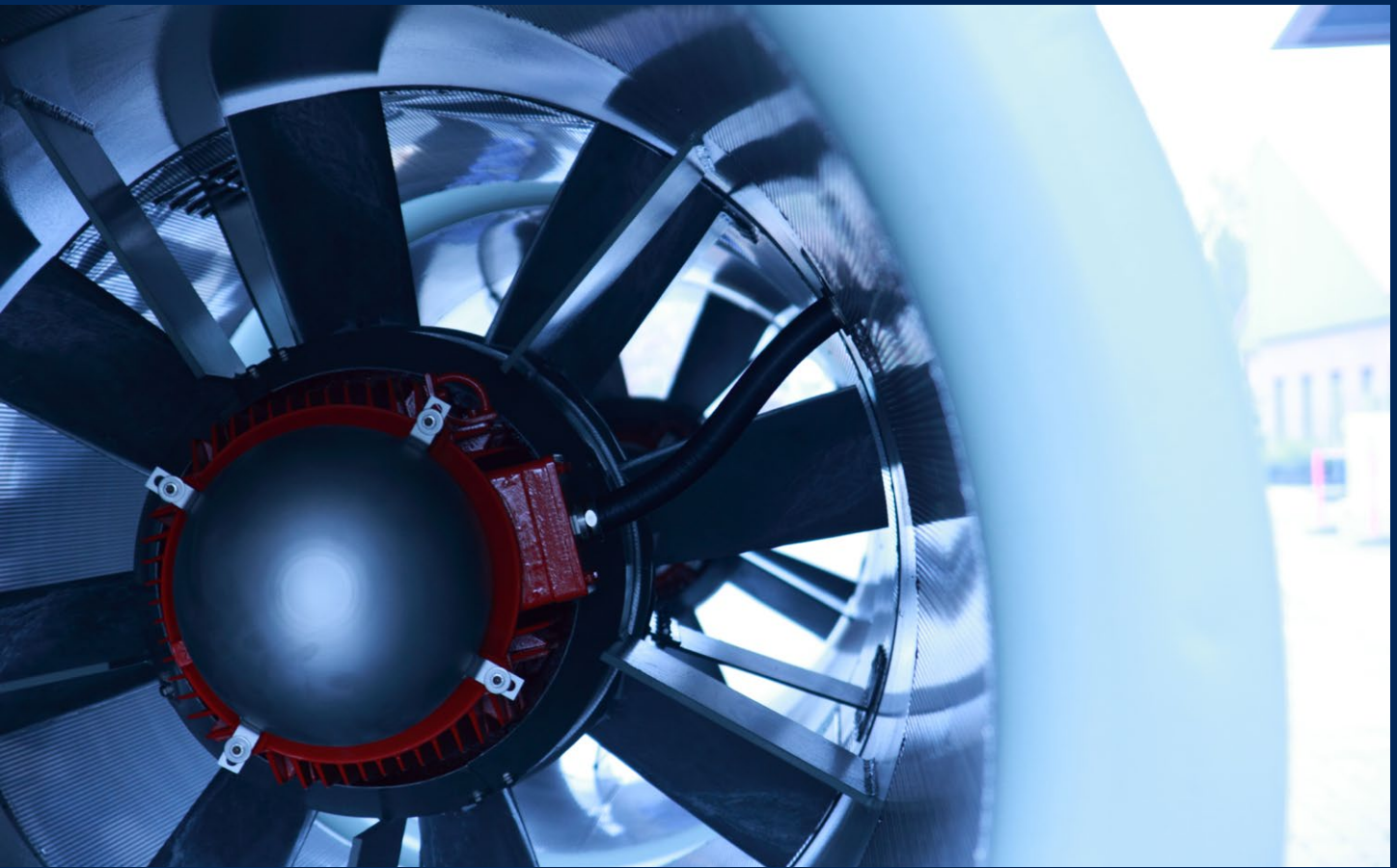


WITT&SOHN

IGW Ventilatoren



CUSTOMISED FANS

YOUR REQUIREMENTS, OUR FOCUS



WITT & SOHN

AN INTRODUCTION

Originally established as a supplier to the German shipbuilding industry, Witt & Sohn AG – currently a family-run company in the third generation – has also developed into a leading manufacturer of high-performance fans.

Thanks to our renowned specialist knowledge in the manufacture of axial and centrifugal fans, we're now a market leader in several demanding sectors requiring fan applications. In addition to commercial shipbuilding and navy vessels, we also supply customers in the areas of tunnel ventilation, nuclear power plants, chemical systems and environmental technology.

STEADY GROWTH

The Witt Group is constantly expanding: equipped with cutting-edge robot technology, our primary Witt & Sohn factory in Pinneberg near Hamburg now complements the Group's other manufacturing facilities in the UK, Switzerland and India.

