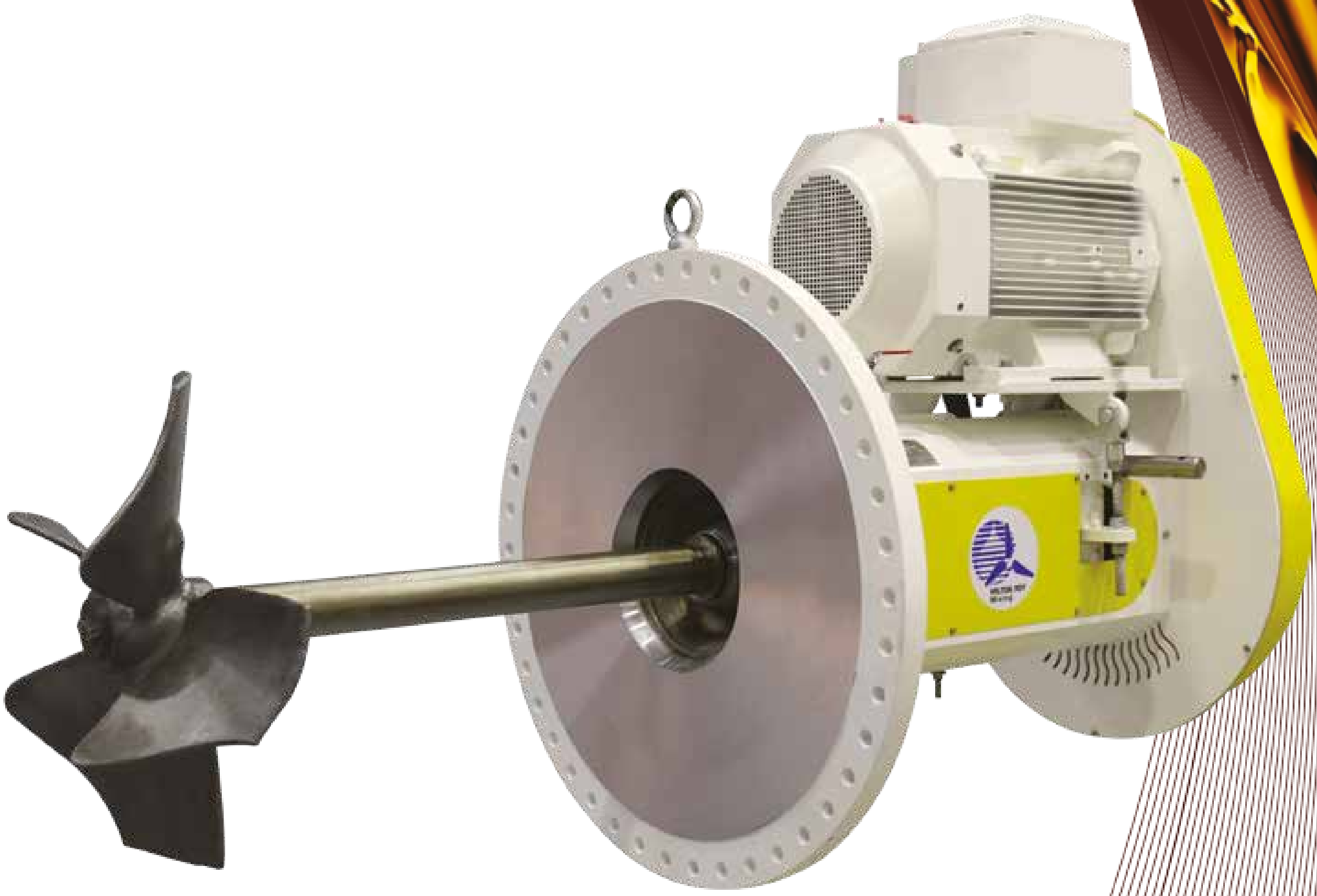
Side Entry Mixers

For all your crude oil & derivatives storage and blending tanks



At the heart of Mixing

Compact. Powerful. Consistent results.

Manage bottom sludge and water, blend crude oil and refined products, and keep tank temperature homogeneous

Side entry mixers provide the most efficient and cost effective means of providing fluid motion for numerous storage tank operations like controlling bottom sludge and water (BS&W), blending, and keeping temperatures uniform in the tank.

Milton Roy Mixing's side entry mixers are unique and offer a variety of features to optimize process performance and reduce maintenance. For large volume storage tanks that require constant mixing of the contents, our mixers deliver the most effective result in an extremely energy efficient unit.

