

Pioneering for You

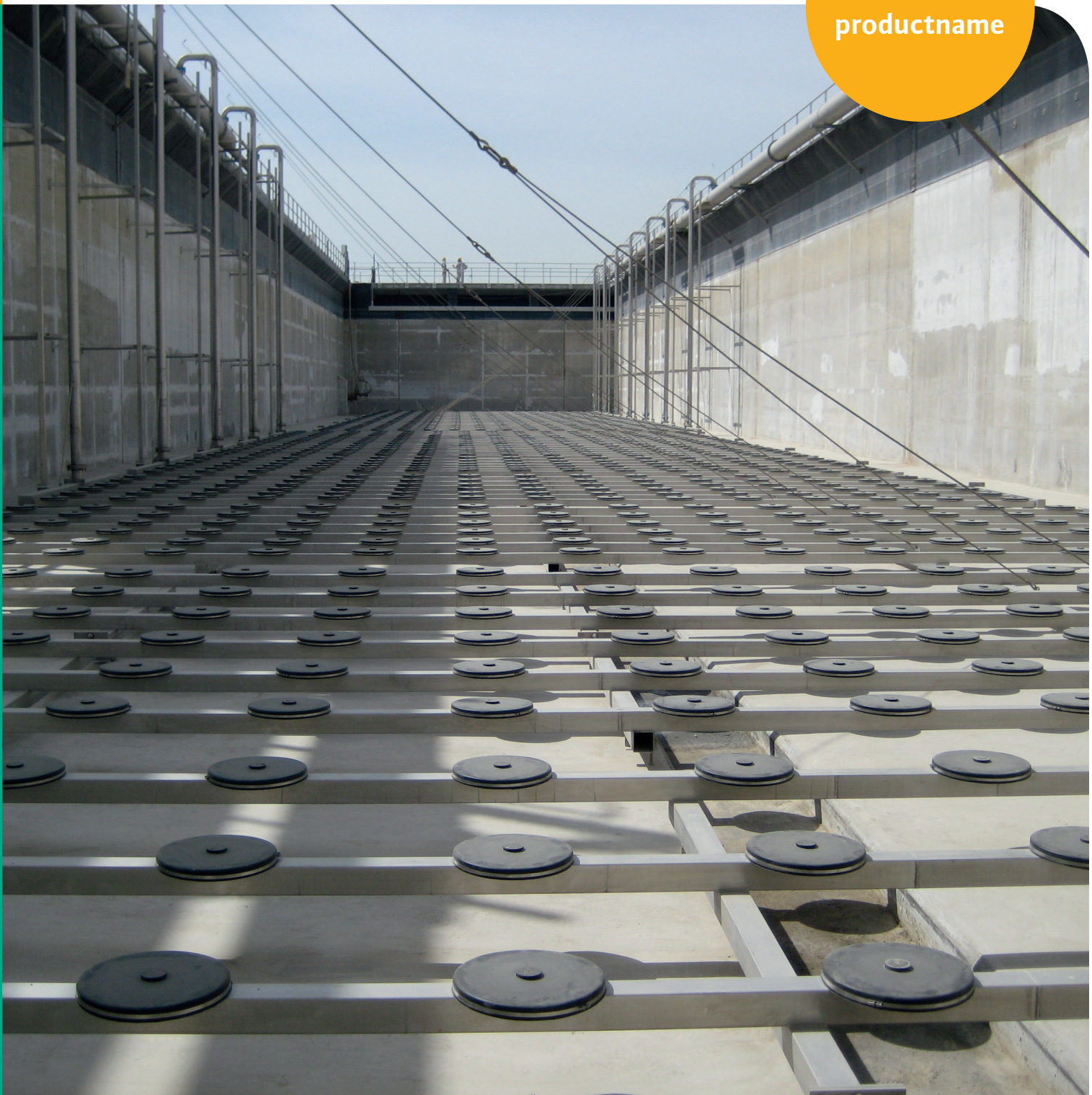
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Range leaflet – edition 03/2018

Wilo-Sevio ELASTOX®-D

Disc diffuser

New
productname





Wilo-Sevio ELASTOX®-D

Application

- For fine-bubble compressed air aeration within the biological treatment stage
- Depending on application and basin geometry: Use as surface, wide-band or line aeration and for aeration with simultaneous circulation
- Preservation aeration of sewage, e.g. in buffer tanks
- Oxygen entry in activated sludge tanks for specific nitrification
- Oxygen entry for sludge stabilisation
- Aeration of rivers and lakes
- Aeration of fish ponds
- Regulation of pH value by stripping CO₂

Function

At rest, the diaphragm rests firmly on the flat supporting plate. Only when the internal air pressure of the aeration system is greater than the static pressure of the surrounding water, the diaphragm rises slightly from the supporting body so that the air in the emerging intermediate space can be distributed.