Licensed production in Japan, Korea, Indonesia and Canada consolidates our international manufacturing presence, further supported by a global sales

network. Around 70 per cent of everything produced at our large factory with 50,000 square metres of manufacturing space is exported. Witt & Sohn also operates directly or on behalf of licensees in more than 60 countries across the globe.

Our aim is to assist customers around the world with their operations by offering top-quality products. We set great store by continuous innovation – our fans are the result of ongoing research and development. Executive Directors Henrik Witt and Karsten Witt underline Witt & Sohn's strategy of delivering technical excellence through innovation with their commitment to both national and international research projects. They represent the interests of the German industry in a variety of international standards committees.



RESEARCH & DEVELOPMENT

WITT & SOHN'S INNOVATION FACTORY

On average, Witt & Sohn invests five per cent of its sales back into research and development to ensure it can offer customers cutting-edge fan technology. Thanks in large part to our modern research department in Pinneberg and regular, close collaboration with research groups round the world, we're one of the leading manufacturers of fans.

In addition to continuously optimising conventional axial and centrifugal fans, our most recent research projects also focus on the following:

- **Increasing tip speeds (160 m/s has already been certified for F400)**
- **Increasing fan efficiency (efficiency of 89 per cent achieved thus far)**
- **Increasing temperature resistance (already up to 700°C)**
- **Increasing stability**
- **Using new materials**
- **Reducing life cycle cost**

Our ongoing research and development enable us to provide our customers with maximum performance and cost efficiency at all times, which they can successfully apply to their individual application scenarios.



Karsten C. Witt and Dr. Henrik T. Witt (FLTR)

WHAT WITT & SOHN OFFERS

AN OVERVIEW OF THE PRODUCT PORTFOLIO

Witt & Sohn's product portfolio is one of the most extensive ranges of industrial fans in the world.

We manufacture both axial and centrifugal fans. Witt & Sohn's construction philosophy is to offer a variety of impellers for each type of fan. We combine individual blades and hubs to create impellers that meet customer's requirements, thus ensuring the most profitable design for you. When combined with the appropriate impeller, the aerodynamically optimised design of the Witt & Sohn products guarantees our customers maximum energy efficiency when using the fans.

If a change is introduced to the operating point during the project, the fans can often be altered by replacing the impeller or changing the blade angle, meaning Witt & Sohn can respond quickly and flexibly to changing project requirements without having to replace the entire fan.

VARIETY OF DRIVE TYPES

With its range of fans, Witt & Sohn offers its customers a variety of drive types. Nearly all possible working points with a volume flow rate between 100 and 1,000,000 m³/h as well as pressure increases between 100 and 50,000 Pa can be achieved with a direct drive at high degrees of effectiveness. Our product portfolio also comprises a variety of designs with a V-belt drive. And finally, the fans can also be manufactured with a drive via a coupling or with pneumatic, hydraulic or water motors.

EXPLOSION PROTECTION WITH ATEX CERTIFICATE

Our range also includes products that conform to explosion protection requirements. Witt & Sohn's fans which feature the special construction characteristics required by the relevant ATEX (atmosphères explosibles) regulations come with an ATEX certificate, confirming conformity.

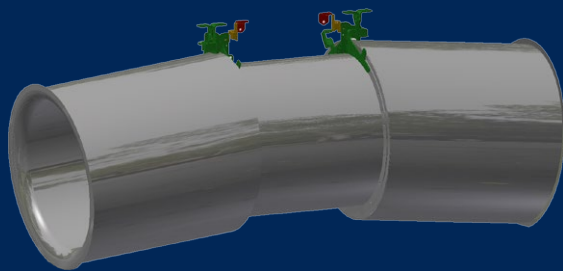
PROCESSING A WHOLE HOST OF MATERIALS

Thanks to the ongoing manufacture of fans which have to live up to the most stringent requirements in a variety of applications, including nuclear power plants, navy vessels and chemical systems, Witt & Sohn has extensive experience in the processing of every type of material: regardless of whether it's conventional steel, aluminium or special steel, they're all processed in line with standards. Less common materials such as titanium are becoming more and more common.

STANDARD SPECIFICATIONS

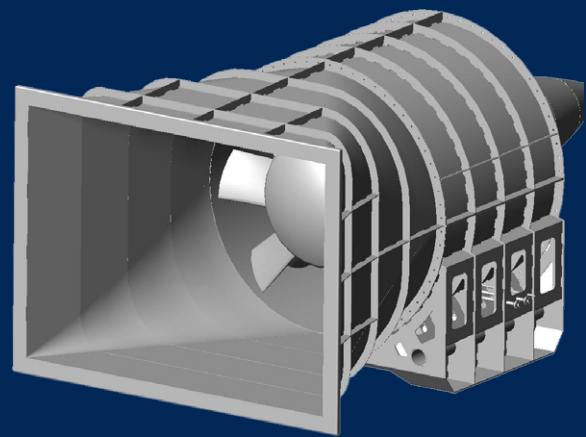
Witt & Sohn offers a large number of outlet positions, designs, casing thicknesses, materials and impellers for various fan types as standard. You can find an overview here:

