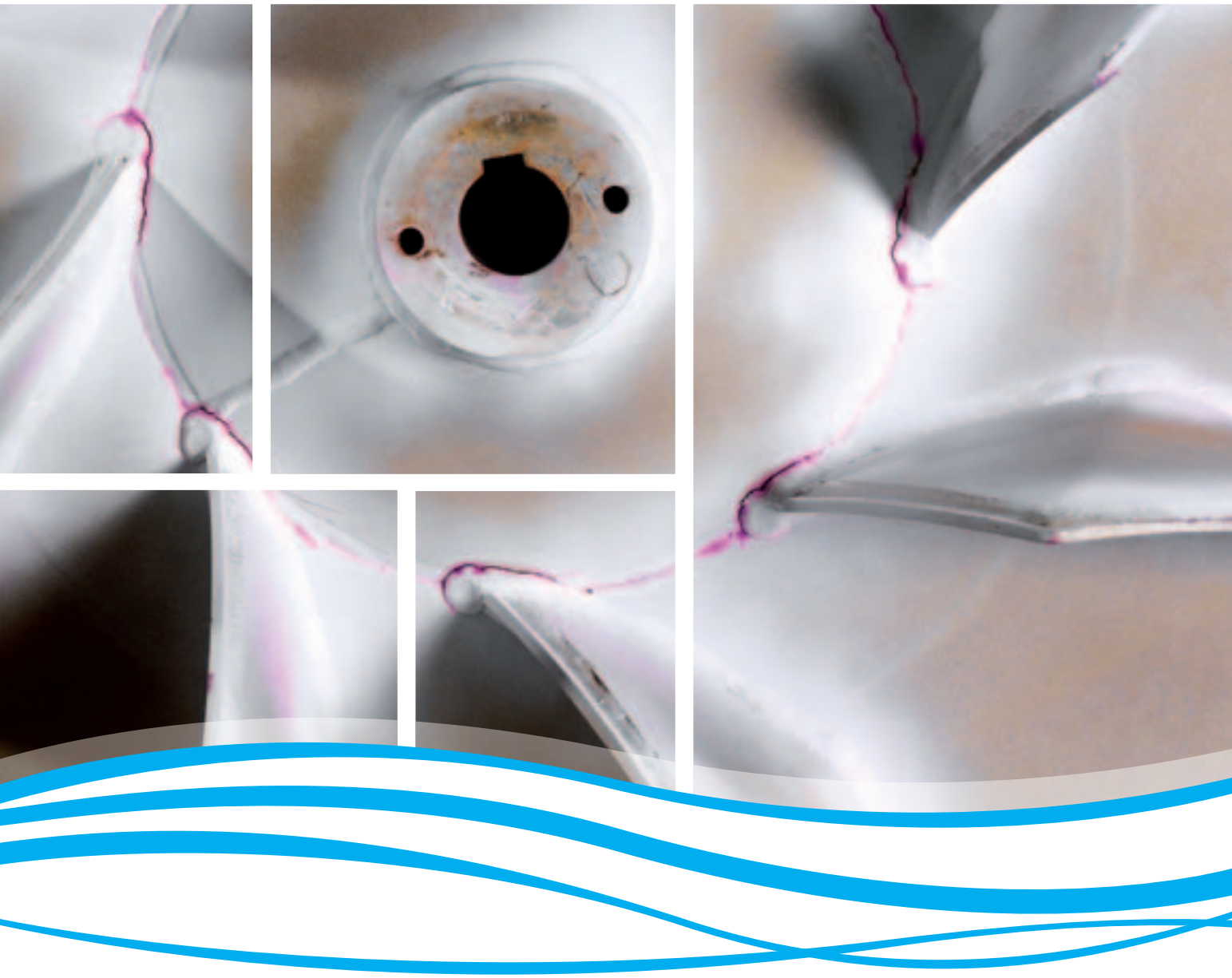
The fan impeller as an economic factor

Optimising, maintenance and repair by specialists



Venti Oelde

Industrial fans in use

Industrial fans operate under continual stress. Whatever the sector, fans are put under enormous strain during the production process, and are subject to especially punishing workloads in the cement and steel industries.