The optimised perforation of the diaphragm ensures fine-bubble and uniform coalescence-free aeration of the fluid.

Intermittent operation

Intermittent operation allows modern process engineering to be utilised (e.g. nitrification/denitrification) even for existing systems.

Special features/product advantages

- High system efficiency due to very good specific oxygen entry with low pressure loss owing to optimised diaphragm perforation
- Unique safety response because of lift restriction of the diaphragm with integrated spring-mounted non-return valve
- High quality and long service life of diaphragms owing to the production of moulded products
- Low installation costs and low conversion cost, so ideal for modifying and retrofitting existing plants in need of increased efficiency

The structural design prevents ingress of the fluid into the diffuser or pipe system when pressure is relieved.

- The resilience allows the diaphragm perforation to close while simultaneously lying flat on the supporting or carrier structure.
- The Wilo-Sevio ELASTOX®-D disc diffuser is distinguished by an extra integrated spring-loaded non-return valve with a unique safety response, not only for intermittent operation, but also in the event of damage. If, for instance, the diaphragm is damaged, the amount of leaking air is reduced so that even if individual diffusers are destroyed, there is no immediate need for action on the whole system.

Description/function

The Wilo-Sevio ELASTOX®-D disc diffuser has an exclusively upwards-facing aeration surface.

The diaphragm is produced as a moulded product and on its perimeter has a form fit matching the supporting structure. In addition, the diaphragm is fixed to the supporting structure by means of a special fixation band.

The air intake is supplied and the diffusers are attached to the manifold via a sleeve connection G1"i integrated into the supporting structure. The feed pipe is sealed with a suitable O-ring Ø 32 mm. The structural design of the diffusers is devised such that replaceability with other disc diffusers is generally assured. Special adapters are available for particular types of installation or connection systems.

Characteristics			
Dimensions		gross	net/effective
Diameter	mm	~ 320	~ (300) 70
Height	mm	~ 35	~ 30
Area	cm ²	~ 800	~ 650
Minimum spacing	mm	~ 200	~ 200
Weight per unit	kg	~ 0.83	~ 0.83

Materials

All materials were chosen in such a way as to ensure excellent resistance to the predictable chemical and biochemical effects during the biological sewage treatment.

The supporting body is made from eco-friendly polypropylene.

The diaphragm material is particularly significant in terms of its resistance to ageing and the overall efficiency it brings to the aeration systems. The diaphragm is produced under optimum vulcanisation conditions as a high-quality moulded product.

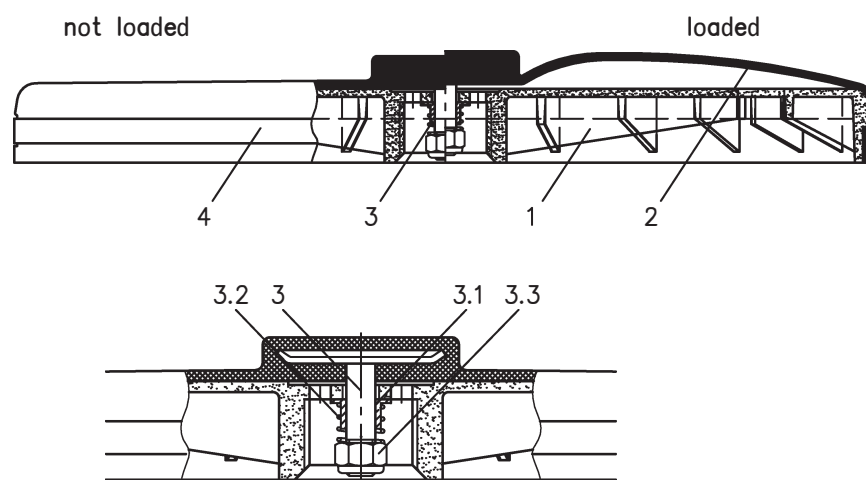
The diaphragm materials have been specially developed on the strength of many years of experience. They have been optimised in numerous test runs and guarantee a long service life.

