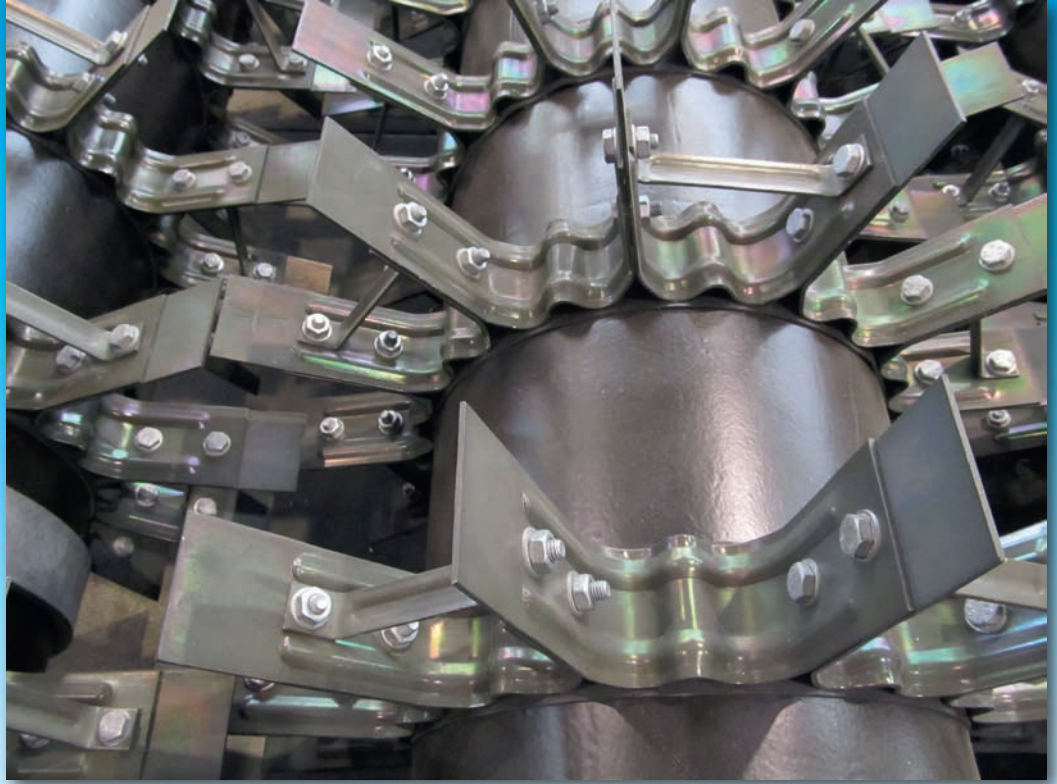
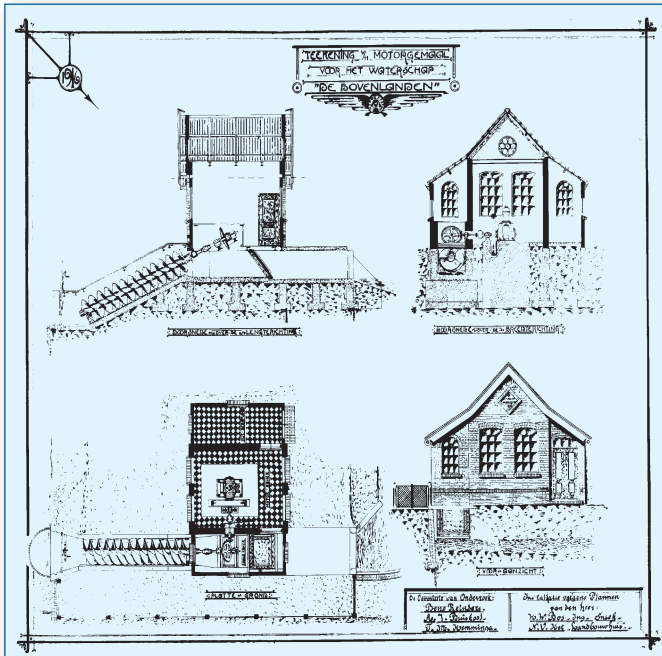


LANDY Brush Aerators



Landustrie 
SINCE 1913

LANDUSTRIE



OVER 100 YEARS OF HISTORY

- ✦ Landustrie celebrated its 100th anniversary in 2013.
- ✦ The company's foundations were laid in 1913, when Landustrie was active in the agricultural sector and the evolving field of polder drainage. Since the 1960s, Landustrie has developed into a global supplier of aeration technology. This includes LANDY brush aerators which are higher-efficiency descendants of the original cage rotor developed by TNO in 1959.
- ✦ Today, Landustrie is a state-of-the-art engineering company, combining time-proven products and techniques with modern innovation.