Our side entry mixers mount quickly and easily on the tank flange. Its innovative small diameter SABRE® impeller allows for reduced energy consumption, improved hydraulic efficiency, and easy installation.

The innovative design is driven by four top priorities:

- Safety
- Reliability
- Process optimization
- Easy, cost effective and quick maintenance

Founded in 1895, Milton Roy Mixing is now a global leader in mixing equipment and agitators. Backed by decades of engineering expertise and a highly trained and experienced team, we ensure quality and reliability through every stage in the process: from selection, design and planning to testing, installation and maintenance. Our in-depth knowledge of chemical processes and our dedication leads to products designed for years of reliable service in the most demanding environments.

Applications

Prevention of BS&W in crude oil storage tanks. BS&W are the impurities such as sand, salt and other unwanted contaminants that accompany crude oil when it comes out of the ground. Water is sometimes added to crude oil to allow easier pumping into the pipeline. These impurities are removed in the refining process—but until the crude is delivered to the refinery, BS&W can reduce the capacity of a storage tank by up to 30-percent. Side entry mixers keep fluids in suspension and prevent BS&W from settling on the bottom of the tank, reducing the risk of an expensive and challenging tank cleanup.

Product homogeneity. Side entry mixing technology is used to keep oil of different gravities blended together in the tank and keep the product as homogeneous as possible until it is sent to the refinery.

Temperature uniformity. Bitumen/asphalt producers must ensure that the temperature is uniform in the tank to avoid solidification of the asphalt as areas getting colder.

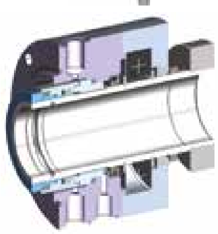
Products

- Crude oil
- Refined by-products
- Bitumen and naphtalene
- Bioethanol and biodiesel
- Lubricant, oil and solvents
- Effluent/water

Innovative features for a superior solution

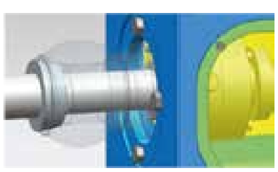
Articulated motor support allows for fast belt and/or motor de-assembly and re-assembly

Belt alignment system and tensioning makes the mixer a fast and reliable system



Spherical roller bearings on belt driven configuration reduces vibrations and deflexion of the shaft. Also, the feature enable easier and reliable maintenance operations.

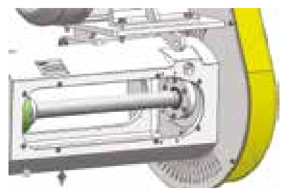
Mechanical seal cartridge with integrated bearing causes less vibration and less runout and allows for a longer seal life



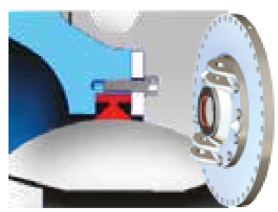
Quick and safe mechanical seal shut off device allows for safe, fast and easy maintenance or replacement of the mechanical seal without emptying the tank. It also features less parts and metal-to-metal sealing.

Screwed and bolted swivel pins provide double security to avoid any oil spilling

Stainless steel parts for quick and easy maintenance and safe, long-term operations. Mixer shaft, ball, mechanical seal, cartridge, hinge pin, bolting, bearing housing.



Large access window in the housing allows easy and safe access to the heart of the mixer during maintenance



Highly resistant engineered polymer ball lip seal provides 100% leak free lip seal system

4 blade SABRE® impeller optimizes agitation even when the product is at its lowest level in the tank and improves energy efficiency by 20% or more - which can be used to reduce operating cost or improve mixing operations. It also has a higher flow velocity, and broader agitated area, while minimizing vibrations. The small diameters enable easy and quick installation.

Benefit Matrix

Each feature was specifically designed to provide numerous benefits.