EPDM	EPDM diaphragm
EPDM-mb	EPDM diaphragm in microbe-resistant version; reduced affinity to biological deposit formation due to a specially cross-linked additive
Silicone	Plasticizer-free diaphragm made from silicone with very good thermal and chemical resistance and anti-adhesive surface characteristics

Characteristics of materials			
No.	Designation		
1	Supporting body	PP	polypropylene
2	Diaphragm	EPDM EPDM – mb SIL	microbe-resistant silicone
3	Lift restriction	Stainless steel	vulcanised
3.1	Sleeve	PP	polypropylene
3.2	Return spring	VA	Stainless steel
3.3	Self-locking nut	VA	Stainless steel A4
4	Fixation band	VA	Stainless steel A4
	O-ring Ø 32 mm	NBR	

Dimension drawing

Disc diffuser Wilo-Sevio ELASTOX®-D



Subject to change without prior notice.

Wilo-Sevio ELASTOX®-D

Consulting guide

The perforation of the diaphragm opens when air is supplied and the compressed air flows in the form of small bubbles from the diffuser into the surrounding sewage. After the air is disconnected and the pressure is relieved within the distribution system, the water pressure coupled with the resilience of the diaphragm ensure that the perforation and the air outlet openings on the carrier structure close.

In order to achieve optimised aeration and separation of the emerging air bubbles from the diaphragm surface, the spacing between the pores and their size are defined precisely so that air-bubble coalescence is avoided or minimised as early as during the formation process.

Characteristics				
Perforation/buoyancy		Type "A"	Type "B"	Type "C"
Diameter	mm	~ 320	~ 320	~ 320
Aeration diameter	mm	~ (300) 70	~ (300) 70	~ (300) 70
Perforation area	cm ²	~ 650	~ 650	~ 650
Weight	kg	~ 0.83	~ 0.83	~ 0.83
Buoyancy/units	N	~ 3	~ 3	~ 3
Slot pattern	–	fine	extra fine	fine
Airflow rate				
Minimum	Nm ³ /h	~ (0) 1.0	~ (0) 1.2	~ (0) 1.5
Nominal operation	Nm ³ /h	~ 8	~ 6	~ 10
Maximum	Nm ³ /h	~ 10	~ 8	~ 12
Flushing/ regeneration	Nm ³ /h	~ 14	~ 12	~ 16

Installation

Fixation and installation

The Wilo-Sevio ELASTOX®-D disc diffusers are connected to the pi-ping system via a sleeve connection G1"i integrated into the supporting structure.

The floor distributor systems (aeration grids) can be configured as square, rectangular and round pipes.

Mounting the diffusers on the aeration grids is a very straightforward and time-saving process. This can be carried out by one person without the use of specialised tools.

The structural design of the diffusers is devised such that replaceability with disc diffusers from other manufacturers is generally assured.

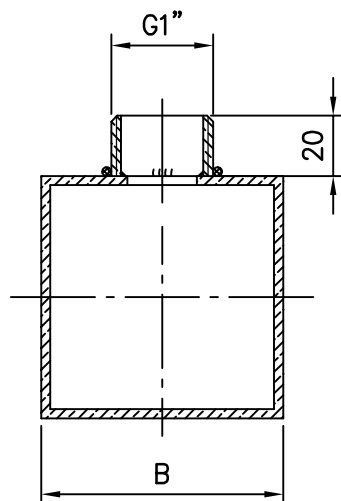
The GVA saddle clamp is produced from fibreglass-reinforced polypropylene and is equally suitable for installing on stainless steel or plastic round pipes with nominal diameters DN 65, 80 and 100.

