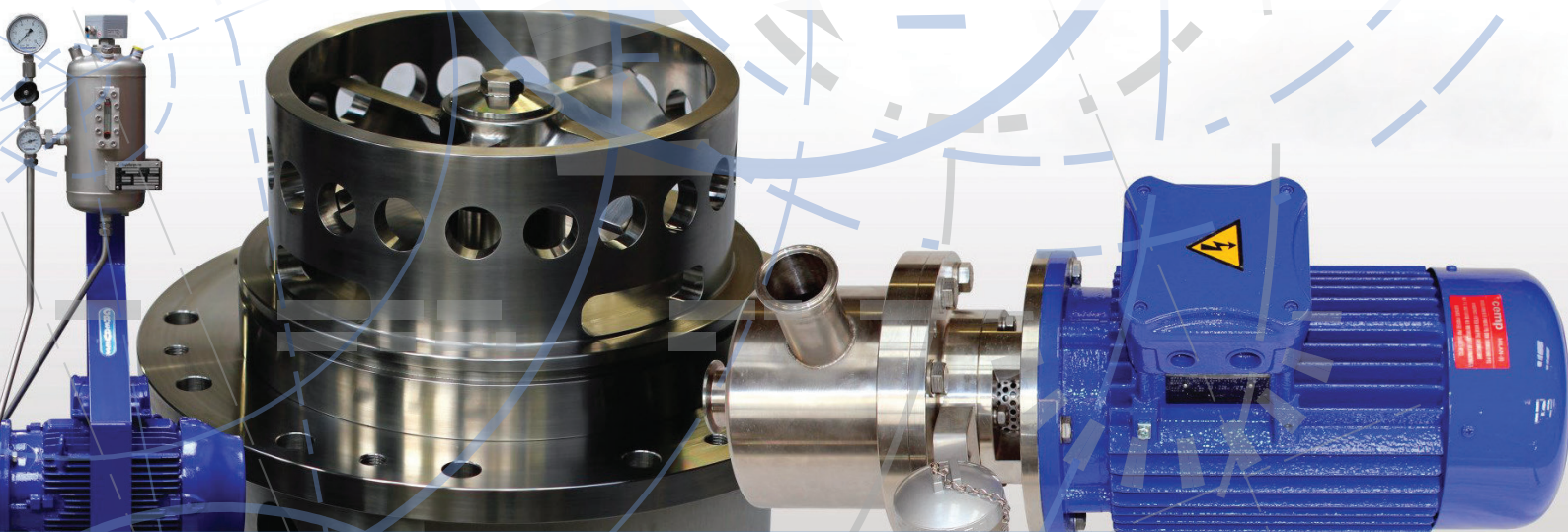


# High Shear, High Speed Mixers for Industrial Mixing applications



# HIGH SHEAR MIXERS

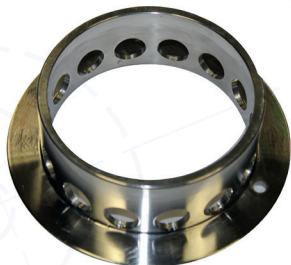
## How does a high shear mixer work?

In a high shear mixer the combination of high speed and close rotor / stator tolerance creates a high energy zone where liquid / liquid and liquid / powder mixtures are rapidly homogenised.

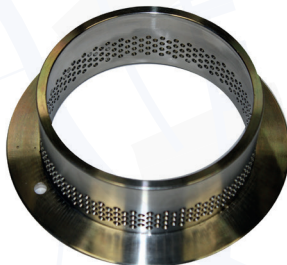
Mixer head design is matched to process requirements in order to achieve optimum particle size and maximise mixing efficiency, whilst minimising aeration.



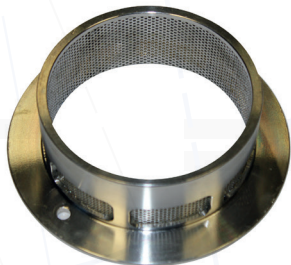
Shear Stator Options



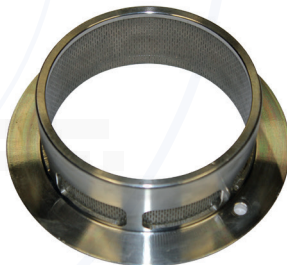
General Purpose Shear Stator



Emulsification Shear Stator



1.5mm Shear Stator



500 micron Shear Stator



## What are the features & benefits of Greaves high shear mixers?

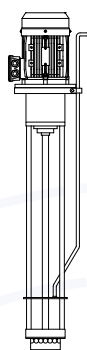
- Scalable from Laboratory to Bulk, delivering consistent results regardless of batch size
- Sector leading rotor / stator gap tolerances, maximising shear rate and minimising batch times
- Alternate head /baffle/impeller options to optimise flow and shear
- Class leading safety features and lifting systems, CE Certificate of Conformity
- ATEX variants to Zone 0 & Zone 20 IIC T4
- De-aeration capability
- Abrasive and corrosive resistant options
- Alternative stator options for particle size down to 3 microns
- In-line and bottom entry variants
- High Pressure & Vacuum shaft sealing options

