

EKATO

EKATO AGITATORS FOR STORAGE TANKS

EKATO Side Entry Agitators for Storage Tanks

Reliable solutions for the oil and petrochemical industry



Advanced Process Solutions

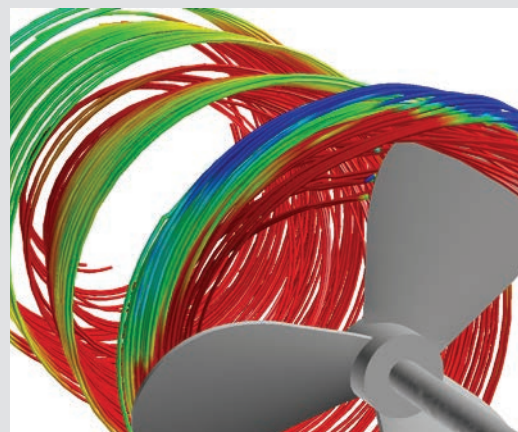
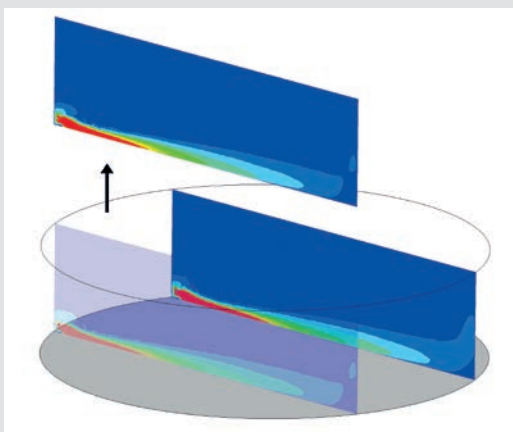


EKATO, the world market leader in mixing technology

In the past 8 decades EKATO has developed to become the world market leader in mixing technology and today offers optimized mixing technologies for the process-oriented industries. EKATO has been family-owned since its founding in 1933 and maintains a worldwide presence with subsidiaries in Europe, Asia, Australia, South America, South Africa and the USA as well as a network of trading partners. The core competence is the development and manufacture of engineered and customized industrial agitators including seals and seal supply systems as well as process plants.

CFD Computational Fluid Dynamics by EKATO

Computational Fluid Dynamics (CFD) visualizes the flow behaviour inside a tank under real conditions. A CFD simulation allows to investigate a three-dimensional flow to define the optimum number and orientation of agitators to be installed in a tank.



EKATO in oil storage tanks

EKATO FLUID side entry agitators are state of the art in design and technology. Reliability, easy maintenance and an economical operation are the main benefits which rely on our experience and know-how in side entry technology.

Side entry agitators for oil storage tanks fulfill the following main duties:

Crude oil - BS&W control:

The mixer generated jet flow lifts the BS&W to prevent the tank bottom from local accumulation and build-up. To reach all areas of the tank bottom properly, swivel angle type agitators are used which can be horizontally varied to max. 30 degrees - on both sides of the tank center line. To keep the tank outlet free from deposit build-up the agitators should be installed in a cluster opposite to the tank outlet.

Blending, maintaining product uniformity, heat transfer:

Under consideration that there are no solids in the tanks, side entry agitators with fixed angle arrangement are used for blending, maintaining product uniformity and heat transfer.



