

triwa

for water technologies

MBBPAC™

MBBR & TERTIARY TREATMENT PACKAGE UNIT



Introducing the MBBRPAC™ : A Comprehensive Solution for Waste Water Treatment

Our **MBBRPAC™** package unit offers an efficient and space-saving solution for waste water treatment. Featuring **high-efficiency Free floating Biofilm Carrier Media** in the MBBR section, it ensures superior effluent quality. **Lamella plates** in the sedimentation tank enhance settling efficiency, while **our signature design includes a filtration room for consolidated tertiary treatment**. This modular unit can be tailored to meet customer requirements, providing a streamlined and effective waste water treatment solution.



Compartments:

- Anoxic Compartment
- Moving Bed Biofilm Compartment
- Activated Sludge Compartment
- Sedimentation Compartment
- Control & Tertiary Treatment Compartment

Standardized Models & Capacities

MBBRPAC™ Series is a fully modular, factory-built wastewater treatment solution designed around MBBR (Moving Bed Biofilm Reactor) technology.

Our design gives clients the speed of packaged plants, the efficiency of advanced biological treatment, and the confidence of long-term performance backed by international standards.



Models:

- MBBRPAC™ -50 - 50 m³/day
- MBBRPAC™ -100 - 100 m³/day
- MBBRPAC™ -150 - 150 m³/day
- MBBRPAC™ -200 - 200 m³/day
- MBBRPAC™ -330 - 330 m³/day