Feature	Process Optimization	Environmental Protection	Safety	Reliability	Ease of Maintenance	Increased Tank Productivity
Motor support and belt alignment system				•	•	•
Bearing design/mechanical seal		•		•	•	•
Seal shut off device		•	•		•	•
Aerated design			•	•	•	•
Swivel ball seal system		•	•	•	•	•
Stainless steel parts			•	•	•	•
4-blade SABRE® Impeller	•	•	•	•	•	•

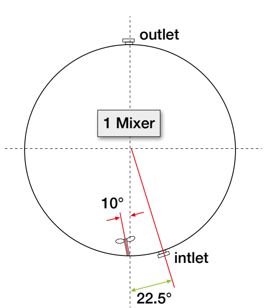
Selection

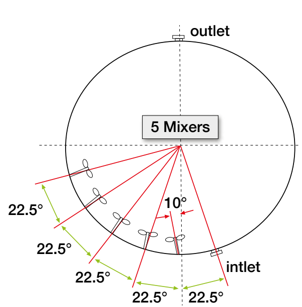
The selection of the mixer is driven by several criteria

- The lowest power consumption for the specified process conditions
- Authorized lowest level in the tank
- Provide the smallest flange as possible

To provide you with the most efficient solution, our experts in computational fluid dynamics (CFD) developed several algorithms taking into account the following criteria:

- Sizing and power calculation
  - Product (SG, Viscosity, special properties)
  - Mixing purpose (BS&W, blending, heat transfer, stratified)
  - Mixing time required
  - Homogeneity required
  - Density difference
- Design
  - Drive configuration (gear / belt)
  - Special requirements (material of construction, critical speed, electrical requirements, etc...)





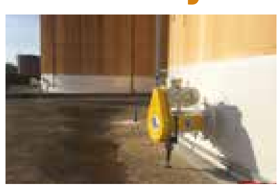
Installation

The orientation of the mixer to tank is key for process performances. The recommended installation for fixed angle mixers is 10° left of center for optimal mixing efficiency, product homogeneity and velocity distribution. Upon request, we can support your installation with CFD analysis.

10° angle: homogeneous and uniform velocity distribution permits excellent BS&W suspension

10° angle: uniform and good velocity distribution

Side Entry Mixer Support Device



Avoid the use of tie rods when installing or replacing mixers. The side entry mixer support device securely stabilizes the mixer during installation. This unique device mounts to the frame and provides a strong hold between the side entry mixer and the ground. By eliminating the use of tie rods installation is quicker and more efficient.

The device can support both fixed and variable angle configurations and gear or belt driven models. It also features an adjustable height, making it flexible for the mixer mounting flange. It is available in coated carbon steel or stainless steel materials.

Technical features

Design Excellence

- Fixed or variable-angle
- 316L ball for variable angle configuration
- High-efficiency 4-blade SABRE® impeller with stainless steel shaft
- Tank shut off device
- Carbon steel construction, single mechanical seal
- Standards ISO 9001, ISO 14001, OHASA, TRCU, ATEX/UL Compliance
- Tie rod for mixer weight above 1540 Lbs/700 Kg

Design Specification	Base Feature	Option (All can be combined)
Operating volume	100 to 200,000 m^3/1.3 MM Barrels	
Power	10 to 75 HP/7.5 to 55 kW	
Frequency	50 Hz/60 Hz	
Transmission	• Belt driven - HTD tooth belt • Gear driven	Eagle “V” Belt
Motor type	• IEC, 400/3/50, TEFC, IP 55, Ins.Cl.F or • NEMA, 460/3/60, TEFC, Ins.Cl.F, Class 2 div 2	• IEC, 440/3/50, IP 55, Ins.Cl.F, ATEX Zone 1 or 2 or • NEMA, 460/3/60, XPFC, Ins.Cl.F, Class 1 div 1
Process temperature	40-480°F/0-250°C	
Bearings	Sealed, greased for life	Regreasable
Propeller	Carbon steel	316L Stainless Steel Duplex steel (1.4462/S32205 or S31803)
Mixing shaft orientation	Variable angle	Fixed angle (with or w/o 10° offset adaptor flange)
Mounting flange	• 16 to 36 inches ANSI flanges • 24-30-36 inches man hole cover	Mixing shaft vertical offset downwards (3” to 9” depending on flange dia)
Mechanical seal	Cartride, Single, Sic/Sic	• Seal leakage detection system per Plan 65 • Mechanical seal for bitumen application • Double mechanical Seal • Associated seal control system Plan 52 or Plan 53 • Mechanical seal as per API 682
Paint	Per SPC2 MR Mixing standard for chemical industries, color RAL 9010	Per SPC5 MR Mixing standard for offshore environments, color RAL 9010
Standards	ISO 9001 ISO 14001 OHSAS TRCU ATEX/UL Compliance CE	