The stresses fans have to be protected against vary depending on the industrial sector in which they are deployed. They may for instance be exposed to temperatures of up to 1,000 degrees Celsius due to the circulation of hot gases, and various materials may be deposited on them. Such factors can easily cause damage to other components which may in the worst-possible case lead to a production shutdown.

For example, process gases laden with dust and particles can be a major problem if the dust or particles become baked onto the fan impeller, forming a crust. This normally leads to imbalance, reduced cross-sectional area and altered flow characteristics.

Fan impeller used in the cement industry, showing baked-on deposits and severe wear at the blade inlet edge and also on the back plate

Baked-on deposits caused by the conveyance of dust-laden gases can lead to breakdowns

Fan wheel used in the timber industry, showing wear and tear, and with some broken off and cracked blades

Another consideration needing special attention in rotating machines is the ever-present factor of vibration. Fans leave the factory certified with an excellent vibration rating. However, unfavourable gas/air flows, deposits, corrosion, abrasion or overheating, can alter the prescribed operating conditions, and this almost inevitably leads to increased vibration levels, to the noticeable detriment of the fan's smooth running.

Other clear alarm signals in all cases are rising energy consumption, falling air/gas flow rate and diminishing operational efficiency.

Far-sighted intervention

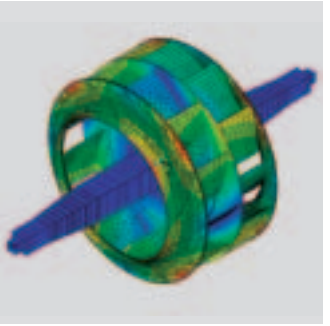
Continual monitoring of the installation during running is strongly advised, because the earlier a problem is identified the easier it is to remedy, thus avoiding long-term consequences. The first step is a visual check by trained personnel, because even the most sophisticated sensor systems and remote diagnostics via monitor cannot replace the human eye. It is also advisable to check the entire installation as a precautionary move.

If irregularities are identified Venti Oelde will step in immediately to conduct both remote and on-site diagnostics. Our committed and highly-expert personnel are specialists in the detection of problems in areas such as welds, seals, bearings, shafts and drive units. Our expertise and technology enable us to readily diagnose potential hazards and existing faults.

Urgent action is needed not only if process parameters change or the system's performance drops but also if performance has to be boosted for production-related reasons.

Special components can be used to minimise fan impeller wear and the risk of breakdown. For instance, the right shape, geometry and angling of the fan impeller blades or hardfacing with heat-resistant tungsten or abrasion-resistant chromium carbide all provide protection against both localised and large-scale wear and tear.

Visual check of a fan impeller in need of repair to assess the damage and prepare a cost estimate