*tailored capacities available upon request

Building Block & Configuration

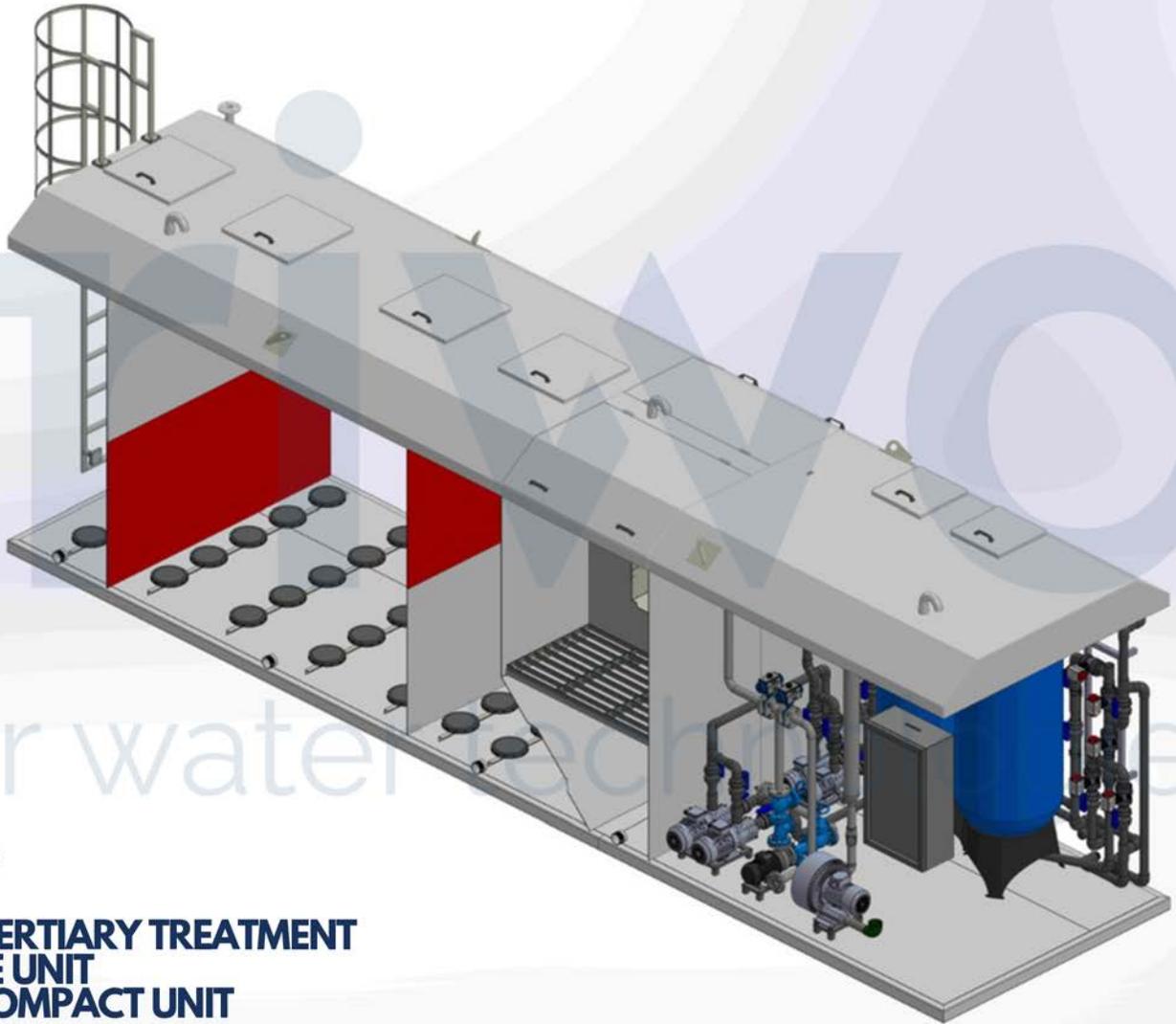
Single Compact Units

- **MBBRPAC™** -50 - 50 m³/day
- **MBBRPAC™** -100 - 100 m³/day
- **MBBRPAC™** -150 - 150 m³/day
- **MBBRPAC™** -200 - 200 m³/day
- **MBBRPAC™** -330 - 330 m³/day

Building Block Units

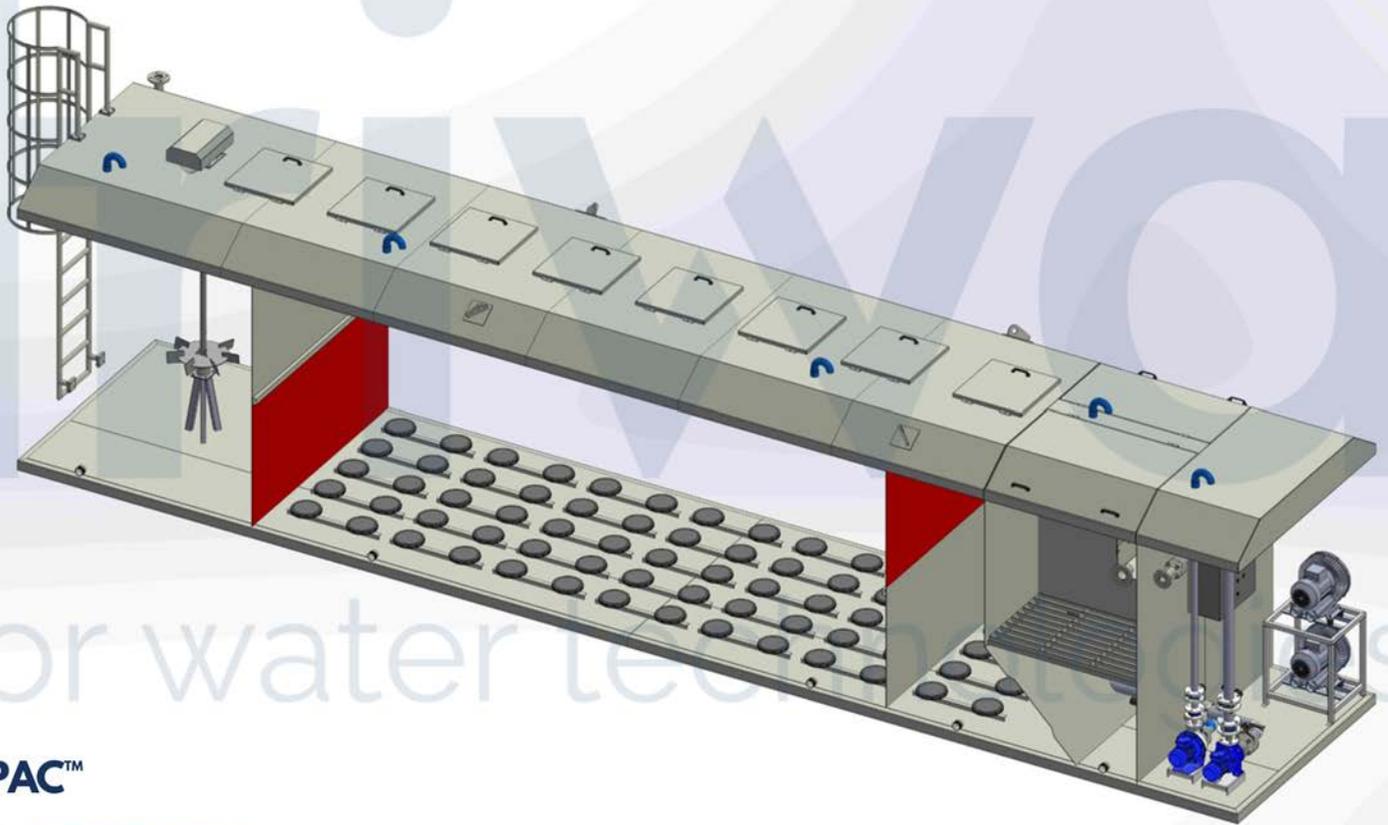
- **MBBRPAC™** -250 - 200 m³/day
- **MBBRPAC™** -300 - 300 m³/day
- **MBBRPAC™** -330 - 330 m³/day

