts and bearing designs that are poorly suited to agitator duty. Commercial gearboxes typically use smaller diameter output shafts, resulting in the need to select larger and more expensive units to handle the torsional loads and bending moments produced by the hydraulic loads on agitator systems. These smaller output shafts and less robust bearing designs of commercial gearboxes also contribute to higher gear deflections, excessive vibration, higher maintenance costs, and a reduced life of many

critical agitator system components. The MR gearbox addresses these concerns by incorporating a larger output shaft straightened to exact tolerances and high capacity tapered roller bearings into its design. The rugged cast iron housing of the MR gearbox features a double lip seal to effectively contain the gearbox lubricant as well as a swing out seal change design that saves maintenance labor and reduces downtime. These design features reduce the overall initial cost of the gearbox and other agitation system components and reduce the maintenance costs of the agitator.

Versatile Modular Design

The modular design of MR agitators makes them well suited for a variety of mixing applications. MR agitators are designed to meet AGMA, OSHA, ANSI, IEC, DIN, EU and ATEX standards and requirements. They may be supplied with integral gearmotors, standard NEMA and IEC motors or explosion proof motors. A variety of stuffing boxes or mechanical seals and many custom pedestals, couplings, impellers, shafts, and steady bearings can be incorporated into the MR design as well. This product can be mounted to support

beams or similar structures for open tank operation or to pedestals, plates or flanges for closed tank operation. The MR agitator and all of its system components are included in the Chemineer Expert Design System (CEDS), the industry leading agitator design and analysis software program. CEDS helps insure that MR components are selected and configured for optimal system performance and value.



Global Availability

To support the global manufacturing footprint of our customers, MR agitators are available in all major global markets. MR agitator gearboxes, mountings and system components are also interchangeable with the Chemineer Model 20 HT and GT agitators enabling customers to readily adapt or upgrade their agitator drives

and system components to changes in application requirements or operating environments.

With all of its versatility, MR agitators can become your global process system standard helping drive efficiencies in procurement and reduce maintenance costs and replacement part investment.

Impeller Technology

Chemineer impeller technology is effectively applied across your spectrum of applications ensuring successful, repeatable results from lab scale to full scale operations.

Our mixing expertise includes high flow, low shear liquid-liquid agitation, solids suspension, gas dispersion, high shear blending and

viscous mixing. Whether it is R&D or production phase, we have the expertise to solve your mixing challenges.

An impeller bulletin is available with additional information.



Features and Benefits

Features Benefits

Internal Shafting	Oversized low speed shaft diameter and short bearing span reduce deflection and gear misalignment	Extends seal and bearing life Lowers initial costs Lowers maintenance costs	
Gearing	Double and triple reduction gearing for low gear loading and quiet operation	Smooth operation Long service life	
	Helical gearing	• Lowers energy costs	
	Bath lubrication ensures adequate lubrication to gears and bearings at all operating speeds	Lowers initial costs Eliminates need for internal/external lubrication pumps	
Gearbox Lubrication	Standard R&O oils and greases	Lowers installation and maintenance costs	
	• Double lip seal	Lowers capital cost Maintains process fluid integrity	
Bearing Design	Output shaft features tapered roller bearings and a short bearing span that provides greater capacity to handle bending and thrust loads	Extends service life Lowers maintenance costs	
	Ball bearings, oil lubricated	• Ensures cool operation and low maintenance	

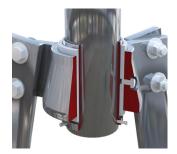
In-Tank Coupling and Steady Bearing Options



Welded Coupling



Removable Coupling



Tripod Steady Bearing



Bracket Steady Bearing



Features and Benefits

Benefits

	reatures	Delients
	Drop collar shaft support during seal change	Shaft drops easily by loosening coupling bolts, and engages by tightening the coupling bolts Shaft only drops 0.5" eliminating steady bearing disengagement
	Optional throttle bushing and debris well design	Clean fluid flush eliminates process build up in seal area improving seal life Eliminates particle shedding from entering tank
Souls	Swing out seal change design	No need to pull shaft up through gearbox or in-tank shaft supports No labor or parts required for special shaft support system No lifting and removing of gearbox, saving labor and downtime
Seals	Variety of seal options from major mechanical seal vendors such as John Crane, Flowserve, Chesterton and AES	Cartridge double and single seals, low pressure single seals, and cartridge ChemSeals provide performance and flexibility to meet agitator sealing needs
	Low height pedestal design reduces shaft deflection at the seal	Extends service life Minimizes downtime
	Optional seal shut off device	Eliminates operator exposure to hazardous vapors without draining the vessel
	Optional lip seals and stuffing boxes	Value lip seals for low pressure applications Self lubricating packing offers low maintenance sealing options for pressures up to 100 psi