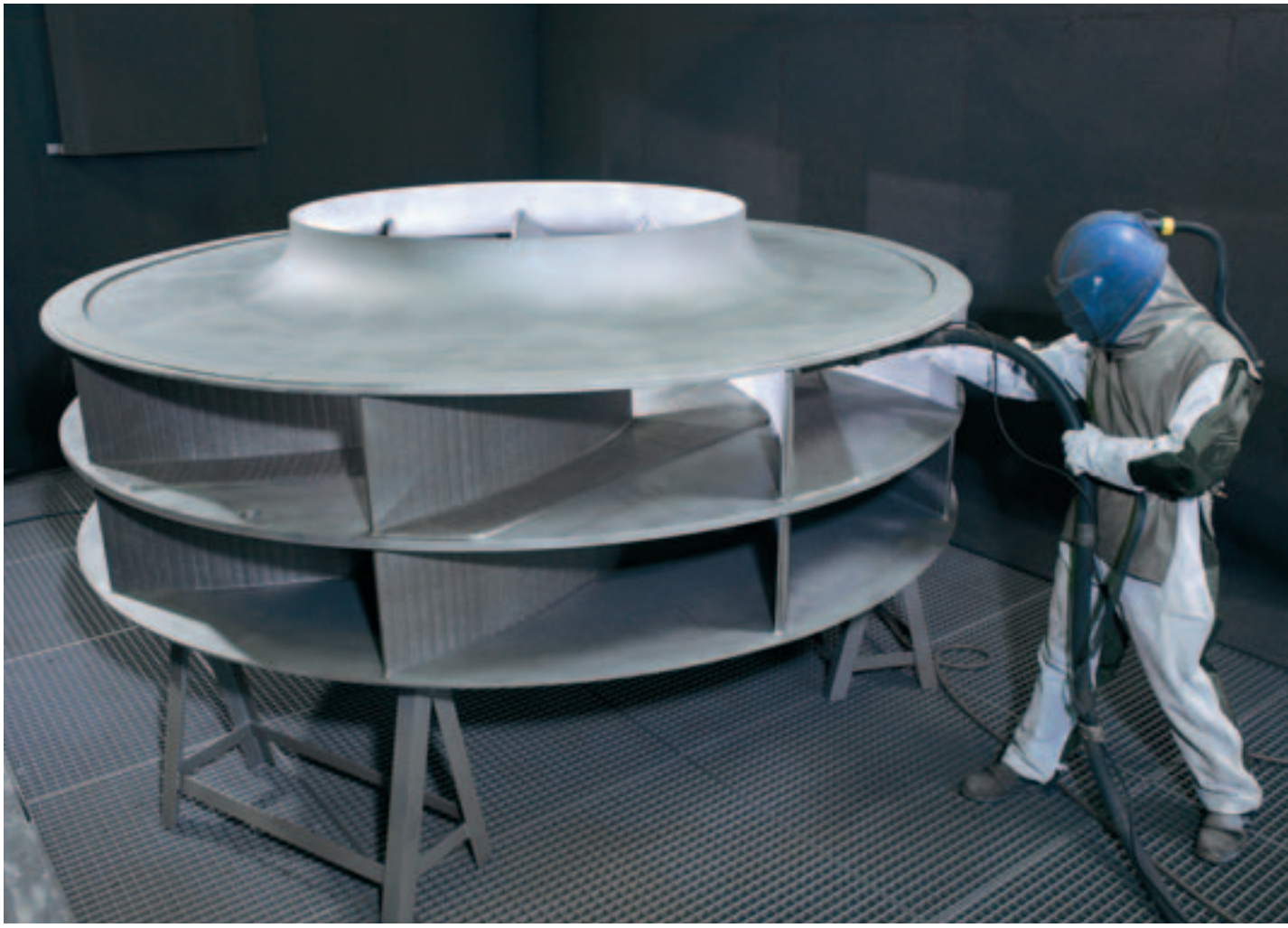
FEM calculation of a rotor

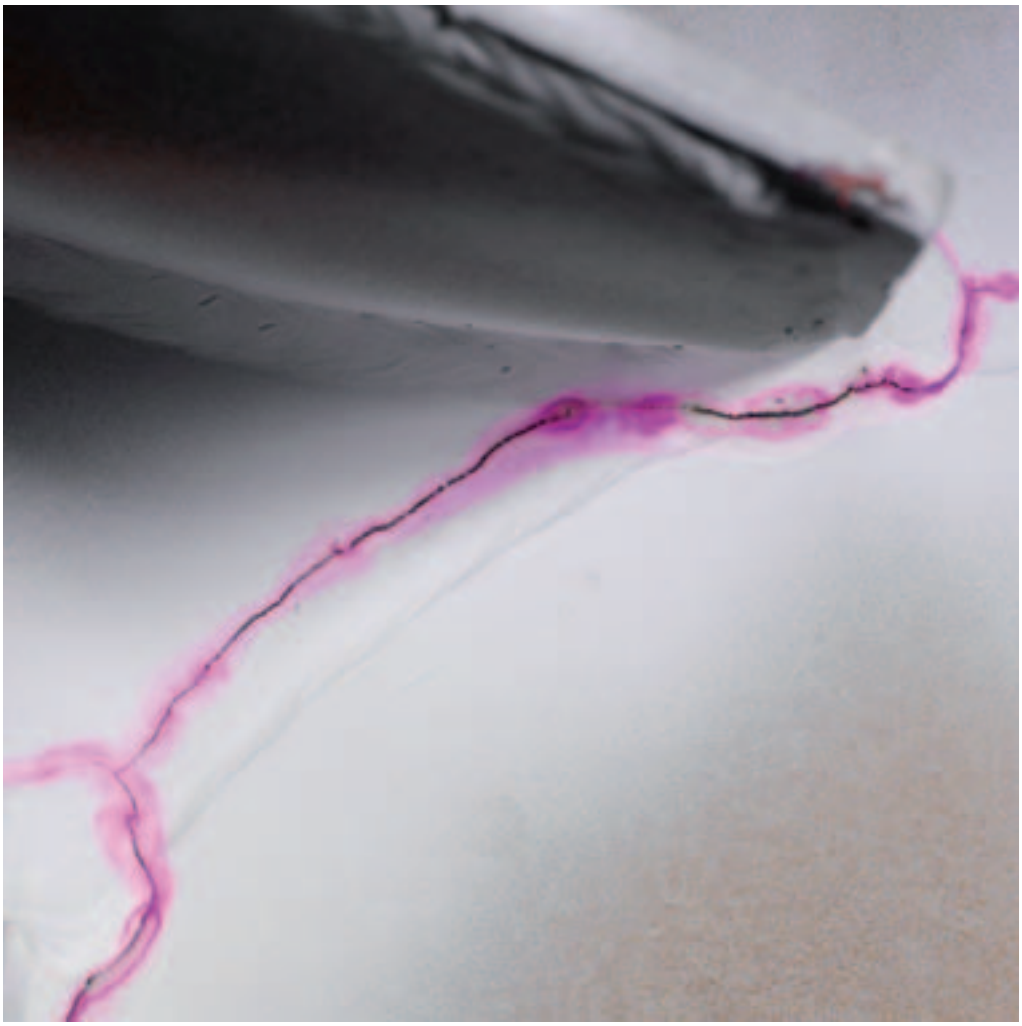
Vibration detection on a fan impeller bearing

Efficient, high-quality services

Venti Oelde offers a broad spectrum of services for the optimising, maintenance and repair of fan impellers. Depending on your needs Venti Oelde will carry out swift on-site repairs, conduct