Using our building block units MBBRPAC™ to create a centralized plant capable of treating up to 1,500 ,m³/day



MBBPAC™

**MBBR & TERTIARY TREATMENT
PACKAGE UNIT
SINGLE COMPACT UNIT**



MBBPAC™

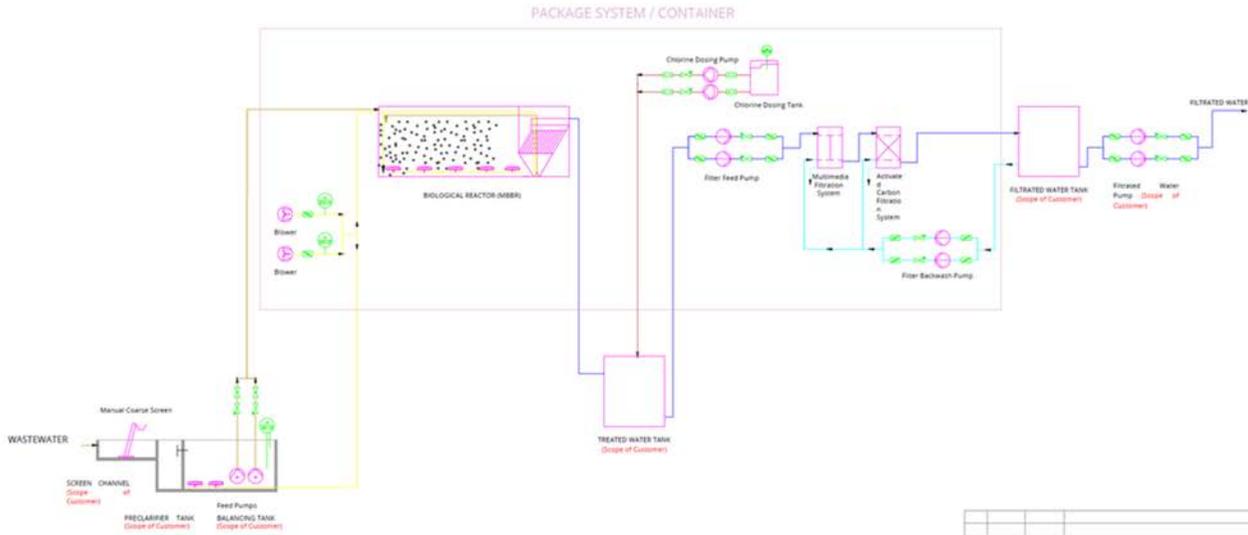
**MBBR & TERTIARY
TREATMENT PACKAGE UNIT
BUILDING BLOCK UNIT**

Typical Equipment Selection

MBBRPAC™	Included	Optional
Course Screen	X	
Balancing Tank Aeration System		X
Submersible Feed Pumps	X	
Anoxic Tank + Recirculation System		X
MBBR Tanks	X	
MBBR Media	X	
Blowers + Diffuser Gride	X	
Lamella Clarifier & Activated Sludge	X	
Tertiary Feed & Backwash Pumps	X	
MultiMedia & Activated Carbon Filter	X	
Centralized PLC & MCC Panel inc. HMI	X	
Quality Sensors		X



Typical Process Flow Diagram



REV	NO	DATE	BY	REVISION
TITLE				
WASTEWATER TREATMENT SYSTEM				
DRAWING NO (INDEX LETTER)				
GEN. PLAN				
DRAWING NAME :				
MBBR FLOW DIAGRAM				
DATE	NAME	SIGNATURE		
DRAWN	S.K.			
CHECKED	V.T			
APPROVED	V.T			
			SHEET	SCALE
			1	REV. NO.



Typical Design Basis

Raw Water Parameters

Parameters	Value	Unit
BOD5 (Biological Oxygen Demand)	< 250-300	ppm
COD (Chemical Oxygen Demand)	< 500-600	ppm
TSS (Total Suspended Solids)	< 250	ppm
TN (Total Nitrogen) < 40	< 40	ppm
TP (Total Phosphorus)	< 10	ppm
pH	7	-

Treated Water Parameters

Parameters	Value	Unit
BOD5 (Biological Oxygen Demand)	< 45-50* < 10-15**	ppm
COD (Chemical Oxygen Demand)	< 80-120	ppm
TSS (Total Suspended Solids)	< 15	ppm
pH	6 - 7	-

*Value output is from MBBR

**Value output is from Water Recycling system

Why choose MBBRPAC™ ?

