



Biogest International GmbH Wastewater Treatment Systems

represented in

Dresden, Munich, Bulgaria, Croatia, Poland



Our Office in Dresden (Germany)

Biogest International GmbH

is specialized for **engineering of wastewater treatment plants** for smaller projects like villages, holiday compounds, hotel areas, military installation, commercial centers and similar facilities.



Our Basic Products

are installations for wastewater treatment plants, which are produced under the trade mark **BSK®** like

- **Surface aerators**
- **Decanting systems (for SB-reactors)**
- **Floating systems (for SB-reactors)**
- **Control centers (PLC with Fuzzy-Logic)**



Moreover, we are engineering-partner of the German company **INVENT AG**. Consequently, the range of our products is also including the **innovative, world-wide patented HyperClassic-Technology**.

This presentation is focused to the

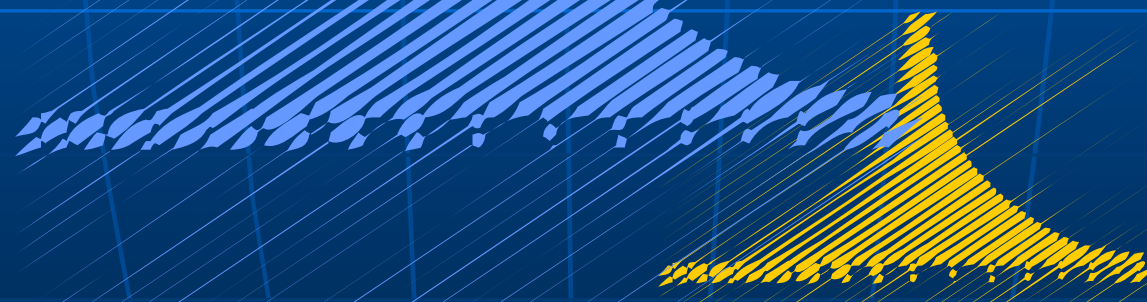
HYPERCLASSIC-TECHNOLOGY

which was invented by the German university Nuremberg. Years of experience and improvements are the basis for an outstanding technology for **mixing and aeration**, which could be offered for wastewater treatment plants. Hundreds of worldwide operating installations are the proof for the impressive feature at the highest competitive level.

