

Water Treatment Media

Product range and sizing reference · Nuowaisen Environmental · Gongyi, Henan, China

This document summarises the media and equipment we manufacture, the specifications we publish for each family, and the sizing arithmetic a buyer needs before requesting a quotation. Every figure below is published on our website and can be checked there. Prices are quoted on request against a stated specification, quantity and delivery term.

1. Settling media: tube settler and lamella modules

Shallow-depth settling media used in clarifiers, grit removal and retrofits. Water passes through small channels that keep the flow laminar, so particles settle in a fraction of the depth required by a conventional basin.

Parameter	Published value
Cell size	Φ25 / 35 / 50 / 60 / 80 / 90 mm
Module size	1000 × 500 × 1000 mm
Installation angle	60° to the horizontal
Hydraulic loading	3–5 t/m ² ·h
Channel velocity	2.5–3.0 mm/s
Specific surface	62–236 m ² /m ³
Porosity	93–97 %
Stacking height	4–5 m
Material	PP / FRP / stainless steel (sheet 0.4 / 0.5 / 0.8 mm for Φ35 / 50 / 80)
Service life	PP 3–4 years; PP-PE co-polymer 8–10 years

Sizing method

- Settling area = design flow ÷ hydraulic loading
- Volume = settling area × stacking height
- Add a cutting allowance for troughs, walls and scraper openings, then round up to whole modules

- Check that the channel velocity stays inside 2.5–3.0 mm/s; above that the flow is no longer laminar and more media will not correct it

Worked example: $2,400 \text{ m}^3/\text{day} = 100 \text{ m}^3/\text{h}$. At $4 \text{ t}/\text{m}^2\cdot\text{h}$ the settling area is 25 m^2 . At a 4.5 m stack the net volume is 112.5 m^3 , which is 225 modules before any cutting allowance.

2. MBBR biofilm carriers

HDPE moving-bed carriers that keep a protected biofilm circulating in the reactor. Used for upgrading existing aeration tanks without new civil works.

Parameter	Published value
Series	K1 / K2 / K3 / K4 / K5 (HDPE)
Dimensions	K1 $\Phi 10 \times 10 \text{ mm}$ (4–5 chambers) through K5 $\Phi 25 \times 5 \text{ mm}$ (64 chambers)
Specific surface	K1–K2 above $800 \text{ m}^2/\text{m}^3$; K3–K4 above 900–1000; K5 above $1000 \text{ m}^2/\text{m}^3$
Density	0.96
Porosity	above 85–90 %
Fill fraction	15–67 % of reactor working volume
Biofilm formation	3–15 days
Nitrification rate	$400\text{--}1200 \text{ gN}/\text{m}^3\cdot\text{day}$
Service temperature	5–60 °C
Service life	more than 15 years

Sizing method

- Mass removed per day = flow $\times$ (inlet – outlet) concentration
- Carrier volume = mass load $\div$ the removal rate published for the series ($\text{g}/\text{m}^3\cdot\text{day}$)
- Fill fraction = carrier volume $\div$ reactor working volume; it must land inside 15–67 %
- Repeat the calculation for ammonia and take the larger answer

Worked example: $1,000 \text{ m}^3/\text{day}$, BOD from 300 to 30 mg/L = $270 \text{ kg}/\text{day}$. At $4,000 \text{ g}/\text{m}^3\cdot\text{day}$ the carrier volume is 67.5 m^3 , which is a 22.5 % fill in a 300 m^3 reactor.

3. Disc aerators

Parameter	Published value
Diameter	215 / 260 / 300 mm
Membrane material	EPDM (215 and 260 mm) or silicone (300 mm)
Membrane type	Elastic, closes its slits when the air is shut off
Bubble size	1–3 mm
Location	On air headers laid along the basin floor; removable by section without draining
Maintenance	Membrane is a wear part, replaced separately without changing the disc

Air must be clean and oil-free; this is the single biggest factor in membrane service life.

4. Filter nozzles and false floor plates

Nozzles are counted, not measured by volume. The count follows from the plate area divided by the area one nozzle serves.

- For a triangular layout, area per nozzle is approximately $0.866 \times \text{pitch}^2$
- A 150 mm pitch gives roughly 51 nozzles per m²
- Order by rows rather than by the bare number, because edge trimming adds a few
- The pitch itself follows from the backwash rate and the allowable head loss, not from a catalogue

Worked example: a 20 m² plate on a 150 mm triangular pitch needs about 1,030 nozzles.

5. Folded-plate flocculator (flocculation baffle box)

A hydraulic flocculator with no impeller and no power input. Flow passes through a channel formed by folded plates, and each fold alternately contracts and expands the flow, shedding micro-vortices that bring particles into contact.

Parameter	Published value
Plates per section	clear width ÷ (fold pitch + clear gap), rounded up to a whole plate
Worked example	2,000 mm clear width, 100 mm fold pitch, 50 mm clear gap → 150 mm pitch unit → 13 plates per section
Moving parts	None

Installation	Modular plate packs in a supporting frame, concrete basin or channel
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6. ABS pipe and fittings

Parameter	Published value
Confirmed size	DN20
Other sizes	Diameter, wall thickness and pressure class confirmed against the current pipe range
Material	ABS (acrylonitrile butadiene styrene)
Joining	Solvent cement, threaded or flanged
Properties	Does not corrode, does not swell in water, does not affect taste or odour

7. What to send with an enquiry

Family	Inputs that decide the quantity	Ordered in
Settling modules	Design flow, hydraulic loading, basin plan, stacking height, layer arrangement	m ³ and module count
MBBR carriers	Flow, inlet and outlet concentrations for every limited parameter, reactor working volume	m ³ of carrier and % fill
Disc aerators	Water depth, oxygen demand, air rate available	pieces
Filter nozzles	Plate area, pitch, backwash rate, allowable head loss	pieces, by rows
Flocculator	Clear width, design flow, velocity profile, stage count	sections and plate count
ABS pipe	Diameter, pressure class, line routing, medium and temperature	metres and fittings

Write the unit next to every number, and write down the assumption the number depends on. "200 m³" is a quantity somebody guessed. "25 m² of settling area at a 4.5 m stack, cut for the layout attached" is a specification that can be priced, checked and built.

8. About Nuowaisen Environmental

We manufacture water treatment media and aeration equipment in Gongyi, Henan, China. Our range covers tube settler and inclined plate media, MBBR biofilm carriers,

suspended and random tower packing, hanging media, fibrous filter media, disc, tube and plate aerators, filter nozzles and false floor plates, and ABS pipe and fittings.

We publish specifications so that a buyer can size and check the media inside the plant they have already designed. We are not an EPC contractor and we do not design plants for third parties; what we do is size the media inside your design, check that the numbers close, and say so when they do not.

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