Agitator components

1 Drive

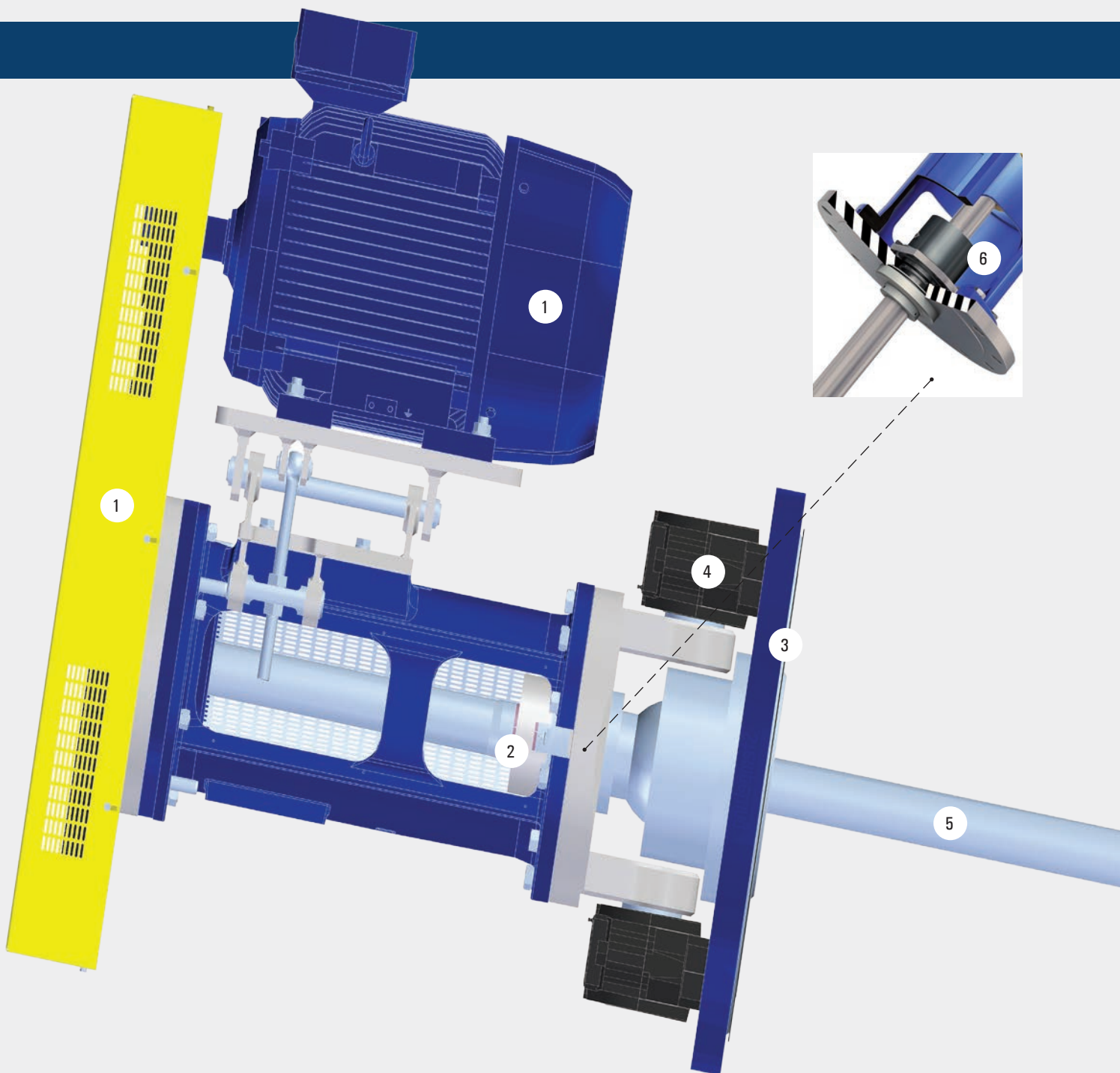
EKATO FLUID side entry agitators are driven by gear or belt. E-motors, following latest IEC or NEMA standards, are applied. Gearboxes of heavy duty design are designed to absorb all occurring loads at specified operating conditions. Toothed-belt drives of antistatic type are fitted with protection covers.

2 Mechanical seal

Single or double-acting EKATO seal of cartridge design including seal supply system in line with API 682, modified for agitators.

3 Mounting flange

Mounting flange connecting dimensions as per ASME B16.47 or ASME B16.5.



4 Swivel device

Swivel angle $\pm 30^\circ$ manual or automatic adjustment / actuation protection cover.

5 Agitator shaft

Solid agitator shaft in one-piece design.