Swing out seal change

ChemSeal

Dimensions for 11–16 MR

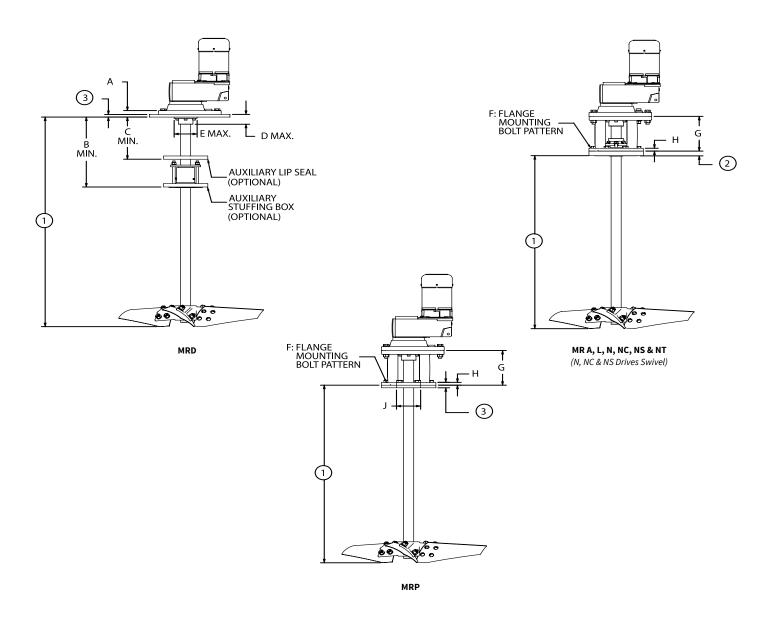
Agitator Dimensions

Bolt Pattern

Case Size	A	В	С	D	E	F [©]		н	J	Seal/Mount Type
11MR	1.12"	16.00"	8.00"	2.81"	5.71"	O" 150# ANCI /balas straddla contar lina)	10.00"	0.75"	9.50"	All
12MR	1.12	16.00" 8.00"	8.00	2.81	5.71"	8" — 150# ANSI (holes straddle center line)	10.00	0.75	9.50	All
13MR	1 5011	20.00"	0.00"	4.00"	7 40!!	10" — 150# ANSI (holes on center line)	12 50"	0.00!	10.00"	
14MR	1.50"	20.00" 8.00" 4.0	4.00	7.48"	10 — 150# ANSI (Hotes on Center tine)	12.50"	0.88"	10.00"	All	
15MR	1 5011	10.62"	0.621	4.63"	9.45"	13" 150" ANGL/I	14.06"	1.18"	10.83"	All
16MR	1.59"	" 18.63" 8.63"		4.63	9.45	12" — 150# ANSI (holes straddle center line)	14.06"	1.10	10.83	All

Dimensions are for reference only. See assembly drawing.

- 1 Agitator output speed, shaft diameter and extension, impeller design and other features not shown built to suit application.
- 2 Alternate flange sizes are available.
- ${\bf 3}\ \ {\bf Both\ the\ D\ and\ P\ style\ agitators\ come\ with\ a\ steel\ base\ plate\ as\ an\ option.\ See\ IOM\ for\ base\ plate\ dimensions.$
- ${\color{red} \textbf{4} \ These \ dimensions \ are \ only \ approximations, \ and \ may \ vary \ slightly \ depending \ on \ the \ motor \ options \ and \ the \ motor \ supplier \ chosen.}$