LANDY BRUSH AERATORS

Landustrie is a world-leading wastewater aeration solution provider, with extensive knowledge and experience, and an enviable track record. For over half a century Landustrie has designed, manufactured, supplied, installed and maintained fine bubble aeration systems and surface aeration systems, including low-speed surface aerators and brush aerators.

As a leading manufacturer of aeration systems, Landustrie has developed two brush aerator designs, the LANDY 700 and LANDY 1000, giving you greater choice for aeration, mixing and propulsion.



Landy brush aerator mounted underneath steel bridge

INTRODUCTION TO AERATION

Wastewater aeration is the process of introducing atmospheric oxygen (O₂) into wastewater to facilitate the aerobic bio-degradation of pollutants. The activated sludge process is the most common form of aerobic biological wastewater treatment. This popular process relies on aeration to promote the rapid reproduction of micro-organisms that break down organic matter in the wastewater. Aeration also raises dissolved oxygen levels in the final effluent which in turn helps sustain plant and animal life in the receiving rivers and lakes.

SUSTAINABLE SOLUTIONS

Landustrie's brush aerators have the highest possible aeration efficiency and a service life of up to 30 years, making them highly sustainable and low in energy consumption. This results in a reduced carbon footprint and the lowest possible total cost of ownership.

Landustrie can help you achieve a truly sustainable wastewater treatment process by combining many years of aeration engineering experience with professional project guidance. Landustrie specialists provide expertise from conceptual design through to commissioning and start-up, thus ensuring an environmentally friendly, sustainable and economically viable solution.

RESEARCH & DEVELOPMENT

Even though Landustrie manufacture the most durable and efficient brush aerators available today, we never rest. Landustrie has an in-house test laboratory where new concepts are developed into tried and proven products.

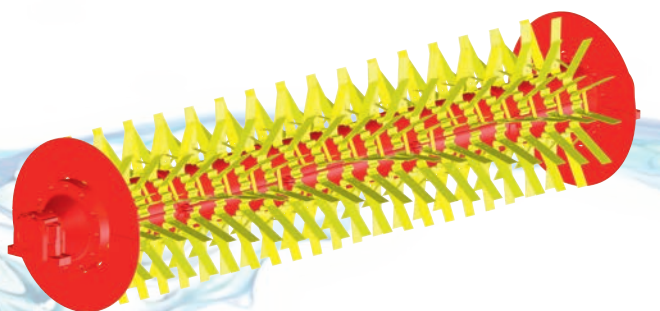
Not only is the LANDY 700 brush aerator an advance on the well-known cage rotor, but the LANDY 1000 is the higher-efficiency result of further research and extensive testing. You can rest assured that the LANDY brush aerator specified for your requirement will perform as expected - thanks to Landustrie's extensive knowledge, many years of experience, and rigorous in-house development and testing.

DESIGN

Landustrie's LANDY brush aerators operate more efficiently and cost effectively than similar products made by other manufacturers.

They consist of a seamless, hollow steel shaft onto which are clamped multiple star-shaped rotor blades. Each blade is offset from the previous blade to form a spiral pattern around the shaft. This reduces 'tramping' and undue bearing load as the aerator rotates in water, ensuring reduced noise and shock-free operation. The rotor blades are made of either hot dip galvanised steel, or AISI 304 or AISI 316 grade stainless steel. If required, LANDY brush aerators can be supplied with access platforms and/or inspection covers for ease of inspection and maintenance.

Our qualified engineers use ingenuity and creative engineering to tailor the conceptual design to your site-specific requirements. During the design process, Landustrie engineers use finite element analysis (FEA) software to calculate any stresses on the brush aerator and civil structures, thus ensuring a robust and reliable installation.