INNOVATIVE HYPERCLASSIC-TECHNOLOGY

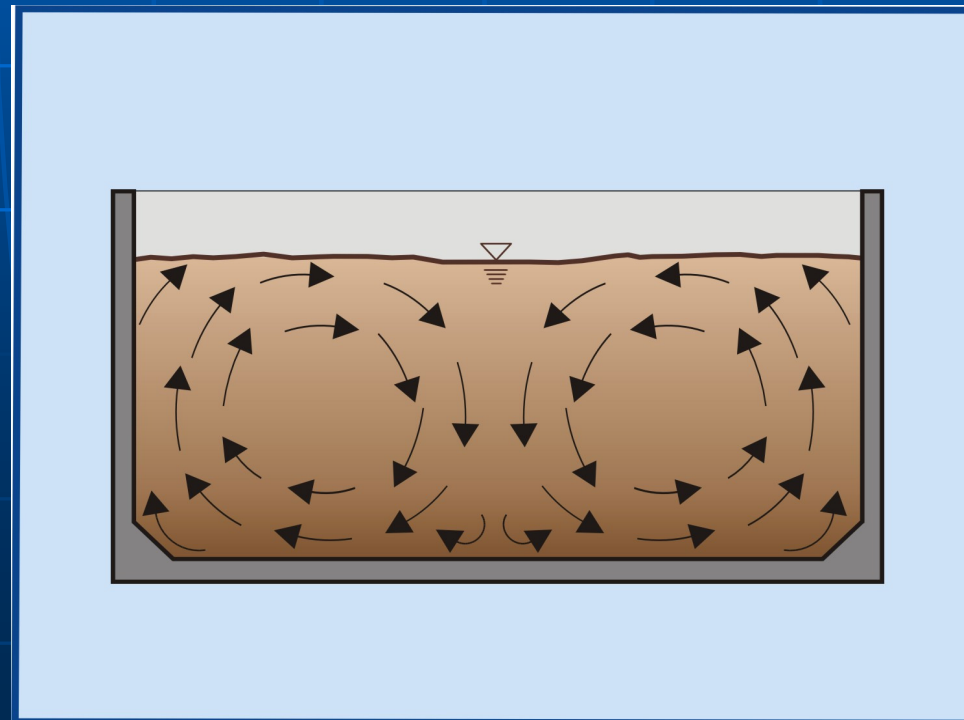
Mixing and Oxygen Supply

are the key processes of biological treatment of wastewater. If both are not performed properly, technical, economical and process problems are unavoidable.



INNOVATIVE HYPERCLASSIC-TECHNOLOGY

Let's Start with **Mixing** of Wastewater and Sludge



INNOVATIVE HYPERCLASSIC MIXERS

Targets of Mixing

- Homogenization of suspensions
- Equal concentrations
- No settling of solids or flakes
- High mixing rate
- Low energy consumption

INNOVATIVE HYPERCLASSIC MIXERS

Traditional Systems for Mixing

→ High speed submersed stirrers



→ Low speed submersed propeller mixers



INNOVATIVE HYPERCLASSIC MIXERS

Disadvantages of Traditional Systems

- High energy requirement**
- Wear parts below water**
- No homogenous mixing profile**
- Settling zones (dead zones) possible**
- High maintenance frequency**

INNOVATIVE HYPERCLASSIC MIXERS

The Solution:

HyperClassic Mixers



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

- Completely **different shape** of the mixing body



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

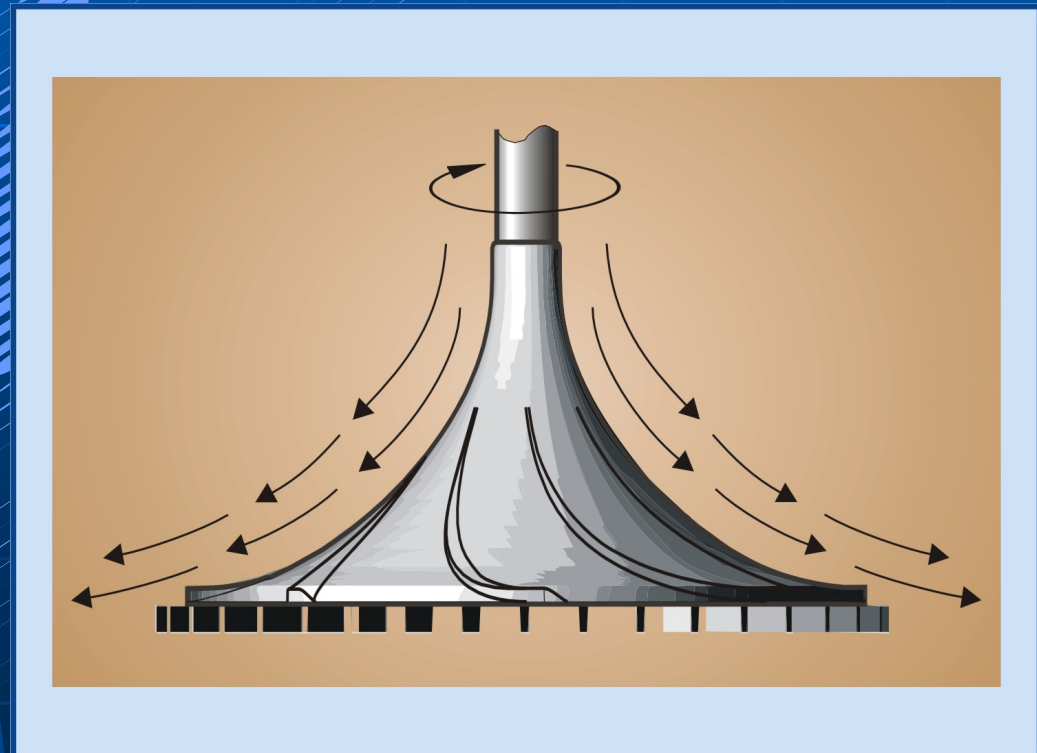
- Acceleration of liquid by **specifically formed transport ribs** (patented item)