Dimensions for 17 and 18 MR

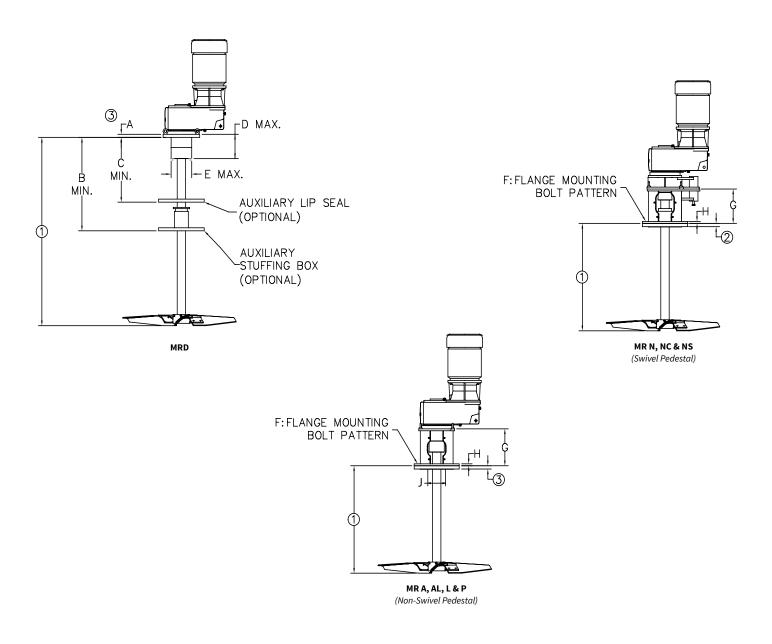
Agitator Dimensions

Bolt Pattern

Case Siz	e A	В	С	D	E	F [©]	G	н	J	Seal/Mount Type
							16.88"			D, N, NC, NS
17MR	1.50"	27.00"	16.00"	11.95"	5.71"	16" — 150# ANSI (holes straddle center line)	20.25"	0.94"	14.57"	AL, L, P
							24.56"			A
							16.88"			D, N, NC, NS
18MR	1.75"	28.00"	17.00"	13.97"	7.48"	16" — 150# ANSI (holes straddle center line)	22.00"	0.94"	14.57"	AL, L, P
							26.06"			A

Dimensions are for reference only. See assembly drawing.

- 1 Agitator output speed, shaft diameter and extension, impeller design and other features not shown built to suit application.
- 2 Alternate flange sizes are available.
- ${\bf 3}\ \ {\bf Both\ the\ D\ and\ P\ style\ agitators\ come\ with\ a\ steel\ base\ plate\ as\ an\ option.\ See\ IOM\ for\ base\ plate\ dimensions.$
- 4 These dimensions are only approximations, and may vary slightly depending on the motor options and the motor supplier chosen.



Dimensions for 11 and 12 MR

Swivel Dimensions

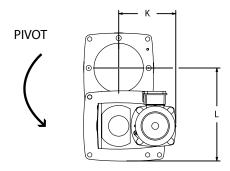
Case Size	K [⊕]	L
11MR	9.72"	17.57"
12MR	11.04"	17.57

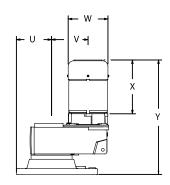
Typical Drive Assembly Swivel Dimensions

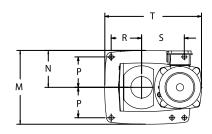
Drive assembly pivots at top of pedestal to allow change out of mechanical seals. See IOM for special motor conduit instructions.