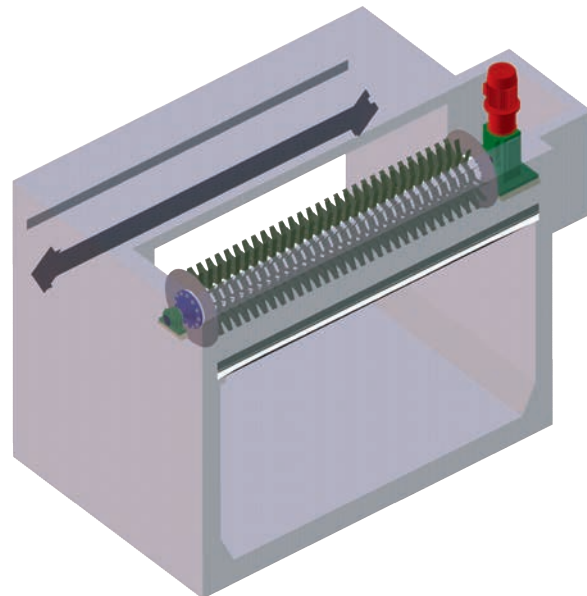
Landy brush aerator with vertical splash guards

LANDUSTRIE

MANUFACTURING

To maintain the highest quality standards, all LANDY brush aerators are manufactured at our factory in Sneek, The Netherlands. This 15000 m² state-of-the-art manufacturing facility is well-equipped with the latest technology and produces brush aerators with diameters of 700 mm and 1000 mm, in lengths of up to 9 m.

From metal forming and welding, to applying corrosion protective coatings and paint, and through to final assembly, each step of the manufacturing process takes place under our roof, and most importantly, under our quality control regime. Our capabilities include X-ray and ultrasonic tests to ensure that our brush aerators remain robust and reliable for decades to come. Landustrie has been awarded, and operates to, ISO 9001-2008 and SCC (Safety Checklist Contractor) certification standards.



3D view of typical Landy brush aerator arrangement



Brush aerator ready for transport

OPERATION

Brush aerators are horizontal shaft surface aerators used for oxygen transfer and directional mixing in wastewater treatment. The LANDY brush aerator's rotor introduces oxygen into the water by creating intensive turbulence at the phase boundary between the wastewater surface and the air. The rotor also induces a strong directional flow pattern to ensure thorough mixing of the activated sludge, wastewater and oxygen. This flow pattern allows sedimentation-free operation in basin depths of up to 3.5 m. In deeper basins of up to 8 m, mixing should be supplemented by additional flow inducers with an intermittent mode of operation.

Splash plates are mounted on either end of the rotor shaft to minimise splashing onto the bearings and drive unit. Guide baffles downstream of the brush aerator are often specified to ensure uniform aeration and mixing down to the tank floor and to maximise efficiency.

The scope of LANDY brush aerator projects can be tailored to your requirements. For example, the scope can include an access bridge and inspection covers to facilitate offsite pre-fabrication, quick and safe installation, and ease of inspection and maintenance.

CONSULTING ENGINEERS

Significant energy savings can be achieved when aerator operation is based on the actual load received by a treatment plant rather than on the original design parameters. It is very important that operational efficiency is optimised, as between 60% and 80% of the power consumption at a typical wastewater treatment works can be attributed to aeration.

At design stage, wastewater treatment process calculations are commonly based on the maximum predicted load to the plant plus an allowance for population growth in future years, and then further multiplied by a peaking factor and/or safety margin. Aeration system designs are then based on these predicted, and often inflated, figures. But what happens if the actual load is much lower than the predicted load, or if the population growth doesn't come about as first thought? By adjusting the aeration system operation to match the actual plant load, the aeration efficiency can be improved considerably. This allows for energy savings of up to 30%, resulting in a reduction of energy costs and of the carbon footprint.

Landustrie has developed software to compare the operation of brush aerators to the actual treatment plant load. This can be used to optimize the aeration process and improve efficiency and durability. Landustrie is an ideal partner for technical advice in view of achieving the highest operational efficiency.



STP Littleport, UK

APPLICATIONS

LANDY brush aerators are used worldwide. They are deployed in both municipal and industrial wastewater treatment plants, including those of the food, pharmaceutical and petrochemical industries. LANDY brush aerators can be installed in a number of different tank configurations including rectangular, square and round aeration tanks, sludge stabilization tanks, oxidation ditches, carousels, annulus tanks and equalization and buffer tanks.