Characteristics of round pipe (outer diameter = D)

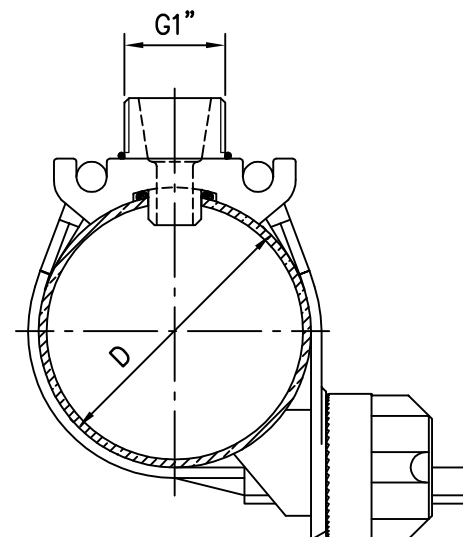
Nominal diameter	Plastic	Stainless steel
DN 65	75 mm	76.1 mm
DN 80	90 mm	88.9 mm
DN 100	110 mm	114.3 mm

Dimension drawing

Disc diffuser Wilo-Sevio ELASTOX®-D – square/rectangular



Disc diffuser Wilo-Sevio ELASTOX®-D – round tube



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Wilo-Sevio ELASTOX®-D

Consulting guide

Oxygen transfer rate

The oxygen utilisation of the Wilo-Sevio ELASTOX®-D disc diffusers has been optimised over numerous pilot-based trials and verified in practice through substantiating measurements. The result is a diffuser which features outstanding fine-bubble aeration properties.

The specific standard oxygen transfer rate SSOTR $\text{g O}_2/(\text{m}^3 \text{ m})$ and the standard oxygen transfer rate SOTR $\text{kg O}_2/\text{h}$, apart from the general aeration concept,

- surface aeration
- aeration with separate circulation, e.g. oblique flow aeration
- partial surface aeration, line aeration (spiral flow)

among other things, very strongly also depend on the activation density in the aeration basin under consideration.

The following illustrations of oxygen utilisation are based on area aeration in pure water under standard conditions at a blow-in depth of 3.75 m.

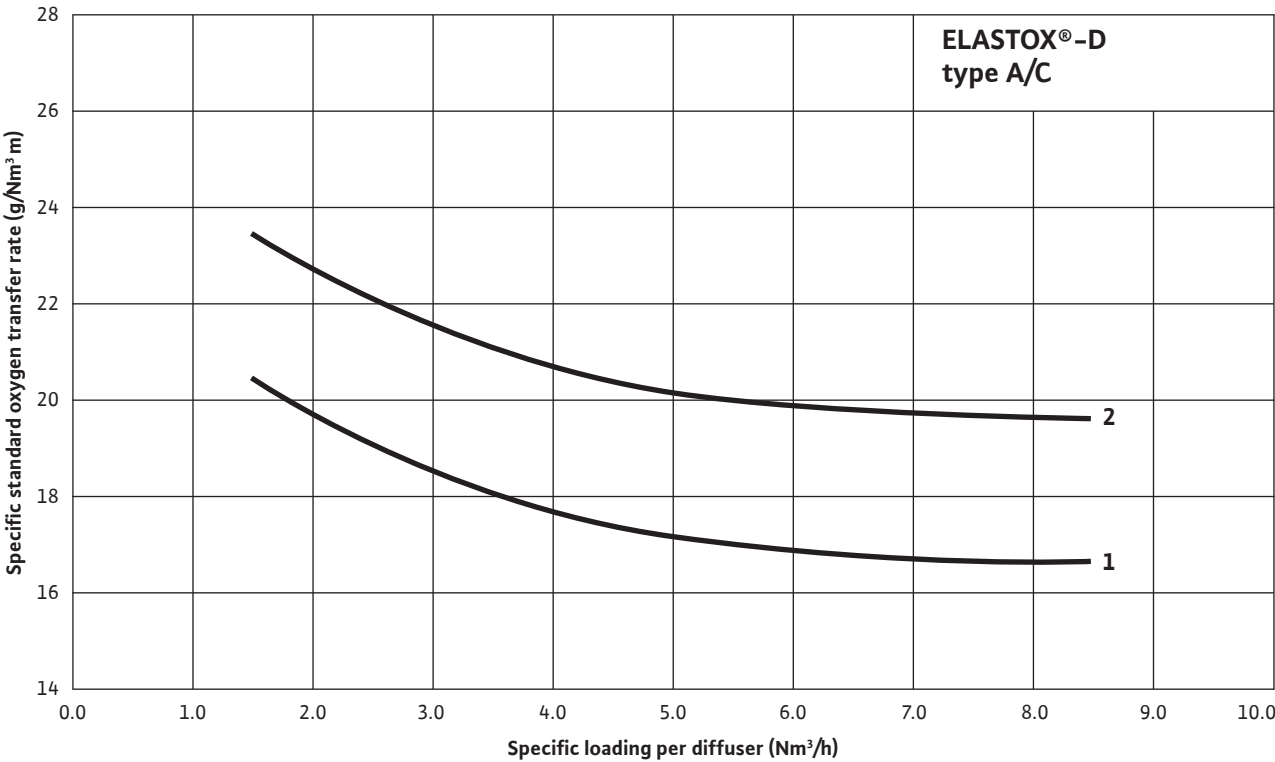
To determine the magnitude of influence of the activation density, the number of disc diffusers was varied:

- 1 = axial spacing 1.0 ~ 6.5 % or 1 element(s) per m^2
- 2 = axial spacing 0.5 ~ 26.0 % or 4 element(s) per m^2

Uniform arrangement on the bottom of the basin where a ratio between air transfer depth and diffuser spacing should not fall far below ~ 4:1 in order to prevent cylindrical water flows from forming by rising air bubbles.

Disc diffuser Wilo-Sevio ELASTOX®-D (type A/C) duty chart

specific standard oxygen transfer rate in pure water, Wilo-Sevio ELASTOX®-D type A and type C

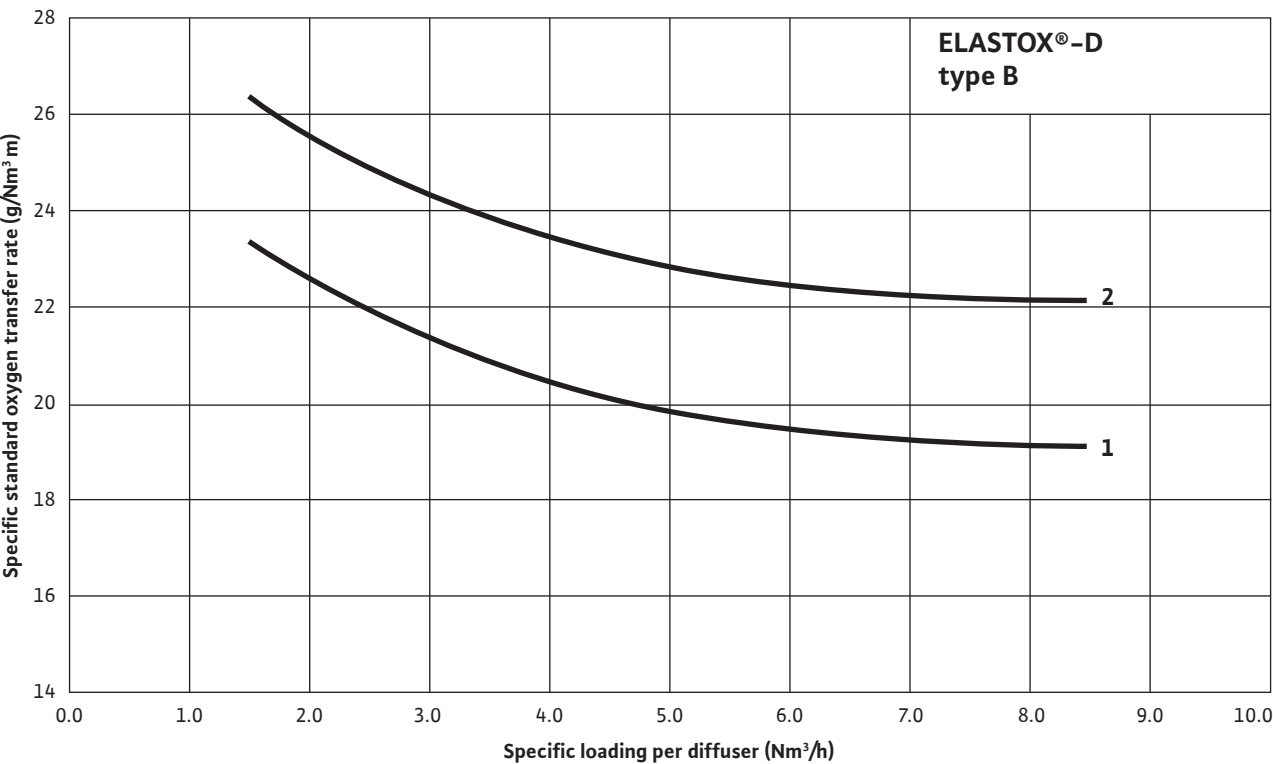


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Wilo-Sevio ELASTOX®-D (type B) disc diffuser duty chart

specific standard oxygen transfer rate in pure water, Wilo-Sevio ELASTOX®-D type B