Motor Dimensions

F		w®	x [®]	γ.	
Frame Siz	e	w⊎	X.	11MR	12MR
	56C	7.75"	13.11"	25.75"	26.84"
	140TC	7.75"	13.11"	25.75"	26.84"
NEMA	180TC	9.25"	16.24"	30.03"	31.97"
	210TC	11.00"	17.96"	_	33.69"
NEMA	250TC	12.75"	22.25"	_	_
	280TC	14.50"	24.24"	_	_
	320TC	16.88"	27.00"	_	_
	360TC	18.50"	27.63"	_	_
	71	5.69"	9.25"	20.85"	21.84"
	80	6.61"	10.66"	23.05"	24.04"
	90	7.40"	11.18"	23.57"	24.56"
	100	7.72"	13.15"	26.21"	27.20"
	112	9.45"	13.03"	26.09"	27.08"
	132	10.16"	16.73"	_	32.00"
IEC	160	12.52"	21.26"	_	_
	180	14.37"	23.31"	_	_
	200	15.67"	27.09"	_	_
	225	17.64"	30.51"	<u> </u>	_
	250	20.00"	35.04"	_	_
	280	22.17"	38.39"	_	_
	315	26.05"	50.28"	_	_
	71	5.43"	9.06"	17.20"	18.18"
	80	6.14"	10.04"	18.18"	19.17"
	90	6.92"	11.65"	19.79"	20.78"
	100	7.63"	12.84"	20.98"	21.96"
	112	8.58"	13.74"	21.88"	22.87"
	132	10.16"	17.12"	_	26.25"
	160M/LMH	12.60"	18.86"		_
	160LH	12.60"	20.42"	_	_
	180MX/LX	12.60"	20.42"	_	_
Integral	180MH/LH	14.09"	24.52"	_	_
8	200/225S/M	15.67"	27.15"	_	
	225SH/MH	17.52"	27.03"	_	_
	250M	19.49"	30.55"	_	_
	250MH	19.49"	33.31"	_	_
	280S/SH	22.64"	34.69"	_	_
	2803/311 280M			_	_
	280MH		1_	_	
	315S/SH			_	_
	315Ma/Mha	_			







Case Size	м	N	P	R	S	T [®]	U	V
11MR	13.50"	6.75"	F FC"	F FC"	7.01"	16.47"	6.75"	5.79"
12MR		6.75"	5.56"	5.56"	7.81"	17.79"	6.75"	7.01"



Dimensions for 13 and 14 MR

Swivel Dimensions

Case Size	K [®]	L
13MR	13.03"	22.61"
14MR	15.02"	22.61"

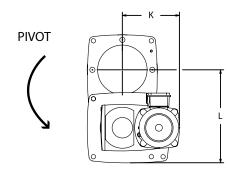
Typical Drive Assembly Swivel Dimensions

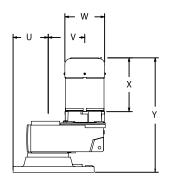
Drive assembly pivots at top of pedestal to allow change out of mechanical seals. See IOM for special motor conduit instructions.

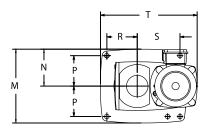
Motor Dimensions

-		w [®]	x @	Y [®]			
Frame Siz	e	₩®	X®	13MR	14MR		
	56C	7.75"	13.11"	28.78"	29.78"		
	140TC	7.75"	13.11"	28.78"	29.79"		
	180TC	9.25"	16.24"	35.51"	36.51"		
	210TC	11.00"	17.96"	37.23"	38.23"		
NEMA	250TC	12.75"	22.25"	41.52"	42.53"		
	280TC	14.50"	24.24"	_	45.15"		
	320TC	16.88"	27.00"	_	_		
	360TC	18.50"	27.63"	_	_		
	71	5.69"	9.25"	_	_		
	80	6.61"	10.66"	_	_		
	90	7.40"	11.18"	26.84"	27.85"		
	100	7.72"	13.15"	29.76"	30.77"		
	112	9.45"	13.03"	29.64"	30.65"		
	132	10.16"	16.73"	35.58"	36.59"		
IEC	160	12.52"	21.26"	40.27"	41.28"		
	180	14.37"	23.31"	57.40"	58.40"		
	200	15.67"	27.09"	_	_		
	225	17.64"	30.51"	_	_		
	250	20.00"	35.04"	_	_		
	280	22.17"	38.39"	_	_		
	315	26.05"	50.28"	_	_		
	71	5.43"	9.06"	_	_		
	80	6.14"	10.04"	_	_		
	90	6.92"	11.65"	22.28"	23.27"		
	100	7.63"	12.84"	23.46"	24.45"		
	112	8.58"	13.74"	24.37"	25.36"		
	132	10.16"	17.12"	27.75"	28.75"		
	160M/LMH	12.60"	18.86"	30.23"	31.23"		
	160LH	12.60"	20.42"	31.81"	32.80"		
	180MX/LX	12.60"	20.42"		32.80"		
Integral	180MH/LH	14.09"	24.52"	_	36.90"		
eg. u.	200/225S/M	15.67"	27.15"	_	_		
	225SH/MH	17.52"	27.03"	_	_		
	250M	19.49"	30.55"	_	_		
	250MH	19.49"	33.31"	_	_		
	280S/SH	22.64"	34.69"		_		
	2803/311 280M	_	34.03		_		
	280MH						
	315S/SH			_	_		
	315Ma/Mha	_					

