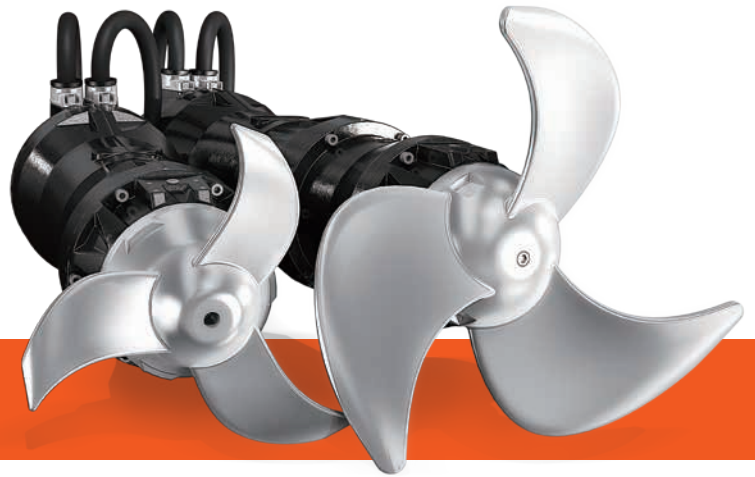


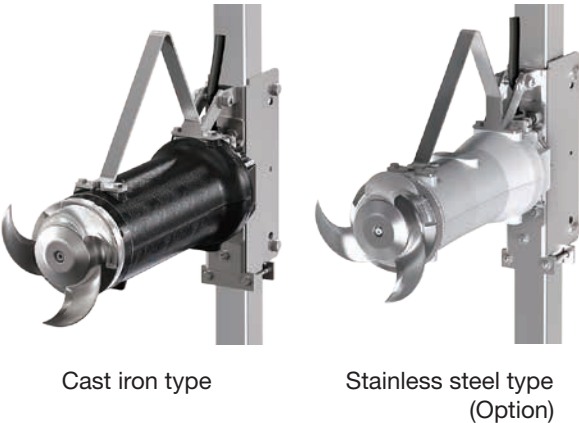
TSURUMI AVANT
SERIES
MMR

SUBMERSIBLE
MIXERS



TSURUMI AVANT

TSURUMI AVANT is a brand of submersible pumps and wastewater treatment equipment developed with an eye on the future by TSURUMI, a leading company in the field of submersible pumps for over 95 years. TSURUMI created it to deliver the maximum in customer satisfaction, by pooling years of know-how garnered with submersible pumps and wastewater treatment equipment into a series of premium grade products. This includes completely revamping everything from the materials used for components to the product lineup itself. The premier brand is being released under the name of TSURUMI AVANT.



MMR-series

Cast iron type — Motor in efficiency class IE3

- DIRECT TRANSMISSION (200 - 300 - 400 series)**
- 4 - 6 - 8 poles motor with DIRECT TRANSMISSION
 - Motor power 0.75 - 4.5 kW
 - Propeller Ø 200 - 300 - 400 mm

- REDUCTION GEARS (650 series)**
- 4 poles motor with REDUCTION GEARS
 - Motor power 4 - 7.5 kW
 - Propeller Ø 650 mm

Stainless steel type available (Option)