# TOP ENTRY HIGH SHEAR MIXERS

## Top Entry Mixers

There are two main types of top entry mixer:

1. Stand Mounted Mixer - used with mobile vessels, drums and IBCs. Manual, pneumatic or electro-hydraulic lift options.
2. Fixed Mounted Mixer - mounted directly to the mixing vessel or support bridge.



Top Entry Model	kW	Speed (RPM)	Overall stator diameter	Weight* (Kg)	Capacity** (Litres)
GM-D	0.75	6000	90	30	5-75
GM-E	2.2	4500	123	32	30-200
GM-3	3	3000	162	48	80-500
GM-5	5.5	3000	162	70	100-1000
GM-10	11	3000	232	175	300-1500
GM-15	15	3000	232	225	500-2000
GM-25	22	1500	345	430	2000-5000
GM-50	37	1000	500	1050	4000-10000
GM-60	45	1000	500	1120	5000-15000

\*The Weights should be checked before making a counter-weight / lift.

\*\*The Capacities shown indicate the maximum batch quantity at the maximum viscosity (30,000cps) and minimum viscosities.



## Benefits:

- Flexible, high energy processing of "difficult to mix" formulations
- Creates stable liquid/liquid and liquid/powder mixtures
- Flexible & cost effective
- Easy cleaning, hygienic construction
- Low wear, low maintenance
- Adjustable flow / shear ratio with low aeration
- High Viscosity Capability

## Options:

- Variable Speed with digital display
- Automated lift system (Electric / Pneumatic)
- Full Vacuum de-gassing / Pressure processing
- Product temperature display
- Heated fixed and mobile vessels
- High abrasive variant
- Full PLC process control
- ATEX variants to Zone 0 & Zone 20 IIC T4

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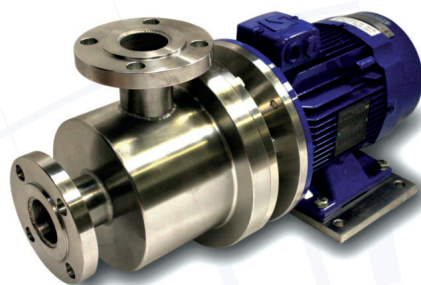
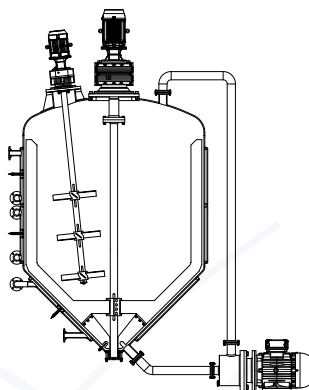


# IN-LINE HIGH SHEAR MIXERS

## In-Line Mixers

In-Line mixers can quickly be added to any mixing vessel outlet. The flow can be recirculated until the required degree of mixing is achieved or alternatively used for single pass homogenisation.

Often used in validated processes across the pharmaceutical, cosmetic and chemical industries with specific shaft sealing options. Favoured due to the flowrate control and definable metrics.



In-line Model	kW	Speed (RPM)	Mechanical Shaft Seal	Fitting Options (mm) DIN, RJT, BSP, SMS, Flanged, IDF or Tri-Clamp	Flowrate (H2O) Litres per min.*
PLMS 1.5 x 2	1.5	3000	Single	38	270
PLMD 1.5 x 2	1.5	3000	Double	38	270
PLMS 2 x 5	5.5	3000	Single	50	559
PLMD 2 x 5	5.5	3000	Double	50	559
PLMS 3 x 15	15	3000	Single	76	1083
PLMD 3 x 15	15	3000	Double	76	1083
PLMS 4 x 30	22	1500	Single	102	1652
PLMD 4 x 30	22	1500	Double	102	1652

\*Note: as the viscosity increases, the flowrate will decrease. Medium to high viscosities will require a suitably sized pump to charge feed the mixer



## Benefits:

- Compact, high energy processing of “difficult to mix” formulations
- Creates stable liquid/liquid and liquid/powder mixtures
- Ease of integration with existing equipment
- Single or multi-pass processing
- Low wear, low maintenance
- High flow with low aeration
- Accurate control of flowrate and volume

## Options:

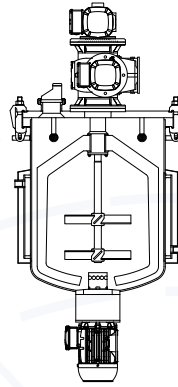
- High abrasive variant
- Thermal head jacket—heating/cooling
- Shaft seal monitoring systems
- High Viscosity Capability
- In-line dosing
- ATEX variants to Zone 0 & Zone 20 IIC T4

# BOTTOM ENTRY HIGH SHEAR MIXERS

## Bottom Entry Mixers

Commonly located at the base of the mixing vessel, bottom entry mixers are often used in combination with other mixing tools, e.g. anchor ribbon mixer. This category of mixers offer the most compact solution where homogenisation or emulsification is required.