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

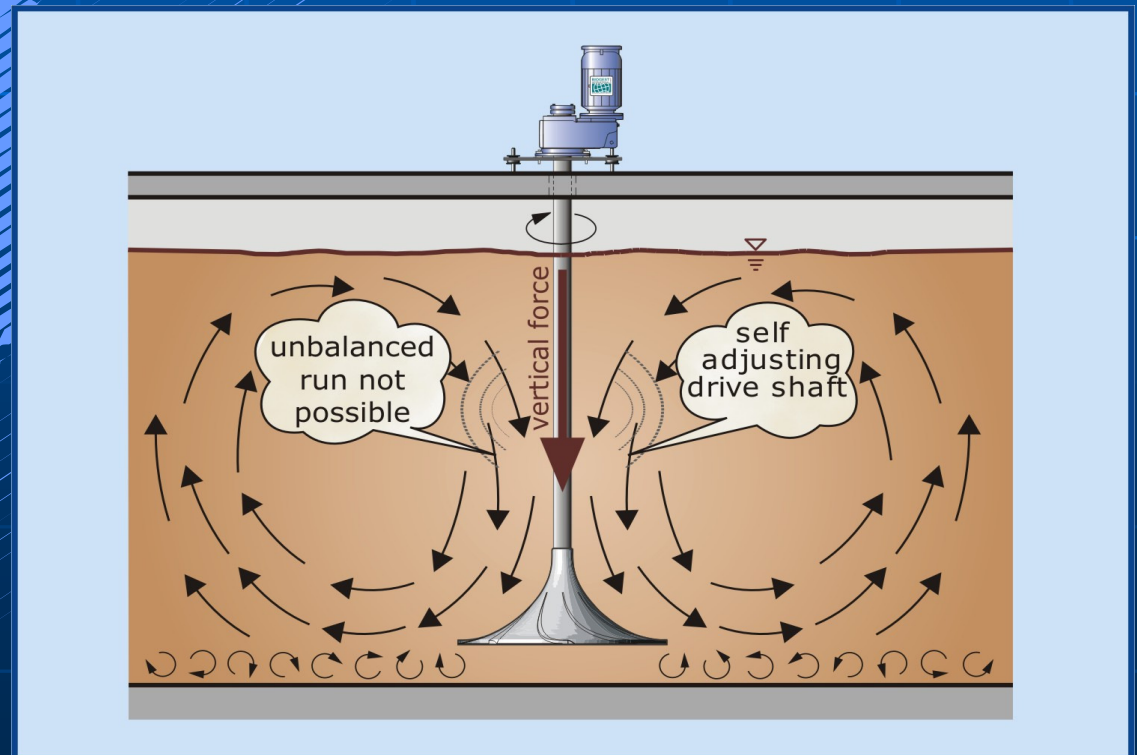
- Low speed and “soft” energy input **do not destroy flakes** (in contrary to high speed submersed mixers)