checks, keep logs and balance impeller or indeed carry out improvements to the entire installation. If the work involved will require transportation to the Oelde plant, Venti Oelde will on request dismantle the fan on-site and either provide advice on or arrange shipment itself.

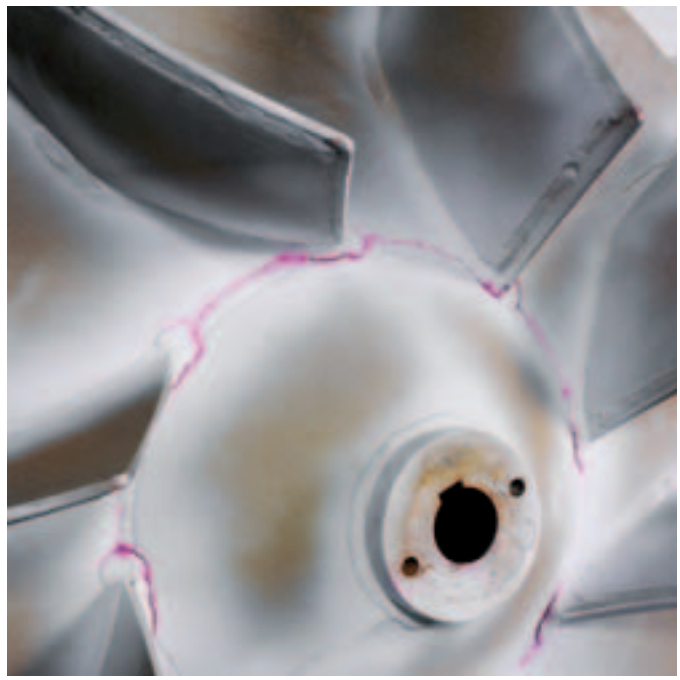
Welding work on a fan impeller under repair