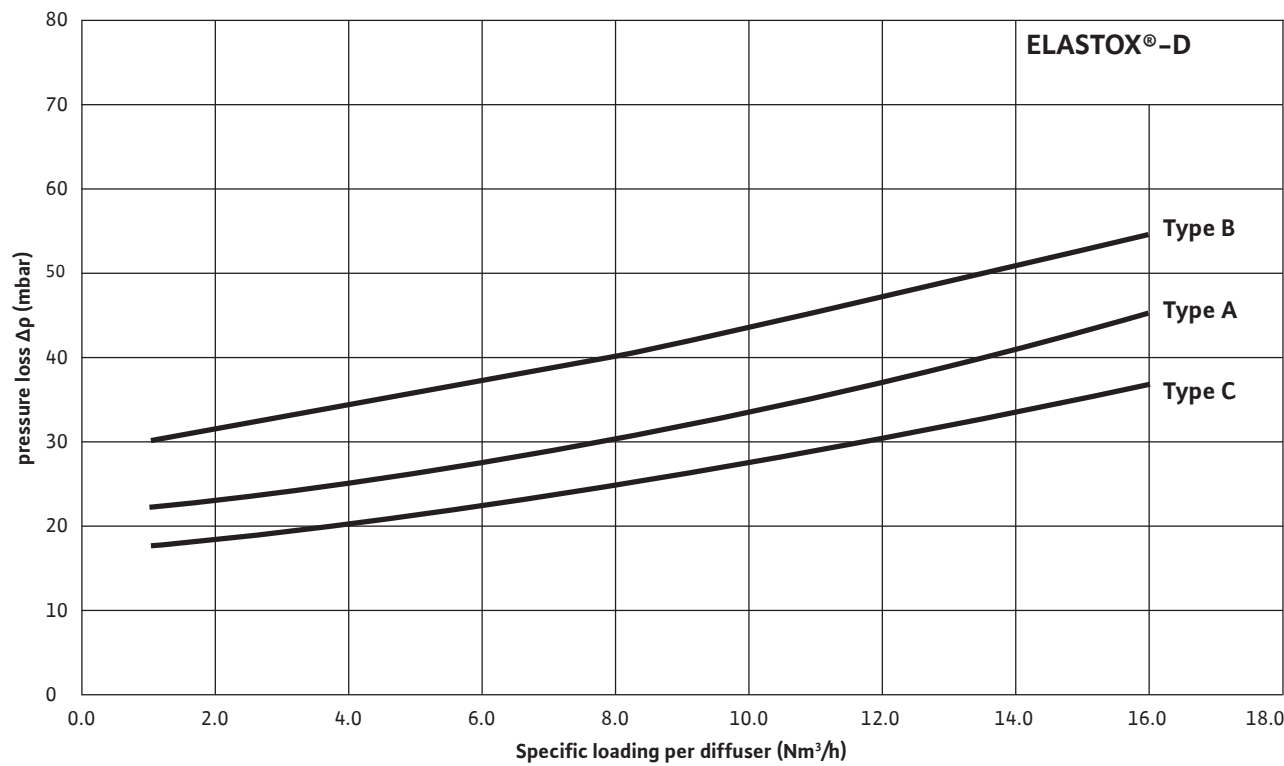
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Pressure loss

Wilo–Sevio ELASTOX®–D disc diffusers are distinguished by their elasticity, featuring very low base pressure losses and a shallow arched pressure loss curve, compared to rigid aeration bodies. This leads to improved economy and overall efficiency of the system.

The following specifications relate to all diaphragm quali- ties produced from EPDM and were determined in pure water at a blow–in depth of 3.75 m. The base pressure loss of silicon diaphragms in their new condition is marginally higher, although it has a notably lower increase over its operating period.

Wilo–Sevio ELASTOX®–D disc diffuser duty chart



Sewage treatment

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Pioneering for You

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