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

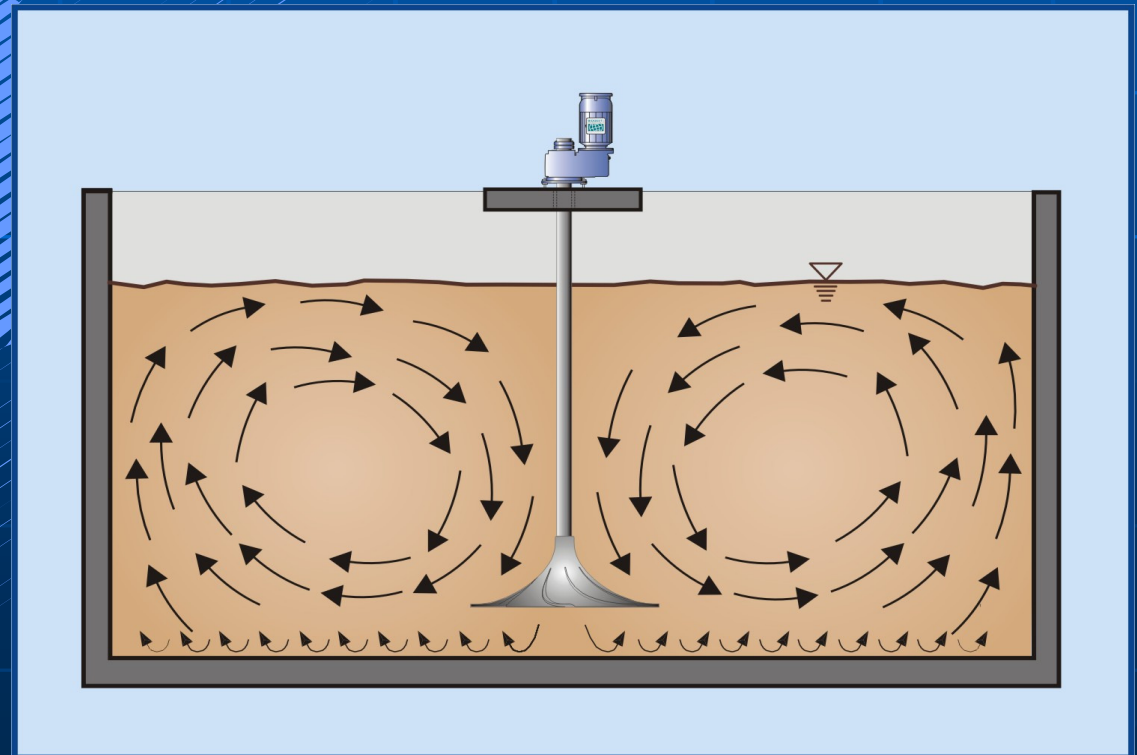
- Self-adjusting drive shaft **prevents unbalanced operation** (fibres are not able to stick at the mixing body)



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

- Central installation guarantees **symmetric mixing profile** without “dead zones”. Perfect conditions for processes, which require homogenous conditions.



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

- Dry mounted motor drive for **easy service** and maintenance



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

- **Low specific energy consumption**
(standard energy density: 2 W/m^3)



INNOVATIVE HYPERCLASSIC MIXERS

Characteristics and Features of HyperClassic Mixers

- Wear and service parts are **not at submersed position**. No pull-up of heavy machinery for maintenance.



INNOVATIVE HYPERCLASSIC MIXERS

Typical Project Examples

Example No. 01:

Denitrification basin of WWTP
“Berlin – Schoenerlinde”