Damage analysis/ crack inspection via dye penetrant testing in the area of the stiffening cone's join with the back plate

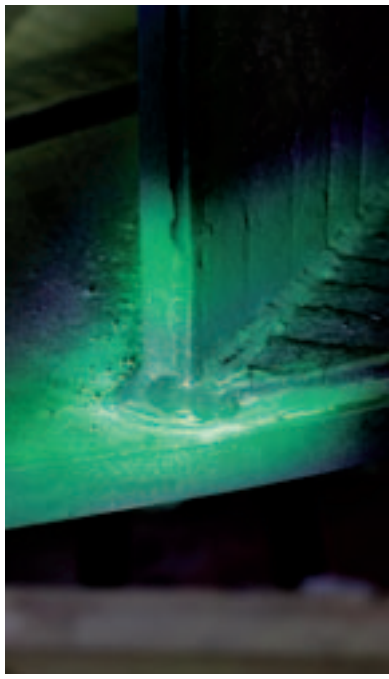
The Oelde plant operates standardised, cost-minimised procedures underpinned by a rigorous quality management system. Our specialists will carry out all the desired work according to the highest quality standards and provide thorough documentation of the work. On request, final testing and acceptance of the work may be attended by the client in our plant, and directly thereafter Venti Oelde will see to the return shipment and if required also reassemble and commission the fan.



Cleaning a double-inlet fan impeller by sandblasting

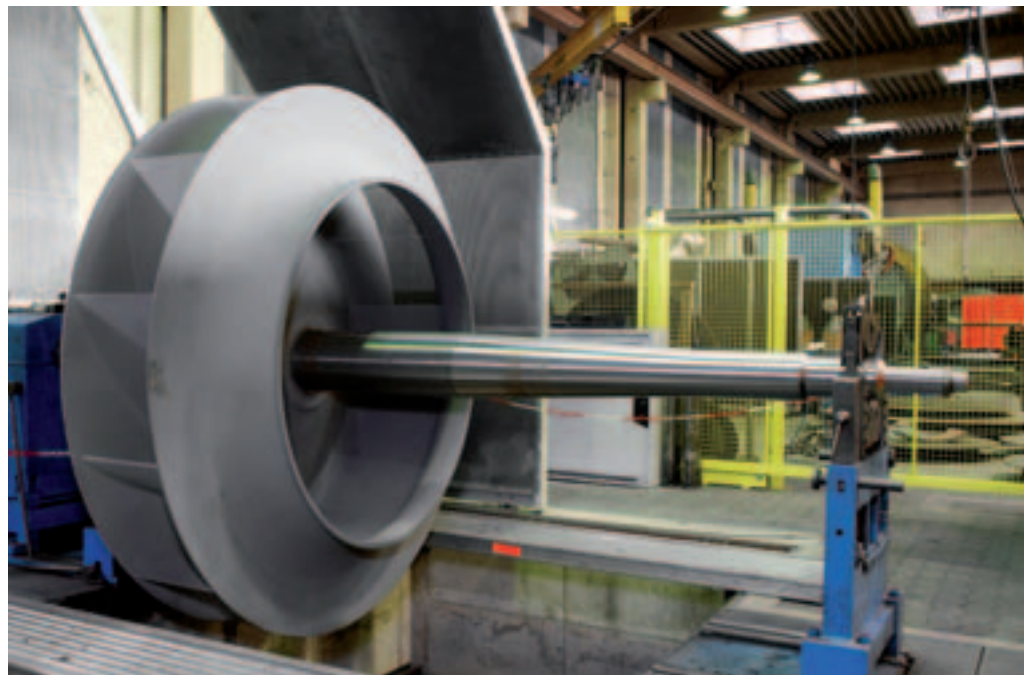
After dismantling and if necessary cleaning the steel parts, an initial visual check takes place. This is followed by technical fault detection via ultrasound and dye penetrant testing. All readings and inspection results are then checked against any existing documentation of the current operation and the original damage analysis.