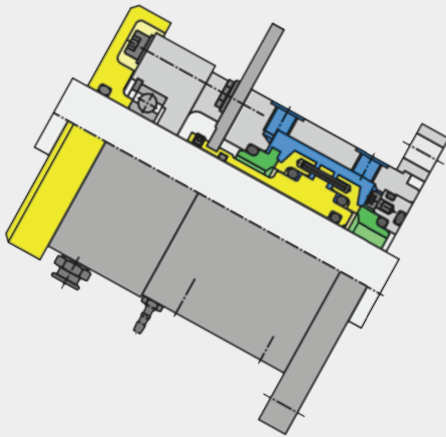
6 Shut-off device

Shut-off for maintenance on mechanical seal while tank is full, with positive locking device (clamping flange).

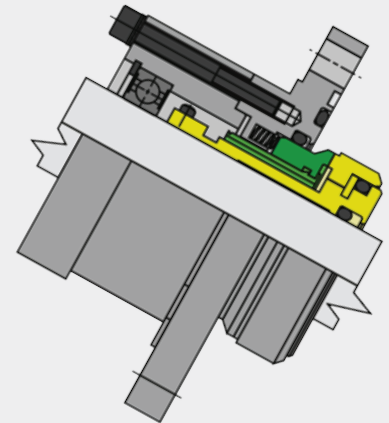
7 Propeller

EKATO propeller in one-piece design (no bolted blades), statically balanced acc. to ISO 1940.

Double-acting mechanical seal type ESD 34N



Single-acting mechanical seal type ESD 142F

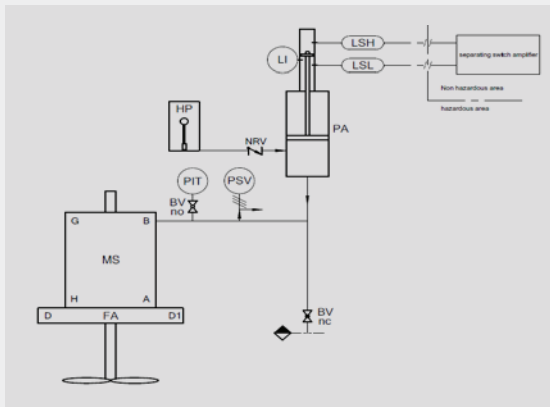
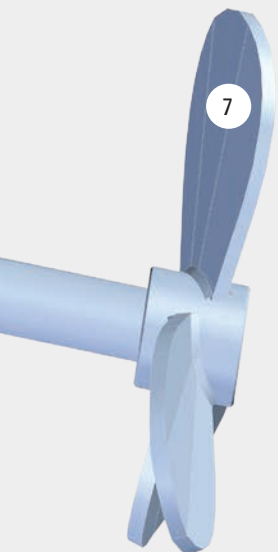


API plan 53 B

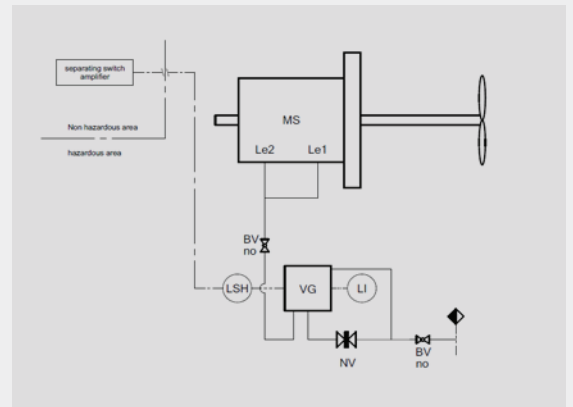
Used for liquid-lubricated double-acting pressurized seals: the external seal liquid will be pressurized by a spring-operated pressure reservoir supplying clean seal oil to the seal chamber. The seal liquid pressure is maintained at a pressure higher than the tank pressure generated by the liquid level.

