

# iCBA<sup>®</sup> - Aeration System

aeration technology



invent

umwelt und verfahrenstechnik

- Fluid mechanically optimized
- Ideal for moving bed reactors
- Robust construction
- Simple installation
- Maintenance-free



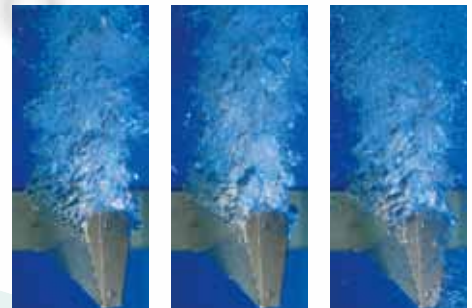
*i n n o v a t i o n f o r n a t u r e*

*The growing pollution of our environment is a problem which concerns all of us. For years water pollution, in particular, has continued to grow in threatening proportions. Water is turning into a more and more limited resource. As a consequence, forward-looking technologies are desperately needed for water and wastewater treatment.*

*With great commitment **INVENT** is dedicated to the development and implementation of such technologies, thus creating powerful products which contribute greatly to the preservation of the water quality of our groundwater, rivers and lakes.*

*The protection, the preservation and, where necessary, the restoration of our environment will remain one of the most important tasks of our society in the future.*

**INVENT** *takes on responsibility in this field, with innovative environmental and process engineering.*



**iCBA®**

## The Robust Aeration System

**INVENT** develops, produces and globally implements innovative machines, plants and processes for the treatment of water and wastewater.

In water and wastewater treatment several process engineering cleaning and processing steps are always applied. In combination they merge to a complete plant. One distinguishes between physical, physical/chemical and biological processes. The biological stage represents the heart of the plants. Here carbon and nitrogen compounds are biologically decomposed. The basis for this process is the effective mixing and the efficient transfer of oxygen, so that the biologically active bacteria can work effectively.

**INVENT** has specialized in exactly this field and, with its innovative products, is one of the world leaders in the area of mixing and aeration technology for the water and wastewater treatment.

**iCBA® –  
Efficient and durable**



*iCBA® aeration system in an industrial purification plant in Sweden (paper industry)*

The **INVENT Coarse Bubble Aeration System (iCBA®)** described in this brochure has been specially developed and optimized for demanding applications in industrial and municipal wastewater treatment plants. It provides an efficient oxygen supply and optimal mixing during the biological phase. In comparison with conventional membrane systems, it offers the following advantages:

- It was specially developed for use in so-called Attached Growth or Moving Bed Reactor processes. It is absolutely free of clogging.

- Its robust stainless steel construction make it ideal for the most aggressive industrial applications. The operational limits of conventional membrane aerators, such as high air temperatures or problematic wastewater ingredients, do not present a problem for the **iCBA®** aeration system.
- Even after many years' service, the aeration performance does not diminish. Pressure loss in the system remains minimal.
- The system can be installed simply and quickly.

## An Overview

### The Task

Normally, fine-bubble pressure aerators such as e. g. **E-FLEX®** are used for the conventional activated sludge treatment. There are, however, applications and process variants where a fine-bubble distribution of air is not useful, or where, considering energetic or maintenance-related aspects, a coarse-bubble aeration must be given the preference.

The **INVENT Coarse Bubble Aeration System (iCBA®)** was developed especially for applications and requirements such as e.g.:

- For the aeration in tanks with carrier media, such as fixed-bed or contact bed reactors. Here, oxygen transport procedures are not defined by the size of the air bubbles, but by the nature and proportional volume of the carrier media and their specific surface and wettability.
- Aeration in very deep tanks. Large water depths often limit the area of application of many membrane aeration systems due to high air temperatures. At the same time, with increasing depth, fine-bubble systems lose the energetic advantages compared to coarse-bubble systems.
- Aeration in highly viscous media, such as sludge tanks. Sewage sludge with a high percentage of solids possess at the same time a viscosity which is many times higher than that of activated sludge from the biological process stage. With a changing viscosity the coalescence behaviour of the medium also changes. At this point a fine-bubble aeration has no advantages whatsoever compared to coarse-bubble aeration systems. The **iCBA®** system is the perfect, energy-efficient alternative in the stabilization operation or in order to avoid odours in consolidated sludge.
- If the application of membrane materials is impossible, because of the medium characteristics, e.g. high temperature processes or gas input to aggressive media.
- If a system is required which should continue to operate for many years after its installation, without additional maintenance work.



### The Solution

The **iCBA®** aeration system consists of the **iCBA®** aeration element and the bottom distributor, on which the individual **iCBA®** aeration elements are mounted at regular distances. This type of group is known as an aeration grid. As a rule, the bottom of the tank is equipped with several aeration grids.

Air is supplied to the aeration grids by means of a central air supply pipe that is installed on the bottom of the tank, above the distributor pipes. This installation is carried out by the customer, as is the downpipe on the wall of the tank. The limit of supply thus lies effectively between the air supply pipe and the bottom distributor.