STANDARD TUNNEL JET FANS GARAGE JET FANS BANANA JET® FANS



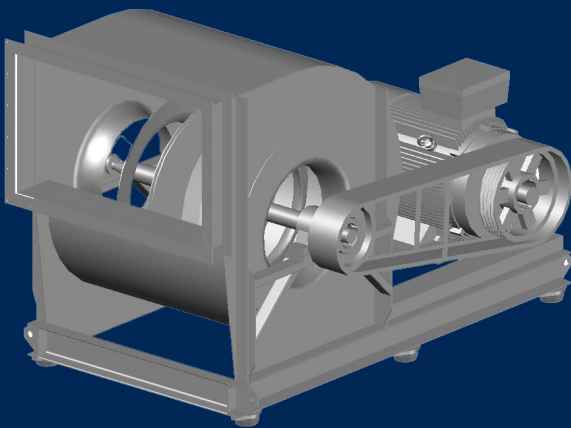
- Inlet size: 250 to 1,800 mm
- Casing thickness: 3.0 to 16 mm
- Impeller types: N, M, X, Y (adjustable pitch)
- Special design: High temperature, earthquake-proof, according to requirements

AXIAL FANS/TUNNEL OR SMOKE EXHAUST FANS



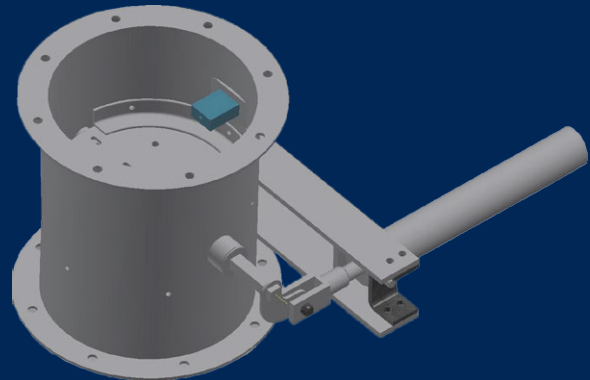
- Inlet size: 250 to 3,550 mm
- Casing thickness: 3.0 to 16 mm
- Impeller types: N, M, X, Y (adjustable pitch)
- Motor frame size: 63 to 450
- Drive type: Direct, belt and coupling drive
- Position: A, AU, AD, B, BD, BU in accordance with Eurovent
- Casing form: Short/long casing, swing out, with/without shaped inlet
- Impeller materials: Corrosion-resistant cast aluminium, steel and stainless steel
- Special design: Explosion-proof, high temperature, shockproof, earthquake-proof, according to requirements

CENTRIFUGAL FANS



- Inlet size: 63 to 2,500 mm
- Casing thickness: 1.5 to 20 mm
- Casing: RNZ & LRZ (low pressure), PRZ & MRZ (medium pressure), HRZ (high pressure), SRZ & TRZ (ultra-high pressure)
- Impeller types: At least six types per casing, including dust fans
- Drive type: Direct and belt coupling drive
- Materials: Steel, aluminium, stainless steel, special materials
- Position: In accordance with Eurovent
- Special design: Explosion-proof, extreme temperature, gas-tight, decontaminable, corrosion-resistant, earthquake-proof, shockproof, according to requirements

STANDARD ACCESSORIES



- Inlet cones
- Fire dampers
- Protective grills
- Inlet cowls
- Vibration attenuators
- Jet cowls
- Flexible connections
- Counter flanges
- Silencers
- Variable inlet vanes
- Dampers
- Insulation
- Sound enclosures
- Monitoring instruments

A MODULAR DESIGN ENSURES FLEXIBILITY

Witt & Sohn's product philosophy is to offer customer-specific fan solutions – in a fully computerised construction environment.

YOUR REQUIREMENTS, OUR FOCUS

Our sales engineers maintain constant exchange with our customers: we want to understand the requirements resulting from your system design, so that we can work together to recognise potential problems before they arise and avoid them with intelligent alternatives, including those for reducing operation costs.

To provide you with a fan that meets your specific requirements, we work with standardised fan constructions whose modules can be mixed and matched. CAD programs developed specifically for fans also make it possible to promptly implement the necessary modifications.

FAST AND COST-EFFICIENT

In this way, we're able to efficiently implement technical requirements such as operating conditions, space limitations, special materials and surface treatments on your behalf, as well as work more cost-efficiently and quickly than the conventional use of special design methods would allow.

It goes without saying that Witt & Sohn delivers its products with the corresponding documentation, the extent of which can vary from standard documentation to special documentation for nuclear power plants, including the required provisional and final acceptance.