Float-mounted LANDY brush aerators are also available, being suitable for use in sequencing batch reactors (SBRs), MBR systems, and treatment lagoons. The state-of-the-art float assembly consists of two parallel floats spanned by a robust platform, sized to suit the particular brush aerator model. Benefits of this compact design include good stability, easy 'trimming', and cost-effective packaging and transport. For a small license fee, the float assembly can be manufactured locally to the Landustrie design, thus saving on labour, packaging and transport costs.



Floating Landy brush aerator

LANDUSTRIE

AERATION EFFICIENCY

LANDY 700 and 1000 brush aerators have a guaranteed oxygenation efficiency. The oxygenation capacity depends largely on the rotor length, the immersion depth and the rotational speed. The table below shows the oxygenation capacity and oxygenation efficiency (SAE) of the LANDY 700 and 1000 at the maximum rotor length of 9 m, maximum immersion depth of 300 mm and rotational speed of 72 rpm.

Both options are available in rotor lengths to suit your site requirements, up to a maximum length of 9 m.

Version	Diameter (mm)	Rotor Length (mm)	Oxygenation Capacity (kg O ₂ / hr)	Oxygenation Efficiency (kg O ₂ / hr)
LANDY 700	700	9000	54	1,8
LANDY 1000	1000	9000	85	2,0

LOW NOISE

All designs of brush aerator generate sound, both from the mechanical drive (~20%) and from the interaction of the blades in the water (~80%). If noise restrictions apply, Landy brush aerators can be supplied with noise suppression covers and splash reducers.



Landy brush aerator with splash cover

AERATION CONTROL

Oxygenation capacity and mixing power can be controlled by varying the water level (and therefore the immersion depth of the aerator) and/or by adjusting the speed of rotation. The water level and immersion depth of the aerator can be controlled by manual or automatic adjustment of the outlet weir height. Variable Frequency Drives (VFDs) are a common method of adjusting the speed of rotation.

By matching operation to demand, energy efficiency and treatment performance can be optimized.

SIMPLE AND ROBUST

Landustrie utilize finite element analysis (FEA) software to achieve a simple and robust construction without over-engineering. For example, FEA allows the aerator blades to be manufactured from the optimum gauge for each different grade of steel. LANDY brush aerators are industry leaders in build quality; this is clearly manifested by their superior reliability and longevity. Gearboxes are typically designed with a service factor of ≥ 2.0 , which well exceeds most specifications and alternative designs.

LANDY brush aerators are provided with long-life bearings which reduce the maintenance frequency and achieve operational savings.

EXPERIENCE

Landustrie has been involved in aeration technology for more than half a century and in more than 60 countries worldwide. This has given Landustrie a wealth of knowledge and experience, and the capability to design robust, efficient and optimized aeration systems. Landustrie's experience extends from single 3 kW aeration rotors to large scale projects with 8 or more 45kW aeration rotors.

INSTALLATION AND COMMISSIONING

Landustrie engineers are renowned for their quality workmanship. Even in challenging conditions, our installation teams deliver the desired outcomes within tight timeframes.

If your preference is to use in-house or local labour, the installation can be overseen by a Landustrie supervisor who will ensure that the installation is done to a high standard. Our supervisor can also oversee commissioning and start-up of the brush aerators to ensure optimum performance and a long service life.



Landy brush aerator at WWTP Budva (Montenegro)



Commissioning at site

MAINTENANCE

Landustrie maintenance teams provide both preventive maintenance and, where required, corrective maintenance. Spare parts are available for prompt dispatch to your site so as to maintain your brush aerator's serviceability.

AFTERSALES SERVICES

Landustrie's aftersales service department is your lifelong connection with Landustrie, not only for spare parts but also for training, installation supervision, commissioning and start-up.

Decades of experience designing, manufacturing, operating and maintaining brush aerators makes Landustrie the ideal partner for after sales support for all makes of aeration rotor.

For more information:
aftersales@landustrie.nl

MORE THAN JUST BRUSH AERATORS

Landustrie produces a wide range of equipment for wastewater treatment, which includes:

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- Pumps
- Archimedes screw pumps
- Hydropower screws
- Surface aerators
- Ladox flow boosters
- Screen cleaners
- Clarifiers and sludge thickeners
- Aftersales service that is second to none

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