Dimensions are for reference only. See assembly drawing.







Case Size	М	N	P	R	S	T [®]	U	V
13MR		0.50"	7.06"	7.06"	10.06"	21.53"	0.501	8.11"
14MR	17.00"	8.50"	7.06"	7.06"	10.06"	23.52"	8.50"	9.88"

Dimensions for 15 and 16 MR

Swivel Dimensions

Case Size	K [⊕]	L
15MR	22.17"	28.31"
16MR	23.55"	28.31"

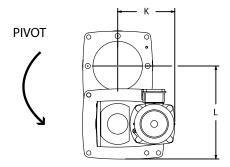
Typical Drive Assembly Swivel Dimensions

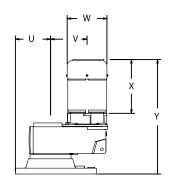
Drive assembly pivots at top of pedestal to allow change out of mechanical seals. See IOM for special motor conduit instructions.

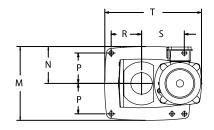
Motor Dimensions

		w [®]	@	Y [®]		
Frame Size		w e	X [®]	15MR	16MR	
NEMA	56C	7.75"	13.11"	34.65"	_	
	140TC	7.75"	13.11"	34.65"	_	
	180TC	9.25"	16.24"	41.38"	41.86"	
	210TC	11.00"	17.96"	47.39"	43.58"	
	250TC	12.75"	22.25"	50.02"	51.76"	
	280TC	14.50"	24.24"	54.59"	53.74"	
	320TC	16.88"	27.00"	58.14"	55.48"	
	360TC	18.50"	27.63"	_	59.03"	
	71	5.69"	9.25"	_	_	
	80	6.61"	10.66"	_	_	
	90	7.40"	11.18"	32.71"	_	
	100	7.72"	13.15"	35.63"	36.28"	
	112	9.45"	13.03"	35.52"	36.16"	
IEC	132	10.16"	16.73"	41.46"	41.83"	
	160	12.52"	21.26"	48.97"	49.86"	
	180	14.37"	23.31"	51.02"	51.91"	
	200	15.67"	27.09"	53.35"	54.24"	
	225	17.64"	30.51"	59.68"	60.57"	
	250	20.00"	35.04"	64.21"	65.10"	
	280	22.17"	38.39"	67.56"	68.45"	
	315	26.05"	50.28"	_	_	
	71	5.43"	9.06"	_	_	
	80	6.14"	10.04"	_	_	
	90	6.92"	11.65"	27.15"	_	
	100	7.63"	12.84"	29.35"	28.54"	
	112	8.58"	13.74"	30.13"	29.32"	
	132	10.16"	17.12"	34.43"	35.30"	
	160M/LMH	12.60"	18.86"	36.12"	36.99"	
	160LH	12.60"	20.42"	37.69"	38.56"	
	180MX/LX	12.60"	20.42"	37.69"	38.56"	
Integral	180MH/LH	14.09"	24.52"	41.00"	41.87"	
	200/225S/M	15.67"	27.15"	44.39"	45.26"	
	225SH/MH	17.52"	27.03"	44.27"	45.14"	
	250M	19.49"	30.55"	-	_	
	250MH	19.49"	33.31"	_	_	
	280S/SH	22.64"	34.69"	_	_	
	280M	_	-	_	_	
	280MH	_	_	_	_	
	315S/SH	_	_		_	
	315Ma/Mha					