The opportunity for hygienic design and limited contact part intrusion, makes this solution particularly suitable for pharmaceutical and food applications.



Bottom Entry Mixer	kW	Speed (RPM)	Mechanical Shaft Seal	Overall stator diameter	Capacity** (Litres)
BES-E	2.2	4500	Single	123	30-200
BED-E	2.2	4500	Double	123	30-200
BES-5	5.5	3000	Single	162	100-1000
BED-5	5.5	3000	Double	162	100-1000
BES-15	15	3000	Single	232	500-2000
BED-15	15	3000	Double	232	500-2000
BES-25	22	1500	Single	345	2000-5000
BED-25	22	1500	Double	345	2000-5000
BES-50	37	1000	Single	500	4000-10000
BED-50	37	1000	Double	500	4000-10000

\*\*The Capacities shown indicate the maximum batch quantity at the maximum viscosity (30,000cps) and minimum viscosities.



### Benefits:

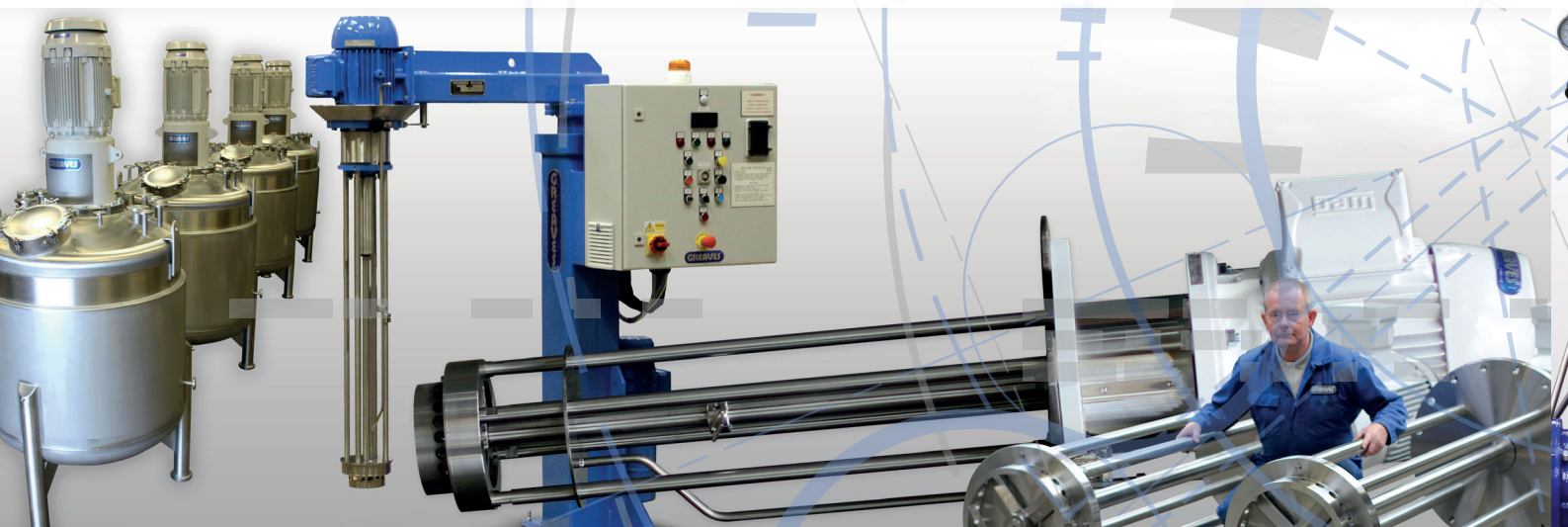
- Compact and effective with batch size flexibility
- Most hygienic high shear mixing solution
- Easy to clean
- Creates stable liquid/liquid and liquid/powder mixtures
- Low wear, low maintenance

### Options:

- High abrasive variant
- Thermal head jacket—heating/cooling
- Shaft seal monitoring systems
- High Viscosity Capability
- In-line dosing
- ATEX variants to Zone 0 & Zone 20 IIC T4



FLUID PROCESSING SOLUTIONS



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