

## System components for biological water treatment



Based on our innovative system components, we have succeeded in gaining international reputation as a specialist in waste water processing technology, which we continuously assure and extend. Our R&D department work with great innovation commitment to develop, and optimize, our own system components, which are partly patented, in conjunction with process technology and engineering techniques as well as adapt them to new development achievements and methods. In addition, we take into account, of course, the increasingly demanding customer requirements such as first-rate quality, reduced operating costs, serviceability and faster return on investment. For this purpose, GVA's after-sales service also offers corresponding services for plant inspections, machine maintenance, rehabilitation and optimization of equipment and components.

**ELASTOX® membrane air diffusers**  
– approved and field-tested in hundreds of installations.

Efficient and durable aeration equipment constitutes a basic requirement of well operating aeration systems. However, in order to always achieve optimum performance of each facility, long years of experience and appropriate know-how are necessary for furnishing the suitable components for projects in terms of process technology and the respective plant layout.

**Typical applications of ELASTOX® aeration systems are:**

- Preservation aeration of waste water e.g. in balancing tanks
- Oxygen entrainment in activation basins
- Oxygen entrainment for sludge stabilization
- Aeration of rivers and lakes
- Aeration of fish ponds
- CO<sub>2</sub> admission for neutralization

GVA aeration systems are already utilized on a global scale in hundreds of waste water treatment facilities. Being a specialist of fine-bubbling compressed-air aeration systems, we deliver not only components and process know-how, but our business operations also include plant planning and consultation for plant operators all over the world.

# ELASTOX® membrane air diffusers – appropriate technological concept for each technique

## GVA aeration systems for each process technology and any type of plant layout

ELASTOX® membrane air diffusers of GVA have enjoyed great reputation due to their high quality and stable performance as to compressed air aeration for over 20 years now. As early as in 1983, GVA introduced the newly developed ELASTOX®-R tube air diffuser which was the first of now three basic versions of ELASTOX® air diffusers. Its design advantages and positive properties of the ELASTOX®-R tube air diffuser in permanent operation triggered the development of numerous similar systems that are based on this design principle.

In 1984, the patented ELASTOX®-T disk air diffuser followed with its innovative lift limitation. It was developed by GVA in particular for optimizing the aeration process and excels by its ultimate quality and lifetime of the membranes.

In 1996, we introduced the ELASTOX®-P system at the IFAT, a completely novel plate air diffuser in design terms that represents a symbiosis of the design advantages of both membrane air diffusers. This third air diffuser version is the product of our long years of experience in manufacturing and applying aeration systems.

## ELASTOX®-R tube air diffuser – an idea conquers the world

The ELASTOX®-R tube air diffuser introduced by GVA on the market is one of the first membrane compressed-air aeration systems. Based on its superb properties, the ELASTOX®-R system rapidly became an often simulated plant component in waste water treatment technology:

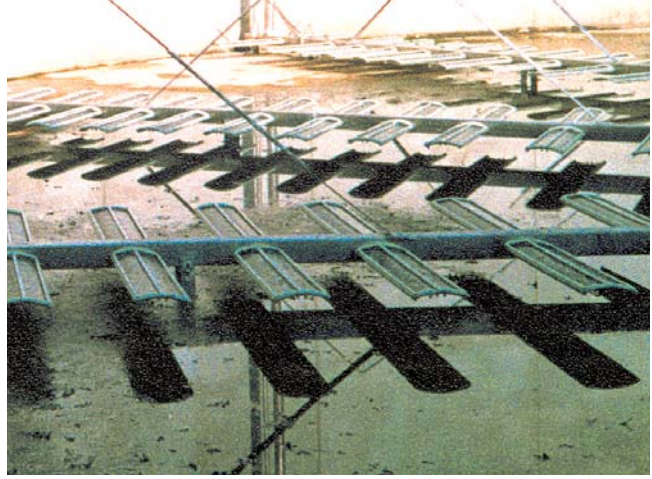
- Extremely low-buoyancy behavior due to floodable supporting tube
- Simple and fast mounting on aeration grids and dismantling;
- Ideal also in case of unsuitable basin dimensions
- Low piping requirement thanks to individual air diffuser lengths and arrangement in pairs

The ELASTOX®-R supporting body is composed of a continuous injection-molded element with integrated air feeding and a threaded bushing of high-grade steel for fastening purposes. All applied materials feature excellent resistivity against chemical and biochemical influences during the waste water treatment process.





The membranes of ELASTOX®-T disk air diffusers consist of a special composition rubber (EPDM) or special silicone that have already proved their worth in many facilities.