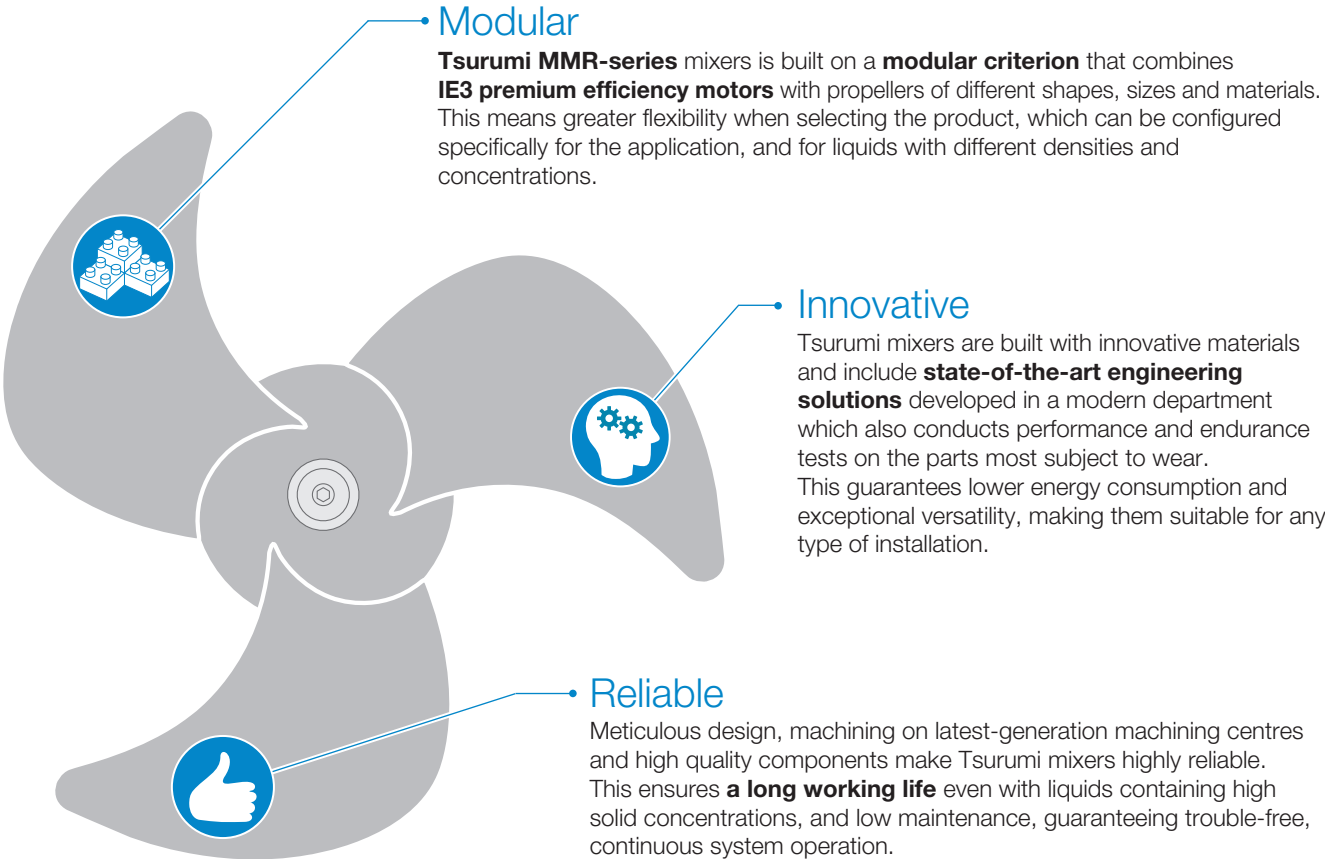
The MMR-series of the TSURUMI AVANT brand features premium grade submersible mixers with a built-in IE3 premium efficiency motor. These durable compact mixers come in standard with EN-GJL-250 cast iron body, AISI 316 stainless steel propeller, AISI 431 stainless steel shaft and Tsurumi's typical dual inside mechanical seals with silicon carbide faces in the oil chamber. As an option, models are also available with a stainless steel body made of AISI 316. Either way, these high quality mixers guarantee users a high level of reliability and stability. The MMR-series can be chosen from a wide lineup of propeller sizes (200 - 650 mm) and motor outputs (0.75 - 7.5 kW). Moreover, an array of accessories is available for installing the mixers anywhere inside a tank as a new installation or replacement of existing equipment.

DIRECT TRANSMISSION	Motor		+	Propeller Ø [mm]
	P2 [kW]	4 - 6 - 8 poles		
	0.75 - 4.5			200 - 300 - 400

REDUCTION GEARS	Motor		+	Propeller Ø [mm]
	P2 [kW]	4 poles		
	4 - 7.5			650

Characteristics of submersible mixers with IE3 motor

- Innovative cable gland system with cable holder. The universal thread ring-nut can be removed to fix a rigid or flexible duct to the cable gland to protect the cable from physical and mechanical stresses.
- Premium IE3 class cold-running motor for high efficiency and minimal energy use. Insulation class H (180°C).
- Double silicon carbide (SiC) mechanical seals protected inside a large, inspectable oil chamber. MMR 650-series equipped with 3 mechanical seals.
- Cast AISI 316 stainless steel propeller, designed with specially shaped blades to ensure high hydraulic efficiency and prevent fouling with filaments and solids. Extra thick for ruggedness and reliability even in heavy-duty conditions.
- Water sensor detecting seepage into the mechanical seal oil chamber. The temperature sensor prevents possible damage due to overheating of the motor. Bearing temperature sensors are available on request. (other monitoring options are available for the MMR 650-series on request)
- Wide range of rugged stainless steel accessories for optimal installation in relation to the system layout and when replacing existing devices.