Package units deliver smaller footprint, faster delivery, and scalable capacity, with comparable or better effluent quality and lower lifecycle.



- Key wins
 - **Time-to-water:** packages commissioned in 12–16 weeks vs 6–9 months civil program.
 - **Footprint:** MBBR 30–50% smaller biological volume than EA.
 - **Energy:** MBBR typically 0.25–0.45 kWh/m³ vs EA 0.35–0.60 kWh/m³ (indicative, blower selection dependent).
 - **Resilience:** biofilm system handles load swings better; faster recovery after upsets.
 - **Scalability & redeployment:** add trains; can relocate/reuse assets.

Preventive & Corrective Maintenance Advantages

Modular MBBR package units are designed to maximize operational continuity and minimize lifecycle maintenance challenges often seen in large, monolithic concrete treatment systems.

Key Maintenance Advantages of the Modular Package-Unit Design

- **Independent Treatment Modules:** Each module functions as a self-contained biological treatment line. If one module requires attention, it can be isolated while the remaining modules continue operating – preventing disruption to overall treatment performance.
- **Preventive Maintenance Without Shutdown:** Typical maintenance tasks such as blower servicing, pump replacement, diffuser inspection, and media retention screen cleaning can be carried out on a single module at a time, maintaining treatment capacity and stable effluent quality throughout.

- **Reduced Risk of Full-Plant Downtime:** Unlike traditional single-basin systems where maintenance affects the entire process, modular designs allow selective shutdowns, minimizing operational vulnerability and treatment delays.
- **Fast Post-Maintenance Recovery:** MBBR biofilm remains intact even if a train is offline, allowing quick biological recovery compared to MLSS-based systems.
- **Local Control Panels:** Each MBBR package includes a local control panel that can override the central PLC. This provides:
 - Operation during PLC or communication troubleshooting
 - Manual/standalone mode if central SCADA is disrupted
 - Increased operational resilience
- **Improved Safety & Accessibility:** Skid-based equipment eliminates confined-space entry, making inspections and corrective actions faster and safer.

This modular design results in higher uptime, safer interventions, and significantly reduced lifecycle O&M risk.

Package Units Vs. Conventional Tanks

Criterion	Package Units (Steel/FRP, Containerized/Skids)	Reinforced Concrete / Tanks (Cast-in-place)
Time-to-water	12–16 weeks factory build + site hookup; parallel civil works minimized	6–9 months incl. design, permitting, excavation, curing
Footprint	Compact, stacked/vertical layouts possible	Larger footprint; fixed geometry
Capex	Lower upfront civil; predictable factory cost; potential higher equipment %	Heavy civils (excavation, formwork, rebar); cost uncertainty with ground conditions
Lifecycle	30 yrs for coated steel/FRP with maintenance; modules replaceable/upgradeable	30 yrs structure life; embedded layout hard to modify
Scalability	Add trains/containers as flows grow; easy to right-size	Expansion requires major civils; long downtime

Mobility/ Residual value	Redeployable; lease/BOT viable; retains asset value	Immobile; minimal residual beyond site
Quality control	Factory FAT; repeatable QA/QC	Site-dependent workmanship; weather risks
Installation risk	Low; plug-and-play interconnects	High; interfaces, leaks, groundwater, curing
O&M access	Enclosed equipment rooms; ergonomic skids	Deep basins; more confined-space entries
Permitting	Often simpler; temporary/semipermanent options	Full civil/structural permits; longer cycle

Notable Projects

NEOM, KSA

- **Capacity:** 1,000 CMD
- **Model:** MBBRPAC™-1000
 - Building Block Unit:
MBBRPAC™-250
- **Footprint:** 15X25 m
- **Project Description:** Package unit MBBR including Containerized Tertiary Treatment and Centralized Control Room



Notable Projects

Dahka, Bangladesh

- **Capacity:** 3,000 CMD
- **Application:** Textile Factory Effluent
- **Model:** MBBRPAC™-3000
 - Configuration: Tailor Designed for Effluent parameters.
- **Footprint:** 15X25 m
- **Project Description:** Package unit MBBRPAC, DAF and Containerized Tertiary Treatment and Centralized Control Room



Notable Projects

Tekirday, Türkiye

- **Capacity:** 350 CMD
- **Application:** Textile Factory Effluent
- **Model: MBBRPAC™-350**
 - Configuration: Tailor Designed for Effluent parameters.
- **Footprint:** 150 m²
- **Project Description:** Package unit MBBR, Lamella Clarifiers DAF, Scrapers, and Containerized Tertiary Treatment and Centralized Control Room



trivva

for water technologies

**engineering simplicity to solve water
complexity**

TALK TO US

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