On this basis Venti Oelde makes recommendations for any necessary repairs as well as any improvements which may appear expedient, for instance measures to enhance protection against wear and tear. A detailed cost estimate ensures transparency, the binding tender a cost control, while a timely coordination of all procedures ensures swift scheduling of the necessary work.



Surface crack check (MP) on the weld after the repair has been carried out

Balancing a single-inlet rotor mounted between bearings



Packing a repaired double-inlet rotor in a wooden transportation frame for safe shipment

A question of profitability

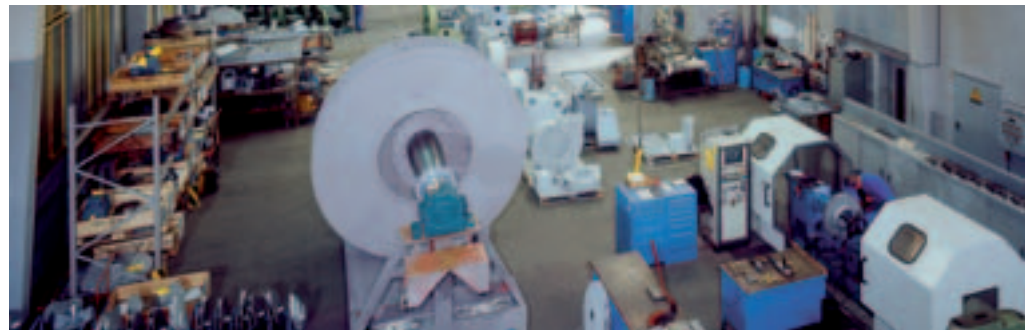
Additional protection against wear and tear at particularly susceptible spots by hardfacing the complete blade and fitting wear strips to both sides of the base plate

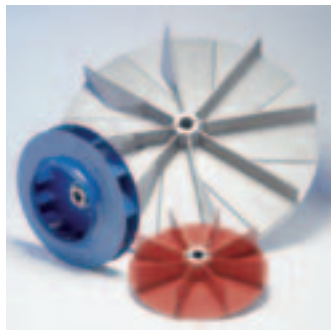
Fan impellers perform a vital function in the production process, conveying air, steam, gases, dust and airborn material. If a fan impeller breaks down this can in some circumstances lead to a complete production shutdown.

The Ventilatorenfabrik Oelde GmbH, known as Venti Oelde for short, carries out preventive servicing and maintenance work on fan impellers. Furthermore, at Venti Oelde we are of course happy to carry out any necessary cleaning and repair work on both our own products and those of other manufacturers.

To adapt fan impellers to expanding processes and increased demands, Venti Oelde also upgrades existing installations. Venti Oelde specialises in improving the performance and efficiency of fan impellers as well as ensuring their safe operation and prolonging their useful life.

Optimising and carefully maintaining fan impellers almost inevitably leads to productivity and cost benefits, thus giving you a competitive edge. Prevention, maintenance and optimising thus spell added profitability and undoubtedly represent a sound investment. After all, prevention is always better than cure.





Changing bearings regularly prevents unwanted shutdowns

Subject to alterations A 0/07/20/7.Stu

- Industrial fans
- Dust collection and process air cleaning plants
- Exhaust air treatment plants
- Ventilating, heating and air conditioning plants
- Recycling and waste processing plants
- Surface technology

Venti Oelde

Ventilatorenfabrik Oelde GmbH
P.O. Box 37 09
D-59286 Oelde
Phone: +49 25 22 75 - 0
Fax: +49 25 22 75 - 2 50
info@venti-oelde.de
www.venti-oelde.de