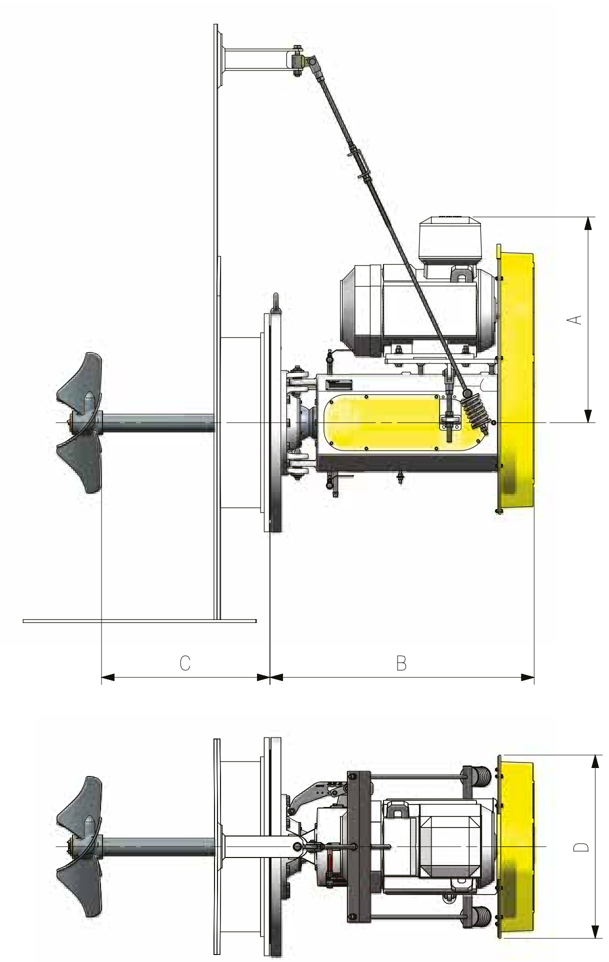
Weight and Dimensions

			FIXED ANGLE (1) (2) (3)										VARIABLE ANGLE (1) (2)									
	Power		A		B		C		D		Weight		A		B		C		D		Weight	
	kW	Hp	mm	in	mm	in	mm	in	mm	in	Kg	Lbs	mm	in	mm	in	mm	in	mm	in	Kg	Lbs
Belt drive	7.5	10	1173	46 3/16	1033	40 11/16	625	24 5/8	711	28	583	1283	1173	46 3/16	1086	42 3/4	750	29 1/2	711	28	623	1371
	11	15	1173	46 3/16	1033	40 11/16	625	24 5/8	711	28	645	1419	1173	46 3/16	1086	42 3/4	750	29 1/2	711	28	685	1507
	15	20	1173	46 3/16	1033	40 11/16	625	24 5/8	711	28	675	1485	1173	46 3/16	1086	42 3/4	750	29 1/2	711	28	715	1573
	18.5	25	1173	46 3/16	1033	40 11/16	625	24 5/8	711	28	715	1573	1173	46 3/16	1086	42 3/4	750	29 1/2	711	28	755	1661
	22	30	1197	47 1/8	1033	40 11/16	625	24 5/8	711	28	732	1610	1197	47 1/8	1086	42 3/4	750	29 1/2	711	28	772	1698
	30	40	1343	52 7/8	1163	45 13/16	625	24 5/8	850	33 7/16	901	1982	1343	52 7/8	1226	48 1/4	750	29 1/2	850	33 7/16	991	2180
	37	50	1377	54 3/16	1163	45 13/16	625	24 5/8	850	33 7/16	1024	2253	1377	54 3/16	1226	48 1/4	825	32 1/2	850	33 7/16	1044	2297
	45	60	1377	54 3/16	1163	45 13/16	650	25 9/16	850	33 7/16	1056	2323	1377	54 3/16	1226	48 1/4	825	32 1/2	850	33 7/16	1076	2367
	55	75	1493	58 3/4	1163	45 13/16	650	25 9/16	850	33 7/16	1114	2451	1493	58 3/4	1226	48 1/4	825	32 1/2	850	33 7/16	1134	2495
Gear drive	7.5	10	1390	54 3/4	1205	47 7/16	700	27 9/16	600	23 5/8	623	1371	1390	54 3/4	1285	50 9/16	825	32 1/2	600	23 5/8	661	1454
	11	15	1390	54 3/4	1205	47 7/16	700	27 9/16	600	23 5/8	685	1507	1390	54 3/4	1285	50 9/16	825	32 1/2	600	23 5/8	723	1591
	15	20	1420	55 7/8	1205	47 7/16	700	27 9/16	600	23 5/8	715	1573	1420	55 7/8	1285	50 9/16	825	32 1/2	600	23 5/8	753	1657
	18.5	25	1490	58 11/16	1205	47 7/16	700	27 9/16	600	23 5/8	755	1661	1490	58 11/16	1285	50 9/16	825	32 1/2	600	23 5/8	793	1745
	22	30	1520	59 13/16	1205	47 7/16	700	27 9/16	600	23 5/8	772	1698	1520	59 13/16	1285	50 9/16	825	32 1/2	600	23 5/8	810	1782
	30	40	1620	63 3/4	1255	49 7/16	700	27 9/16	600	23 5/8	1191	2620	1620	63 3/4	1335	52 9/16	825	32 1/2	600	23 5/8	1241	2730
	37	50	1650	64 15/16	1255	49 7/16	700	27 9/16	600	23 5/8	1224	2693	1650	64 15/16	1335	52 9/16	900	35 7/16	600	23 5/8	1274	2803
	45	60	1690	66 9/16	1255	49 7/16	725	28 9/16	600	23 5/8	1256	2763	1690	66 9/16	1335	52 9/16	900	35 7/16	600	23 5/8	1306	2873
	55	75	1850	72 13/16	1255	49 7/16	725	28 9/16	600	23 5/8	1314	2891	1850	72 13/16	1335	52 9/16	900	35 7/16	600	23 5/8	1364	3001