 $\label{thm:constraints} \mbox{Dimensions are for reference only. See assembly drawing.}$







Case Size	м	N	P	R	S	T [®]	U	V
15MR	22.05"	11.03" 9.65"	0.6511	7.68"	2.17"	31.42"	9.25"	11.08"
16MR			9.65			32.80"		12.46"



Dimensions for 17 and 18 MR

Swivel Dimensions

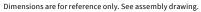
Case Size	K [⊕]	L
17MR	28.78"	27.77"
18MR	31.60"	35.60"

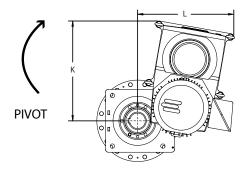
Typical Drive Assembly Swivel Dimensions

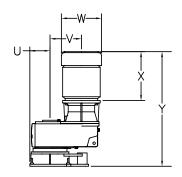
Drive assembly pivots at top of pedestal to allow change out of mechanical seals. See IOM for special motor conduit instructions.

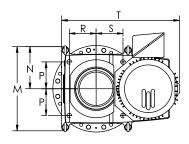
Motor Dimensions

	F	w [®]	x [®]	Y [®]		
	Frame Size	WS	X	17MR	18MR	
NEMA	56C	7.75"	13.11"	_	_	
	140TC	7.75"	13.11"	_	_	
	180TC	9.25"	16.24"	43.73"	45.92"	
	210TC	11.00"	17.96"	45.45"	47.64"	
	250TC	12.75"	22.25"	53.62"	55.81"	
	280TC	14.50"	24.24"	53.61"	57.80"	
	320TC	16.88"	27.00"	57.34"	59.53"	
	360TC	18.50"	27.63"	60.89"	63.08"	
	71	5.69"	9.25"	_	_	
	80	6.61"	10.66"	_	_	
	90	7.40"	11.18"	_	_	
	100	7.72"	13.15"	38.10"	40.33"	
	112	9.45"	13.03"	37.98"	40.21"	
	132	10.16"	16.73"	43.65"	45.88"	
IEC	160	12.52"	21.26"	51.68"	53.91"	
	180	14.37"	23.31"	53.73"	55.96"	
	200	15.67"	27.09"	53.06"	58.29"	
	225	17.64"	30.51"	62.39"	64.62"	
	250	20.00"	35.04"	66.92"	69.15"	
	280	22.17"	38.39"	70.27"	72.50"	
	315	26.05"	50.28"	85.27"	87.50"	
	71	5.43"	9.06"	_	_	
	80	6.14"	10.04"	_	_	
	90	6.92"	11.65"	_	_	
	100	7.63"	12.84"	32.04"	_	
	112	8.58"	13.74"	32.82"	_	
	132	10.16"	17.12"	37.12"	39.31"	
	160M/LMH	12.60"	18.86"	38.81"	41.00"	
	160LH	12.60"	20.42"	40.38"	42.57"	
	180MX/LX	12.60"	20.42"	40.38"	42.57"	
Integral	180MH/LH	14.09"	24.52"	43.69"	45.88"	
	200/225S/M	15.67"	27.15"	47.08"	49.27"	
	225SH/MH	17.52"	27.03"	46.96"	49.15"	
	250M	19.49"	30.55"	50.50"	52.69"	
	250MH	19.49"	33.31"	53.26"	55.45"	
	280S/SH	22.64"	34.69"	54.64"	56.83"	
	280M	-	-	-	55.05"	
	280MH	_	-	_	59.38"	
	315S/SH	_	-	-	60.96"	
	315Ma/Mha	_	_	_	66.47"	









Case Size	М	N	P	R	s	T [@]	U	V
17MR	22.83"	11.42"	7.28"	7.28"	7.28"	31.41"	9.37"	14.17"
18MR	24.80"	12.40"	8.27"	8.27"	8.27"	36.56"	10.35"	18.27"

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

China +86 21 6124 0001

chemineeruk@nov.com

Manufacturing Facilities

+1 937 454 3200

United Kingdom

+44 1332 363 175

chemineer@nov.com

chemineercn@nov.com

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Corporate Headquarters

7909 Parkwood Circle Drive Houston, Texas 77036 USA

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