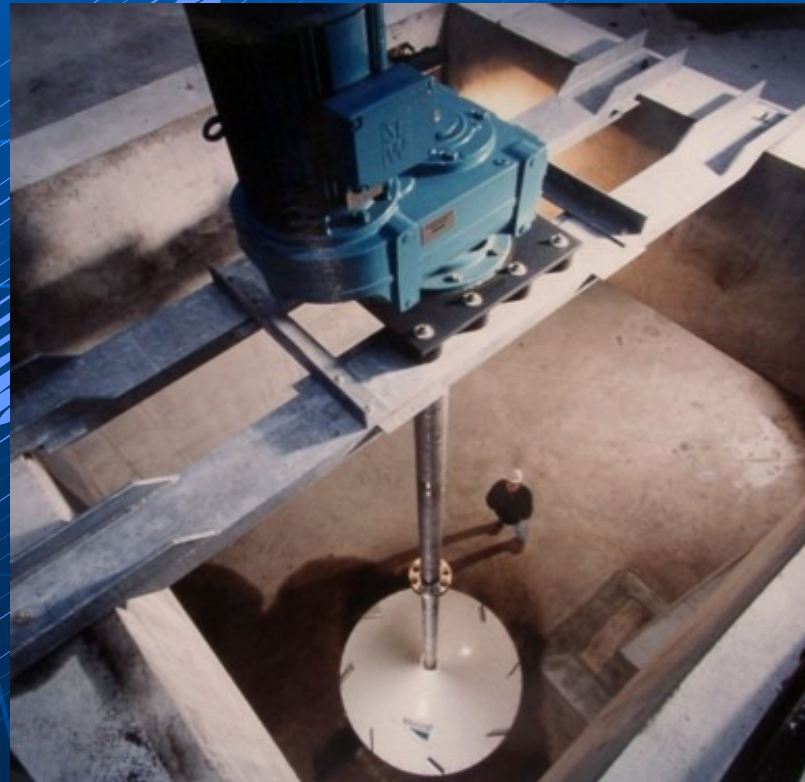


INNOVATIVE HYPERCLASSIC MIXERS

Typical Project Examples

Example No. 02:

Inlet **Equalization Tank** of a Brewery



INNOVATIVE HYPERCLASSIC MIXERS

Typical Project Examples

Example No. 03:

Mixing of pre-thickened sludge prior to dewatering



INNOVATIVE HYPERCLASSIC MIXERS

Typical Project Examples

Example No. 04:

SBR-Tank with Central Mixer for Denitrification
(Huludao – China)



INNOVATIVE HYPERCLASSIC AERATION

After explaining the HyperClassic-mixers
we would like to introduce the

HYPERCLASSIC-AERATION TECHNOLOGY

representing an outstanding **alternative** to conventional aeration systems like surface aerators, fine bubble membrane systems and injectors

INNOVATIVE HYPERCLASSIC AERATION

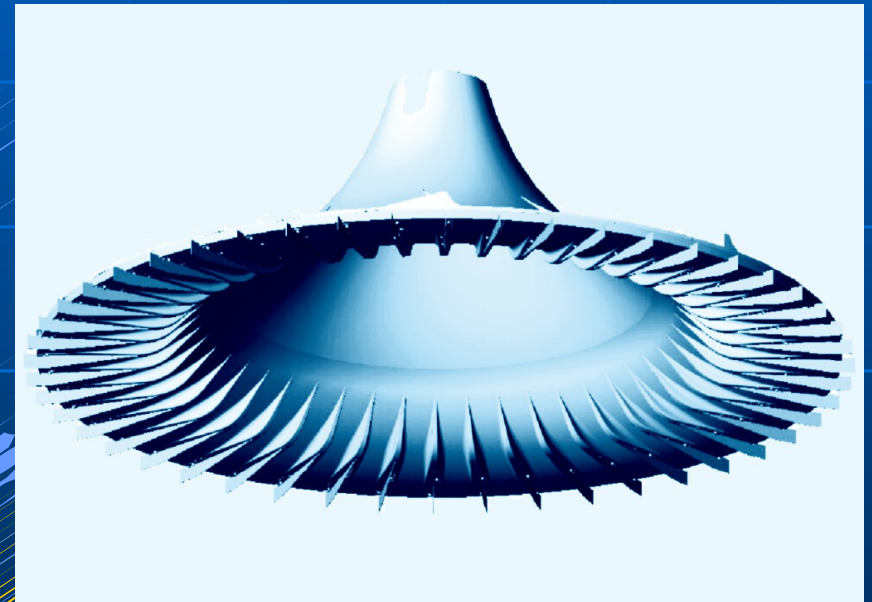
Key Targets of the System

- a) Oxygen input at a high efficiency level
- b) Production of fine bubbles *without* use of sensitive membranes
- c) Simultaneous mixing of the aerated liquid
- d) Constant distribution of fine bubbles as far as possible
- e) Wearless and submersed installations
- f) Easy maintenance and service

INNOVATIVE HYPERCLASSIC AERATION

The Basic Idea

- Rotating HyperClassic-stirrer equipped with plenty of shear ribs
- Diffusion of coarse air bubbles to micro-bubbles by *mechanical shredding*