As a rule, the ELASTOX®-P plate air diffusers are attached in pairs to the aeration grids.

### ELASTOX®-T disk air diffusers – for optimum aeration

The ELASTOX®-T disk air diffusers with their upturned disk membrane ensure equally distributed aeration without coalescence. An essential feature is the patented central lift limitation preventing the membrane from swelling like a balloon and thus ensures uniform aeration across the entire air diffuser surface. Further advantages of ELASTOX®-T include the following:

- Excellent oxygen utilization with less pressure loss due to optimized perforation of the membranes
- Patented lift limitation with integrated spring-loaded check-valve
- High quality and long lifetime of membranes thanks to their production as molded articles
- Also ideal for retrofitting existing facilities, because area aeration can be performed regardless of the basin shape

ELASTOX®-T membrane air diffusers come in two model types. As far as the ELASTOX®-T standard model is concerned, the patented central lift limitation component is a constituent part of the membrane and simultaneously functions like a check valve. The ELASTOX®-T special model version offers still more operational safety. Here, the lift limitation component has been integrated by vulcanizing and, in addition, designed as a spring-loaded check valve which does not only ensure more safety in the intermittent operation mode, but also in case of damage, because the quantity of leaking air is instantaneously reduced by the restoring force of the spring if the membrane is defective.

### Plate air diffuser ELASTOX®-P – the new generation of aeration systems

We offer the plate air diffuser ELASTOX®-P belonging to the latest aeration equipment generation as a system component for waste water technology that incorporates our extensive know-how and long years of experience in manufacturing und operating waster water treatment equipment. As a result,

an aeration system has been achieved combining the advantages of the systems applied up to now:

- Low-buoyancy behavior
- Low piping requirement
- Optimum gas admission properties
- High oxygen utilization values
- Long lifetime
- Mounting compatible with ELASTOX®-R for more air admission.

The long lifetime of the ELASTOX®-P plate air diffuser membrane is based on the production of the air diffuser membrane as a molded article; the material excels by its higher quality features as compared with extrusion articles. What is more, thanks to the mostly upturned aeration surfaces, the plate air diffusers offer the process-technological advantages of disk air diffusers and are, in addition, specially suited for systems that have to be removed without emptying the basin.



The low-buoyancy ELASTOX®-R tube air diffusers operate according to the floodable supporting tube principle.

*Removable aeration field with ELASTOX®-T disk air diffusers*



*For effective aeration, all required properties must be taken into account, e.g. in terms of basin geometry and process technology.*

## GVA system components – up-to-date technologies

### **High-quality membrane properties – the essentials of secure compressed-air aeration**

The common term of rubber membrane in fact does not meet the complexity of the subject of material quality for the efficiency of compressed-air aerations systems. In this conjunction, a distinction has to be cut between communal and industrial waste water facilities due to the different composition of waste water.

In the communal sphere, elastomers made of EPDM (ethylene propylene diene termpolymer) have stood the test of time best of all. The material has permanently been optimized over the years and features high durability, excellent mechanical properties and a high degree of overall cost effectiveness. However, in spite of its reduced plasticizer content, EPDM shows a certain susceptibility to special substances contained in waste water, under certain conditions also to special microorganisms.

Today we have various advanced EPDM properties at our disposal, with even more reduced plasticizer content, or including a special additive making the material less susceptible to biological fouling.

A very good alternative material is silicone, which can be particularly applied in waste water treatment facilities in the industrial sphere, e.g. paper or food production, chemistry etc. This material is free of plasticizers and shows good to very good resistance against other “critical” substances contained in waste water. Thanks to its specially smooth surface, silicone is largely resistant against sedimentary deposits and fouling, and thin accumulated layers can easily be removed. Moreover, silicone is also suitable for application under high temperatures both of waste water and admitted air.

### **Process know-how – the total is more than the sum of its parts**

A tailor-made overall package is the underlying basis of an efficient plant solution. GVA's long years of experience in the manufacture, installation and maintenance of aeration and circulation technology guarantee plant operators an optimum combination of process technology and plant components with innovative detail solutions.

Thus, GVA has developed, e.g. a simply and quickly applicable submerged positioning and fastening system – GVA-UPB system in short – for removing aeration groups for maintenance purposes without having to lower the water level. Individual aeration grids can therefore be positioned and fastened under water in a secure and exact manner. In case of maintenance, the grid can be detached by an eccentric movement from its anchorage from the edge of the basin, and can easily be lifted by means of a guide device.