

# **HYPOMIX**<sup>®</sup>

Compact submersible mixer for homogeneous flow formation in process tanks

- slow running, low wear, reliable
- very low energy consumption
- easy handling
- homogeneous, pulsation free flow
- excellent suspension characteristics
- no aerosol discharge due to calm water surface
- can be installed or removed from a full tank without the need for a bridge structure
- corrosion resistant installation



# Applications

In tertiary sewage treatment systems, in particular in nitrogen and phosphorus elimination, mixing systems are needed that not only have low energy input requirements but also fulfill the processing tasks of homogenization and mixing without negative side effects, such as sedimentation, air input, or aerosol discharge.

In large closed circuit tanks, optimized solutions using slow running submersible FlowBoosters<sup>®</sup> are already well known. In the case of tanks of rectangular or round shape we can offer the ABS-HYPOMIX<sup>®</sup> as ideal solution.

Thanks to the hyperboloid shaped mixing body, which is located near the tank floor, this system avoids the well known flow disadvantages of conventional vertical mixers.





The drive, a submersible motor unit, builds a very compact robust installation which can run completely vibration-free and eliminates all the other disadvantages associated with long drive shaft units.

The hyperboloid shape of the mixer body is a logical application of theoretical calculations on flow technology. The jacket surface follows precisely the flow lines of an optimum flow pattern and thereby avoids flow separation and loss inducing turbulence. The tangential components, generated by the flow ribs, overlay the radial and vertical flow so that, even at low flow velocities and the corresponding low energy input, the technical process conditions for homogenization, mass transfer and sedimentation prevention are given.



### HYPOMIX<sup>®</sup> Submersible floor mounted mixer



#### **Mixer body**

Hydraulically optimized hyperboloid body manufactured from synthetic material which is resistant to sewage. The integral floatation body is of closed-pore fully encapsulated hard plastic foam.

#### Gearbox

Robust multistage spur gear of high efficiency, vibrationfree and reliable. Fatigue strength toothed wheel work, designed for a calculated running life of more than 100,000 operating hours. Motor, gearbox and mixer body form a compact unit.

#### Motor

Water pressure tight encapsulated, protection type IP68, stator insulation class F=155°C. Motor shaft and rotor dynamically balanced. Cable inlet with strain relief and anti-kink protection.

Shaft sealing on medium side by means of a high quality silicon carbide mechanical seal, independent of direction of rotation and resisant to temperature shock.

#### Bearings

Motor and mixer shaft bearings comprising deep groove ball bearings, lubricated for life and maintenance free.

Calculated bearing life more than 100,000 running hours.

#### **TCS-System**

Thermo-Control-System = thermal sensors in each phase of the stator which monitor the operating temperature and switch the motor off before the maximum allowable temperature is reached.

It protects the motor in the event of overloading, excessive medium temperature or other fault causes.

# HYPOMIX<sup>®</sup> Installation System

An important factor for operation and mounting of submersible mixers is the actual installation itself. Easy, reliable installation in all types of tanks, easy handling, and corrosion resistance are the requirements placed by modern sewage treatment technology on mixer installations.

The ABS HYPOMIX<sup>®</sup> combines in one unit the flow formation advantages of a vertical mixer with a compact robust submersible drive unit. The number of functional components is considerably reduced. In comparison to conventional vertical mixer systems, a major cost advantage is the fact that a bridge across the tank is not required.

### Mounting

The only installation components which are located below water level are the corrosion resistant rope guide elements. Very little time is required for mounting these parts, which reduces installation costs. The amount of time that a tank must remain out of operation while empty or while being emptied (in the case of retro-fitting of the ABS HYPOMIX<sup>®</sup>) is small. In exceptions it is even possible to install the unit while the tank is full.

#### Installation

The ABS HYPOMIX® (1) is lowered into the tank with a stainless steel rope attached (2) and a suitable hoist (6). A rope hoist pulls in the tension rope and by this means pulls down the ABS HYPOMIX® mixer unit towards the tank floor. A feature of the patented installation system is that the mixer automatically reaches its operating position. The electrical wire rope tension monitoring unit (5) indicates that the required rope tension has been reached. (If adequate rope tension is not available, then operation of the unit is prevented by means of an electrical device). The ABS HYPOMIX<sup>®</sup> mixing system is ready for operation. To remove the mixer the tension rope is just wound back on the worm gear winch. The ABS HYPOMIX<sup>®</sup> will automatically rise to the surface and can then be lifted out of the tank by a hoist for maintenance or other purposes.

# Maintenance

Apart from regular visual examinations, an inspection is necessary after 40 000 operating hours, at least after 5 years. The low speeds of rotation and vibration-free running together with its compact robust design guarantees a long running-life and minimum operating costs.