Features

Submersible mixers are the most practical and efficient solution for mixing, agitating, homogenizing and equalizing wastewater at treatment facilities. They are used in aerobic as well as anaerobic and anoxic stages of wastewater treatment processes to prevent sedimentation and maintain constant concentration levels in the tanks. Propellers for mixers are sized, shaped and driven at speeds designed to match the site requirements.

MOTOR

Premium IE3 class cold-running motor for high efficiency and minimal energy use. Insulation class H (180°C).

MECHANICAL SEALS

Double silicon carbide (SiC) mechanical seals in large, inspectable oil chamber. MMR 650-series equipped with 3 mechanical seals. (2 in the oil chamber and 1 in the gearbox)

PROPELLER

Cast AISI 316 stainless steel propeller, designed with specially shaped blades to ensure high hydraulic efficiency and prevent fouling with filaments and solids. Extra thick for ruggedness and reliability even in heavy-duty conditions.

A special chopper system in the rear of the propeller prevents the entry of filaments which could become entangled around the drive shaft and impair its operation.

MONITORING

Water sensor detecting seepage into the mechanical seal oil chamber. The temperature sensor prevents possible damage due to overheating of the motor. Bearing temperature sensors are available on request. (other monitoring options are available for the MMR 650-series on request)

CABLE GLAND

Innovative cable gland system with cable holder. The universal thread ring-nut can be removed to fix a rigid or flexible duct to the cable gland to protect the cable from physical and mechanical stresses.

INSTALLATION

Wide range of rugged stainless steel accessories for optimal installation in relation to the system layout and when replacing existing devices.

BEARINGS

Ball bearings with lifetime lubrication designed to guarantee 100,000 working hours. Temperature sensor on request.

REDUCTION GEARBOX [MMR 650-series]

Rugged planetary reduction gearbox which provides high reduction ratios and torque transfer and withstands heavy radial loads, with compact size and light weight.

Range characteristics

		Motor			Propeller		
Series		P ₂ [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 200	DIRECT TRANSMISSION	0.75 - 1.5	4	1450	200	165 - 230	1450
MMR 300		1.5 - 3.2	6	960	300	350 - 820	960
MMR 400		3.0 - 4.5	8	750	400	625 - 1060	750

		Motor			Propeller		
Series		P ₂ [kW]	Poles	Rotation speed [rpm]	Propeller Ø [mm]	Thrust [N]	Rotation speed [rpm]
MMR 650	REDUCTION GEARS	4.0 - 7.5	4	1450	650	1025 - 2100	202 - 300

For detailed specifications of each models, refer to the data booklet [IA158].

Construction materials

	Standard	Optional
Motor complex	Cast iron EN-GJL-250	AISI 316 stainless steel
Propeller	AISI 316 stainless steel	Duplex / With Vulkollan coating
Shaft	AISI 431 stainless steel	-
Mechanical seals	Double silicon carbide (SiC) in oil chamber	-
Nuts and bolts	A2-70 Stainless Steel	A4 stainless steel
Gaskets	NBR	FPM (FKM)
Hook	AISI 304 stainless steel	AISI 316 stainless steel
Motor bracket	AISI 304 stainless steel	AISI 316 stainless steel
Paintwork	Bicomponent epoxy paint 200 µm	Bicomponent epoxy paint 400 µm