API plan 65 A

Seal leakage control system: a seal failure will be detected by an excessive flow rate into the leakage collection system.



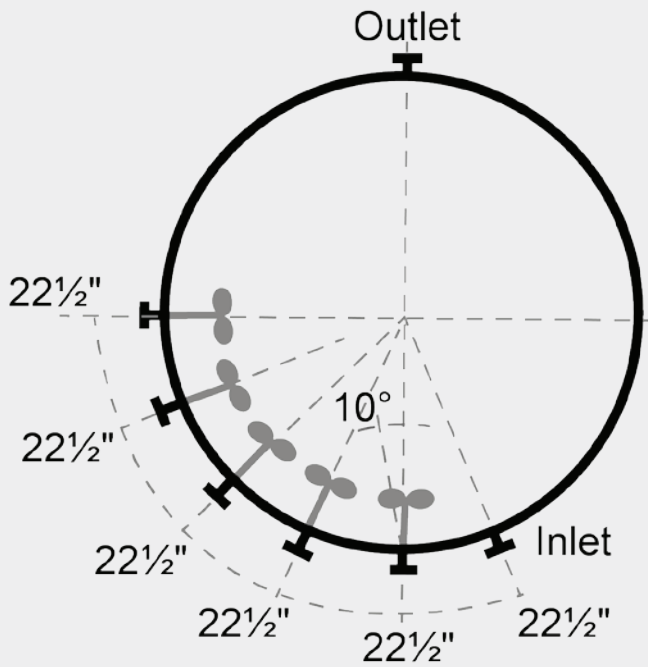
API plan 53 B (modified by EKATO)



API plan 65 A (modified by EKATO)

Agitator arrangement

The proper agitator arrangement at the tank shell is the most critical parameter for a trouble-free tank operation. Jet stream length and pumping capacity determine the required number of agitators per tank. EKATO FLUID side entry agitators are designed for installation and removal from the tank in fully assembled condition.



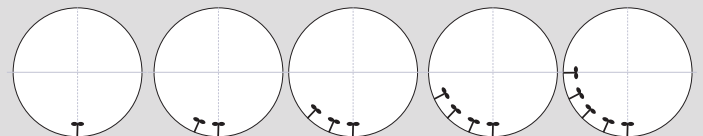
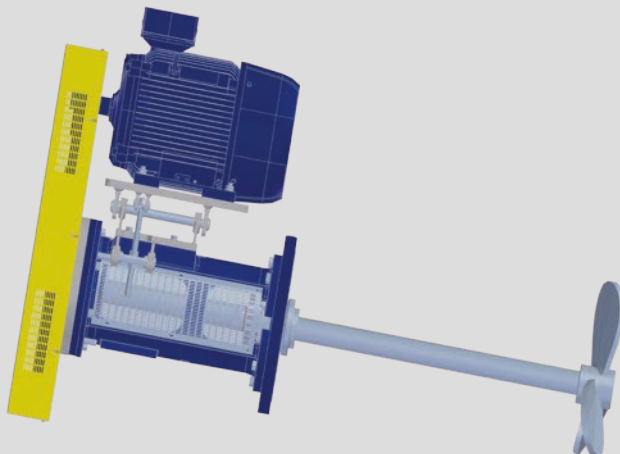
FIXED ANGLE AGITATOR

Gear driven agitator			
Shaft diameter	mm	45	65
Nominal speed *	min-1	365 to 411	315 to 360
Impeller diameter	mm	to suit process conditions	
Length			
Shaft length	mm	800	1000
Lantern / drive height	mm	1000	1200

Belt driven agitator			
Shaft diameter	mm	65	85
Nominal speed *	min-1	410	410
Impeller diameter	mm	to suit process conditions	
Length			
Shaft length	mm	1000	1000
Lantern / drive height	mm	750	800

Dimensions approx. only. Certified drawing after order placement.