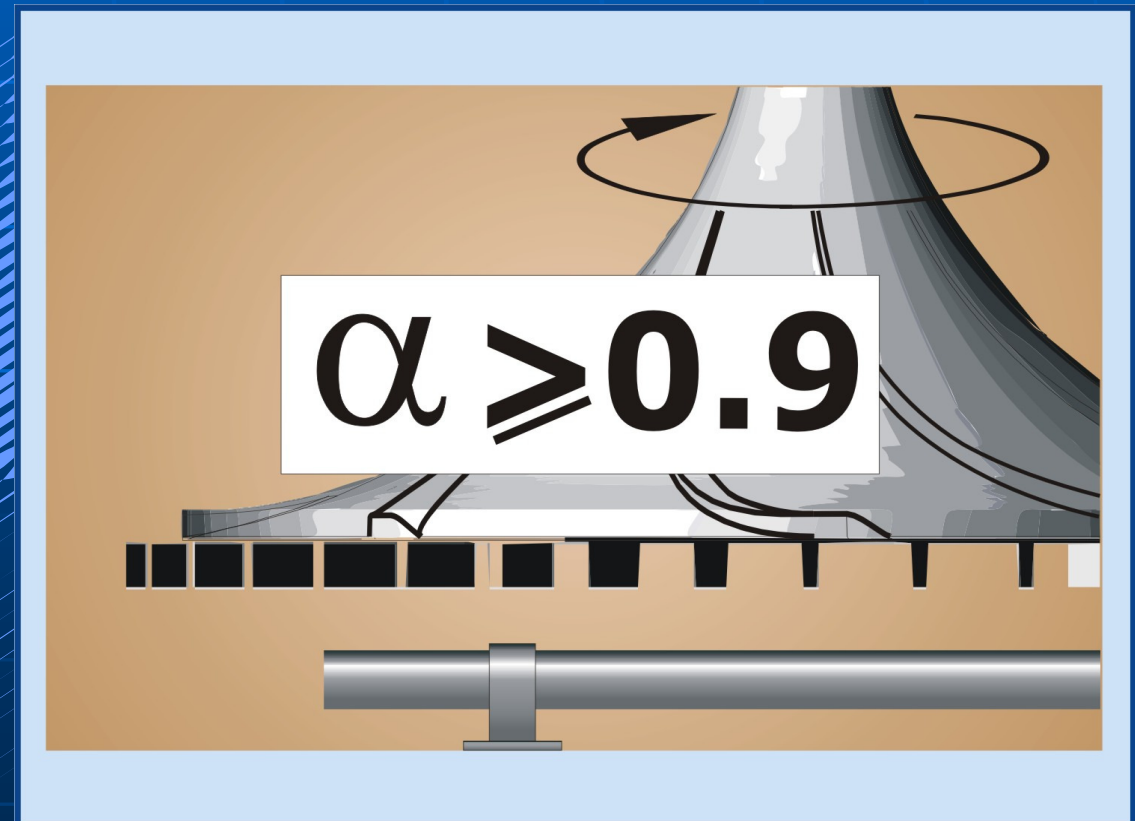


INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 1

The alpha-value is high and ranges between 0.85 and 0.95. Compared with the oxygen input capacity under standard conditions, the O₂-transfer is reduced by not more than max. 15 % (membrane systems: 40 – 50 %)