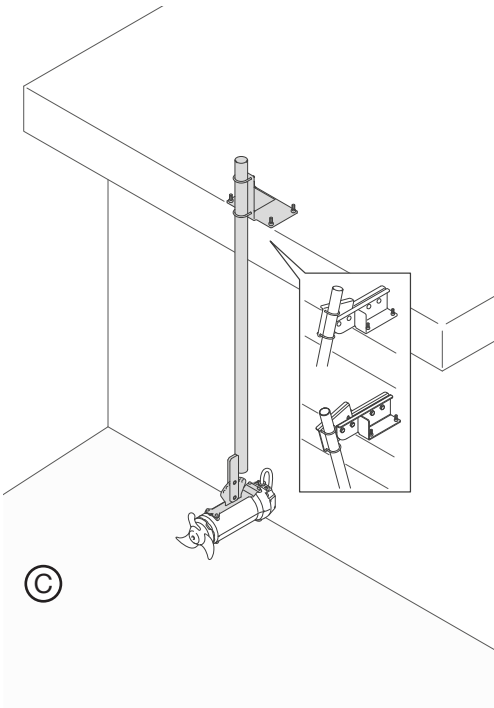
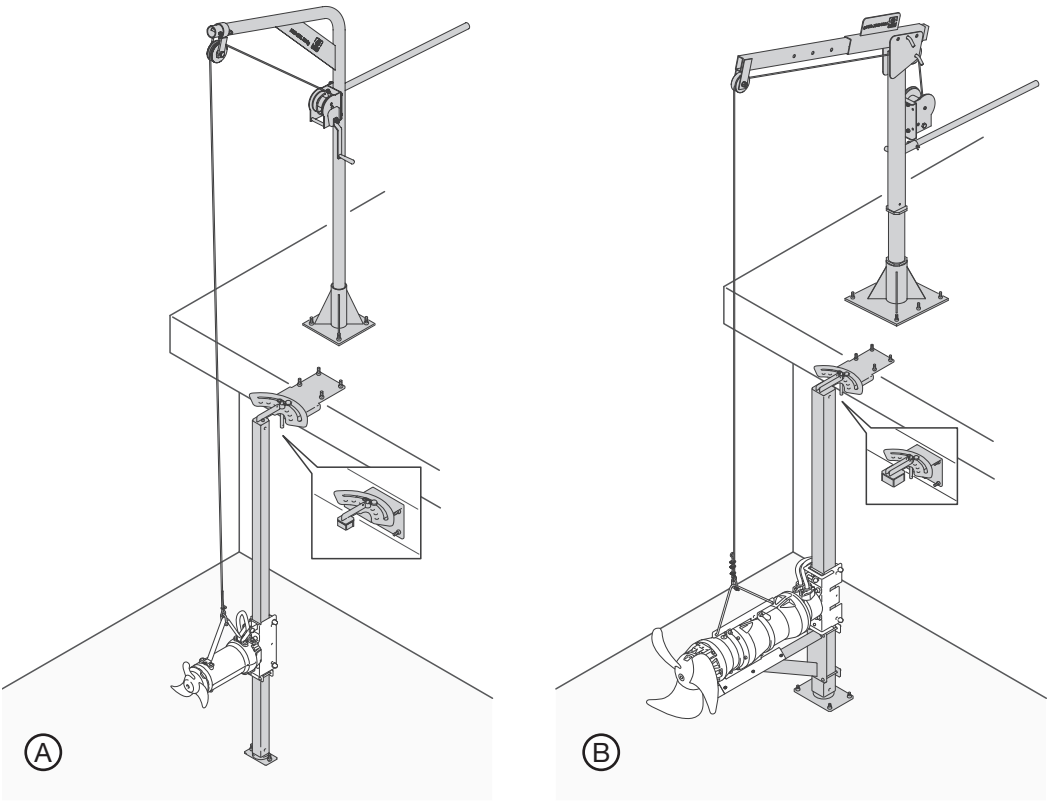
Operating limits

Max. ambient temperature	40°C
Max. immersion depth	20 m
pH of treated liquid	6 - 12
Max. starts/hour	15 (evenly distributed)
Max. acoustic pressure	70 dB
Duty	S1 – continuous operation
Density of treated liquid	1060 kg/m³
Max. dynamic viscosity	500 mPas

Installation and accessories

To guarantee top mixer performance, Tsurumi has developed a wide range of accessories for adjusting devices' positions in the tank and lifting and removing them without having to drain the system. Designed for easy installation and generously sized to guarantee durability, accessories are available in galvanised or stainless steel.

The recommended installation modes are:



Mast installation (fig. A and B)
The most widely used installation mode, suitable for mixers of any shape and size.
The mixer, fitted with a runner which is also compatible with existing installations, slides along a square post and can be removed with no need to drain the tank, thanks to rugged lifting jib cranes.
The mixer can be horizontally adjusted for the best possible position, while vertical adjustment is possible with the aid of special optional runners.

Pendular installation (fig. C)
Mobile installation in which the mixer can be both installed and removed with the tank full.
The mixer is suspended from a suspension pipe and fixed to a mounting bracket; it can be adjusted both horizontally and vertically.



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We reserve the right to change the specifications and designs without prior notice. The OO series and model OO are indicated with our series/model codes in this catalog.

**TSURUMI
MANUFACTURING CO., LTD.**

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