* Based on 50 Hz motors



TANK OPENING / MAX. IMPELLER DIAMETER

Manhole / nozzle size	Free opening (mm)	Nozzle length (mm) as per API 650 Dimensions for shell nozzles					
		200	225	250	275	300	325
		Max. impeller diameter (mm)					
ASME 18" / 150	430	510					
ASME 20" / 150	480	600				560	
ASME 24" / 150	580	770	730				
ASME 32" / 150	780	805					

SWIVEL ANGLE AGITATOR

Gear driven agitator

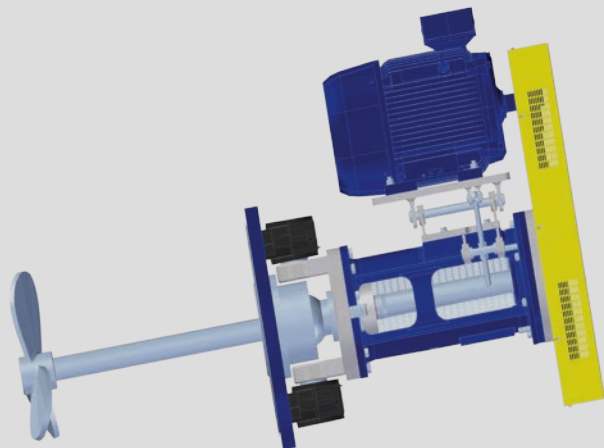
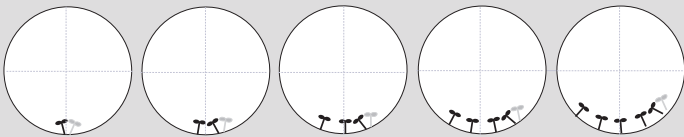
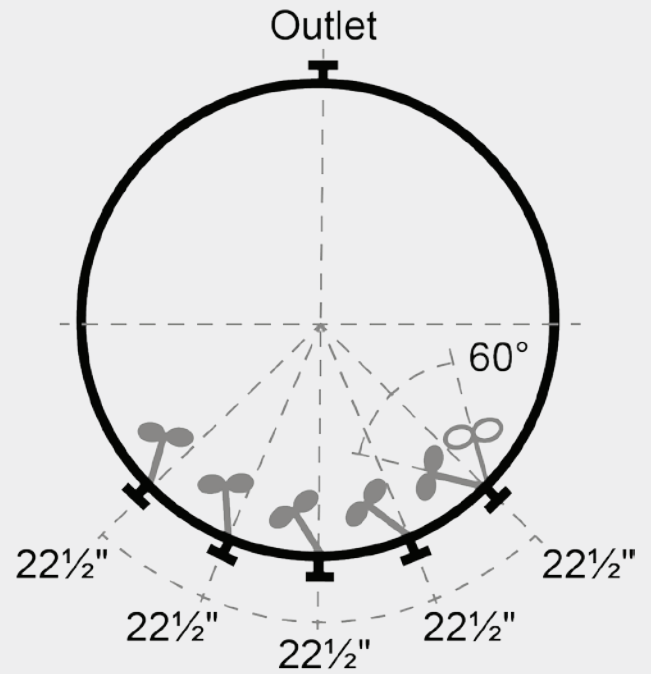
Shaft diameter	mm	45	65
Nominal speed *		365 to 411	315 to 360
Impeller diameter	mm	to suit process conditions	
Length			
Shaft length	mm	800	1000
Lantern / drive height	mm	800	1000

Belt driven agitator

Shaft diameter	mm	65	85
Nominal speed *		410	410
Impeller diameter	mm	to suit process conditions	
Length			
Shaft length	mm	1000	1000
Lantern / drive height	mm	1050	1100

Dimensions approx. only. Certified drawing after order placement.

* Based on 50 Hz motors



EKATO SERVICE provides a broad range of services: „Service on site“, installation and start-up, including instruction and training of the plant operators as well as troubleshooting and availability around the clock. Furthermore EKATO offers the required expertise for plant optimization and preventive maintenance.

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- Highly Developed and Proven Equipment
- State of the Art Design
- Highest Equipment and Process Availability



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