**Robust and environmentally friendly**



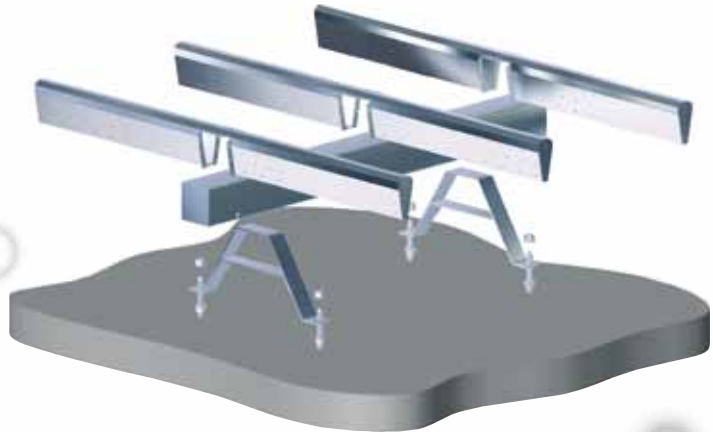
*iCBA® aeration system during clearwater test in an industrial purification plant in France (dairy industry)*

The **iCBA®** aeration element consists of a specially designed stainless-steel hollow body with optimized air-exit openings. The bottom distributor, made of rectangular-section stainless-steel pipe, serves as a base onto which the **iCBA®** aeration element is attached with a saddle connection.

### The Materials

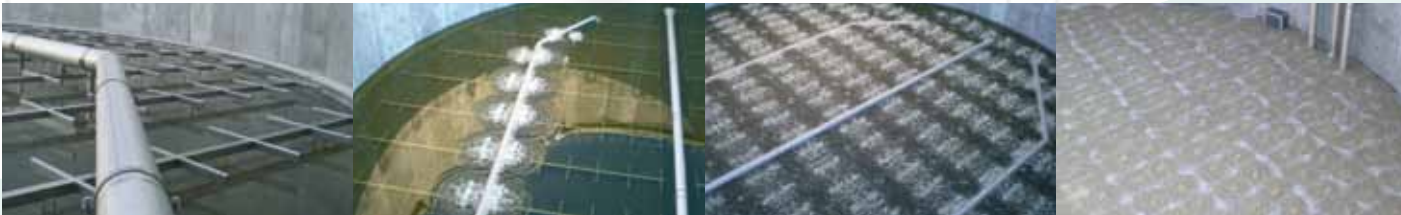
Because of the high demands on durability, robustness and low maintenance, and the requirement for quick and simple installation, we have selected materials that fulfil all the expectations of modern wastewater treatment, even under the most adverse conditions

Without exception, all components of the **iCBA®** aeration system are made of high-grade stainless steel that conforms to (ASTM 304) or (ASTM 316).



*Exploded view of 3 iCBA® aeration elements, with the air distributor and bottom mounting*

*Various iCBA® aeration systems assembled and during operation*



**iCBA®**  
Constructions

Construction of the  
**iCBA®-system**

**iCBA®**

**Simple and quick**

## Installation and operation

### Installation

The **iCBA®** aeration elements are supplied separately from the bottom distributor and the fittings. The first step of the installation is to fix the bottom distributors to the bottom of the tank with the aid of the supplied mountings. Care must be taken to ensure that the mountings are exactly leveled. Then the **iCBA®** aeration elements are simply fitted to the designated points on the distributor pipes and tightened.

When these steps have been completed and the alignment has been carefully checked, the bottom distributors are connected to the customer's air supply. This connection can by arrangement be either a simple welded connection or a pipe coupling.

### Operation

Operation of the **iCBA®** aeration system requires no special precautions. Maintenance work and cleaning of the aerator are not normally necessary.

If the **iCBA®** aeration element is fitted with two separate air supply pipes, an unequal quantity of air in the two lines can modulate the circulation of any biocarriers that are in use.

**Safe and  
maintenance-free**

*iCBA® aeration system in operation in an industrial purification plant in France (dairy industry)*



*From top to bottom:*

*a) iCBA® aeration system during installation*

*b) iCBA® aeration system after assembly work has been completed*



## Our Service

Do you have an application for the **iCBA®** aeration system?

Ask us about it. Our **INVENT** team takes care of all tasks from the dimensioning, the engineering, the installation right through to the commissioning and the service – problem-free for you.

We also offer customer-specific special solutions for the optimization of your aeration, for example by applying **GPS-X**, the leading software package worldwide for the dynamic simulation of wastewater treatment plants and plant components.

We also carry out oxygen input measurements for you in accordance with all current rules and regulations.

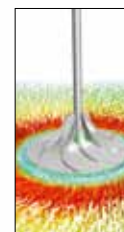
## Professional and innovative

### Further Products and Services

**INVENT** is the market leader for mixers, mixing and aeration systems and membrane aeration systems for the water and wastewater treatment. If required please ask for information about our other lines of products.

We are also happy to offer you complete system solutions for your plants, such as a carefully laid-out and adapted mechanical equipment packages. We simulate and optimize your plant with the help of appropriate software packages or we optimize your plant or building in terms of fluid mechanics.

We are your competent partner for all questions in the field of water and wastewater treatment.



*engineering & consulting*



*software-products*

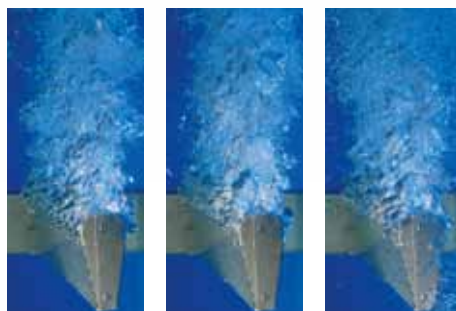


*research & development*

*mixing technology*



*system solutions*





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