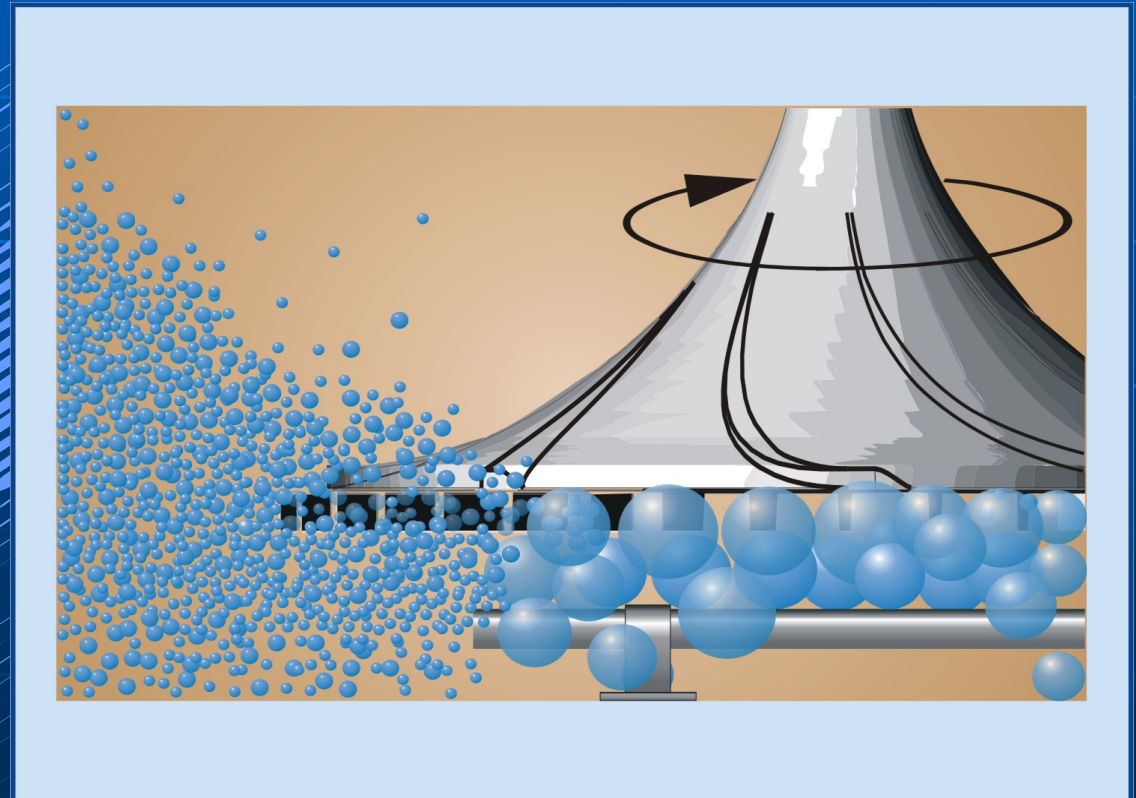


INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 2

No clogging possible due to coarse bubble air input and production of micro-bubbles by mechanical shredding (and not by sliced membranes)