 ABS HYPOMIX<sup>®</sup> with submersible motor drive
Vectran<sup>®</sup> rope
Corrosion resistant rope guides

Worm gear winch
Electrical rope tension monitoring

6 Optional lifting frame

# **HYPOMIX**<sup>®</sup>



- 1 HYPOMIX® in working position
- 2 Tensioning rope is given by turning the worm gear winch
- 3 HYPOMIX<sup>®</sup> is moved to the surface by its bouancy force
- 4 HYPOMIX<sup>®</sup> is pulled to the tank side and the lifting hook is attached to the eyelet
- 5 HYPOMIX® is lifted and...
- ...swung over the tank side to be placed outside the tank

#### Identification Code HM 2341 . A 14 / 4 - 33 . 14

Hydraulics	
Mixer series	
Hydraulics	
Motor	
Modular motor (50 Hz)	
Motor power P <sub>2</sub> (kW) x 10	
Number of poles	
Motor size	
Speed	

#### Selection

To achieve optimum flow characteristics with a low energy consumption, a selection system in which large amounts of scientific data and a vast range of practical experience are contained, is available.

# **Technical data**

Pro	opeller						Motor				Weight
HYPOMIX Type	Dia- meter mm	Speed min <sup>-1</sup>	Gear motor	Motor power* P <sub>1</sub> kW	P₂ k₩	Motor speed at 50 Hz min <sup>-1</sup>	Rated voltage V	Rated current at 400 V A	Gear ratio i	Cable type** Starting DOL	kg
HM 2341	2300	14	A 14/4	1,79	1,4	1450	400	2,94	93,38	(1)	263
HM 2342	2300	16	A 14/4	1,79	1,4	1450	400	2,94	81,92	(1)	263
HM 2343	2300	19	A 14/4	1,79	1,4	1450	400	2,94	72,57	(1)	263
HM 2344	2300	21	A 14/4	1,79	1,4	1450	400	2,94	63,88	(1)	263
HM 2345	2300	22	A 30/4	3,71	3,0	1450	400	6,50	60,35	(1)	264
HM 2346	2300	26	A 30/4	3,71	3,0	1450	400	6,50	52,82	(1)	264
HM 2347	2300	28	A 30/4	3,71	3,0	1450	400	6,50	47,60	(1)	264
*P1 = Power taken from mains: $P_2$ = Power at motor shaft **(1) = A07RN-F100								G1.5			
Supplied as standard with 15 m cable and free cable ends.											

Design

Compact water pressure tight encapsulated unit construction with hyperboloid mixer body for optimum operating results with minimum energy input.

**Motor:** Three phase 380 - 420 V, 50 Hz, 4-pole (1450 min<sup>-1</sup>), insulation class F = 155°C, protection type IP 68.

Motors for other voltages and for 60 Hz are also available.

**DI-System for seal monitoring:** Consisting of an electrode in the connection chamber.

**TCS-Thermo-Control-System:** With bimetallic contacts as thermal sensors in the stator to give an visual or acoustical warning or switch off the motor in the event of overheating.

**Bearings for motor shaft:** Top and bottom ball bearings, lubricated for life and maintenance free.

**Bearings for propeller shaft:** Consisting of two deep groove ball bearings, running in an oil bath.

All bearings have been designed for a calculated life  $\rm L_{_{H10}}\! >\! 100,\!000$  hours.

**Gearbox:** Robust multistage spur gear. Fatigue strength toothed wheel work and long running life, oil lubricated.

**Mixer body:** Designed for optimum flow, hyperboloid mixer body with diameter 2300 mm.

Shaft sealing: On the motor side by means of radial

lip seals, medium side by means of a silicon carbide mechanical seal, independent of direction of rotation, running in the oil bath of the oil chamber.

# Materials

Motorhousing	Cast iron GG-25
Gearbox	Cast iron GG-25
Mixer body	PUR
Gear shaft	Stainless steel 1.4021
Fasteners	Stainless steel 1.4401
Surface protection	2-component Epoxy-coating

# Dimensions



# **HYPOMIX®**





# Application examples



**Example 1** Denitrification tank 12.5 m x 12.5 m x 6 m





**Example 3** Phosphorus elimination tank 42 m x 14 m x 6 m

# ABS offers the complete range

#### AFP

Submersible pumps from 1.3 to 850 kW. Pressure-tight encapsulated fully flood-proof motors. Hydraulics with ContraBlock®-System or closed, single or multivane impellers for handling clear water, polluted water, sewage containing solids, faecal slurry and sludge.

Suitable for both wet well and dry well installation.



# **FlowBooster**®

Low speed, highly efficient submersible mixer with a wide range of applications for use in industrial and municipal treatment plants.

Mono-cast propeller and patented mixer coupling system.

## System Frings<sup>™</sup>

Self-aspirating submersible aerators for wastewater and water treatment in municipal and industrial plants.

Main areas of application are mixing and equalisation tanks, activated sludge tanks, SBR-reactors and sludge storage tanks.

Oxygen transfer up to 70 kgO<sub>2</sub>/h, motor output, max 75 kW.



#### JUMBO<sup>®</sup>

Submersible pumps made for those truly tough dewatering jobs. These easy to install pumps are often used in tunnelling and mining where the reliability of the equipment is a crucial parameter.



# **ECOMIX®** RW 300 - 900

Submersible mixers with motors from 1.5 to 22 kW for mixing. blending, dissolving and suspension of solids in municipal and industrial treatment plants.



## **Genuine ABS Accessories**

The best basis for an easy installation and a troublefree operation of your plant. Pedestals, coupling rings, pipe covers, check valves,... ABS - "Whatever

you need". Order your copy of the accessory catalogue today.



COST-EFFECTIVE PUMPING

ABS reserves the right to alter specifications due to technical developments

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