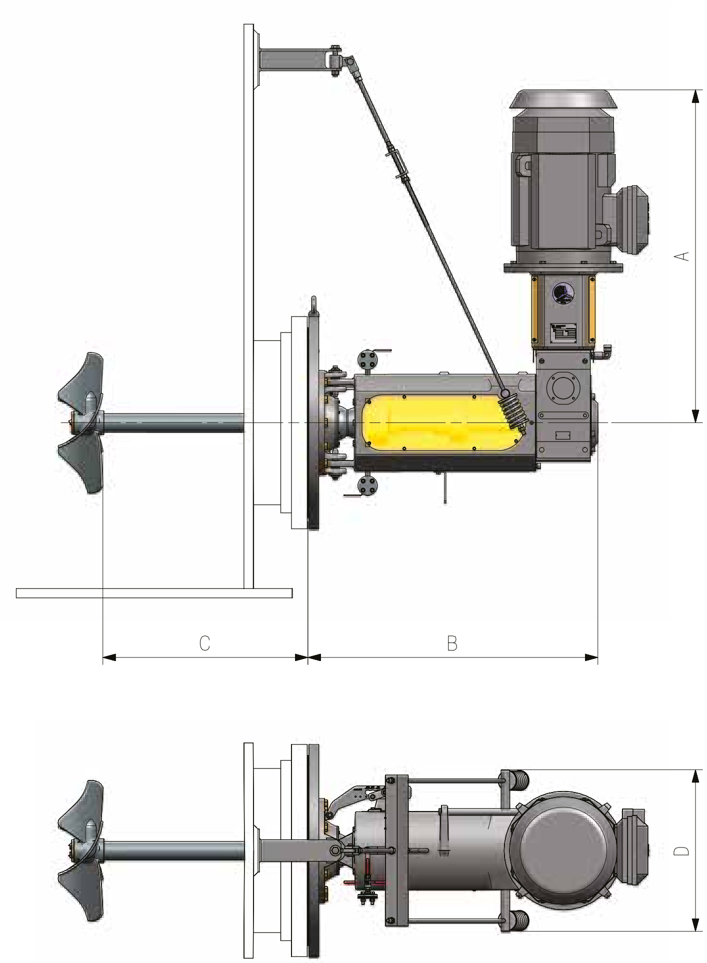
Note (1): The above mentioned information may fluctuate depending on mounting flange diameter and are indicative. Accurate information are provided at quote or order stage.

Note (2) Please consult factory for weight of agitators using XPFC or ATEX motors

Note (3) Includes 10° offset adapter flange dimensions and weight



Belt Drive



Gear Drive

We are a proud member of Accudyne Industries, a leading global provider of precision-engineered, process-critical and technologically advanced flow control systems and industrial compressors. Delivering consistently high levels of performance, we enable customers in the most important industries and harshest environments around the world to accomplish their missions.

Accudyne INDUSTRIES

Worldwide Support

Our products are engineered to address the mixing needs of your process requirements. Our experts are at your disposal to propose the best solution to meet your specific needs. This highly trained staff provides equipment installation, commissioning and training on site. In addition, our after-sales department is available to provide on-site intervention and spare parts.

To learn more about our innovative, energy efficient side entry mixer, contact your local representative or visit our website **www.miltonroymixing.com**

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Literature #59199.01