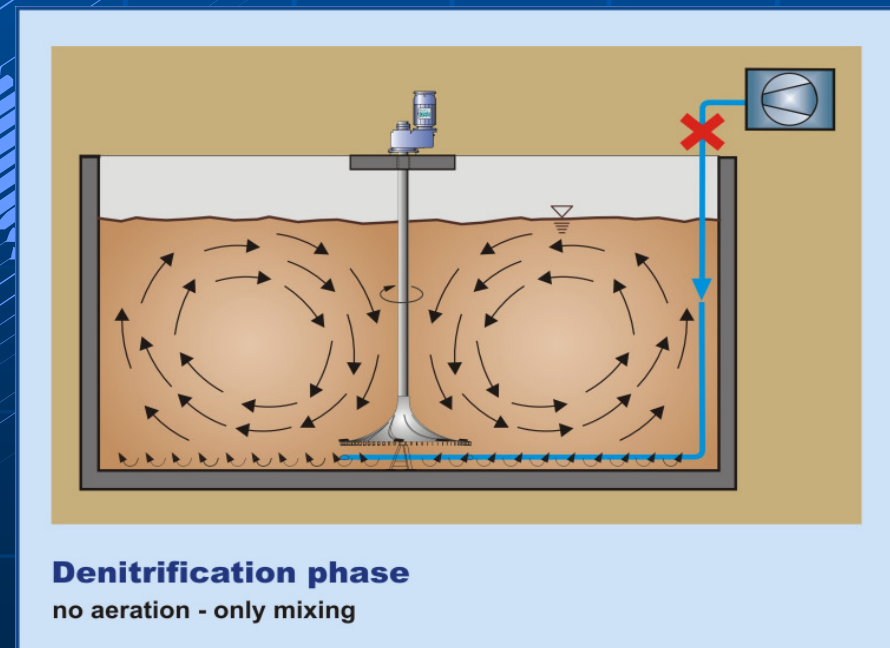
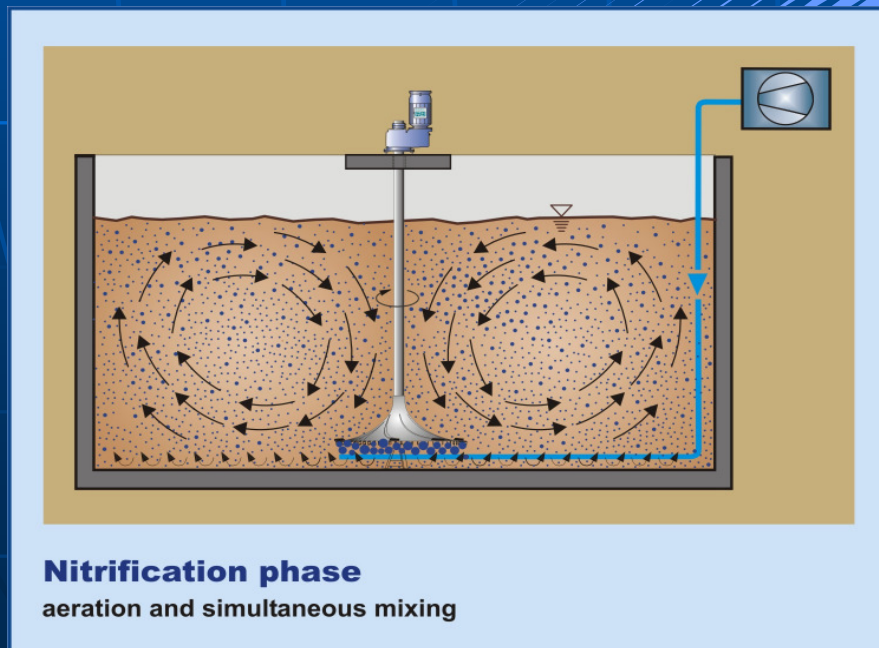


INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 3

Mixing and aeration by use of only one system. Perfect conditions for nitrification and denitrification within one biological reactor



INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 4

Easy access to the only service part of the HyperClassic-aerator (dry mounted, robust gear drive)



INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 5

Adjustable speed
(frequency converter) for
optimization of the
process and for
economical operation



INNOVATIVE HYPERCLASSIC AERATION

Most Important Advantages

Advantage No. 6

Adjustment of the blower capacity (frequency converter) in order to match the O₂-requirements of the process



INNOVATIVE HYPERCLASSIC AERATION

Different Sizes for Different Projects

- Stirrer diameters are available between 1.0 m and 2.5 m
- Oxygen input capacity of one aerator up to 150 kgO₂/h



INNOVATIVE HYPERCLASSIC AERATION

Application Examples

Example No. 01

SBR-WWTP operating at the Black Sea coast of Bulgaria (60,000 p.e.), totally 12 HyperClassic-aerators are operating



INNOVATIVE HYPERCLASSIC AERATION

Application Examples

Example No. 02

WWTP of a large brewery in Belgium operating since 8 years for the full satisfaction of our client



INNOVATIVE HYPERCLASSIC AERATION

Application Examples

Example No. 03

WWTP of the University of
Tetovo (Macedonia),
operating with one SB-
reactor (batch operation)
equipped with one
HyperClassic-aerator



INNOVATIVE HYPERCLASSIC AERATION

Application Examples

Example No. 04

WWTP of a yeast factory in Ukraine operating since 2 years for the full satisfaction of our client



INNOVATIVE HYPERCLASSIC-TECHNOLOGY

Final Remarks

We hope that our presentation could explain the special features of the **HyperClassic-Technology** for mixing and aeration in wastewater treatment plants.

It would be a pleasure for us to receive your enquiries for application.

CONTACT / IMPRINT



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