THE LATEST COMPUTER TECHNOLOGY

Continuous investment in the latest IT technology has allowed Witt & Sohn to develop a modular kit and fully integrate management and production.

The fan datasheet is a key element of our work and allows the customer and Witt & Sohn to include all the data relevant for a fan, including special requirements, on a single page. The Witt fan datasheet has been adopted as a standard specification for fans in nearly all industry sectors.

AN OVERVIEW OF YOUR BENEFITS:

- **Fan models with infinite elements**
- **Reinforced impeller blades, developed through stress analysis**
- **Impellers with 90 per cent higher operating speed**
- **Guaranteed reliability**
- **Compact design**
- **Competitive prices**



SAFARI
DARLEY

QUALITY PROMISE

BY WITT & SOHN

Witt & Sohn enjoys an exceptional reputation for quality and has long been incorporated into the process of developing international fan standards. Certified in accordance with the German nuclear quality standard (KTA 1401) in 1976, Witt & Sohn was one of the companies in Germany to obtain ISO 9001 certification early on.

HIGH PROCESS AND PRODUCT QUALITY

The most recent customer surveys have revealed that more than 90 per cent of our customers equate Witt & Sohn products with exceptional quality and a long service life. Customer complaints, including customer error and incomplete deliveries, consistently amount to less than one per cent of all deliveries. To achieve and continuously maintain this high degree of process and product quality, Witt & Sohn relies on a whole host of measures.

This begins with receipt of an enquiry: a fan datasheet is automatically prepared for every customer enquiry at Witt & Sohn, enabling us to develop a detailed specification and a quote, typically within

24 hours. Upon receipt of an order, all data is automatically digitalised. Information is only entered once for quote and order processing and checked by the customer in the fan datasheet included in the order confirmation, allowing us to ensure maximum efficiency and minimise work for our customers.

From the very beginning, Witt & Sohn ensures complete traceability throughout all the management and production steps associated with the fans.

CNC-MANAGED PRODUCTION

Witt & Sohn's production facility is equipped with state-of-the-art machinery. We produce all parts with computer numerical control (CNC) machinery, enabling us to achieve minimal lead times and the most stringent tolerances on behalf of our customers.

PERSONNEL DEVELOPMENT

Only highly qualified personnel manufacture Witt & Sohn products. We're particularly proud of the high technical quality of our work and the loyalty



of our staff. Many employees have been with the company for more than 30 years.

The ability to process any number of different materials is based on the exceptional training of our welders. Thanks to continuous training and annual welding tests, they possess the TÜV certificates required for the work we do.

ACCEPTANCE INSPECTION

Before delivery, Witt & Sohn ensures that each and every fan undergoes a test run and final inspection. Witt & Sohn's modern testing facility is used to develop large fans and test them with motor capacities up to 2 MW prior to delivery. Our highly qualified personnel measure performance, sound and vibration and carry out modal analysis.

A 10 kV power supply with a variety of transformers is available to test fans with high-voltage motors. Frequency converters up to 800 kW and soft starts up to 600 kW complete our testing capabilities. Both 50 Hz and 60 Hz are available.

SAFETY

We supply all our fans with CE marking, which confirms that Witt & Sohn products conform to the European Machinery Directive and come with the corresponding documentation. Witt & Sohn also offers a comprehensive range particularly for heat-resistant fans for tunnels and metro projects as well as for the explosion protection sector.

GUARANTEE

To underline its company philosophy of offering first-class quality, Witt & Sohn offers a guarantee of 18 months following delivery (twelve months following installation) for all fans. Longer guarantee periods can be agreed with the conclusion of maintenance contracts.



THE WITT GROUP

AN OVERVIEW

Through the acquisition of several fan companies, the Witt Group has been able to expand over the past several years. All the acquired companies can draw on their own traditions in technical expertise and exceptional engineering achievement, making them an excellent addition to Witt & Sohn's range of services and quality philosophy.

ENGLAND



Now part of our affiliated company the Fan Systems Group, the Alldays Peacock company has been moving air since 1625 – for centuries with bellows and now, since the 19th century, with fans, making Alldays Peacock a true pioneer in the ventilation industry which still exists to this day.



Fan Systems has brought exceptional expertise in the construction of centrifugal fans to the Witt Group and offers specialist capabilities in sound-absorbing and vibration-damping solutions. Located in the centre of England, Fan Systems can offer customers all over the British Isles exceptional service.

SWITZERLAND



Meidinger AG is a pioneer in the fan industry, originally established in 1900 to develop exceptionally quiet fans for organ builders – a market niche in which the company still excels to this day. The technologies developed for this application have been applied to many other areas over the decades.

The chemistry industry is now one of Meidinger's primary markets and the company boasts extraordinary expertise in the use of special materials. Meidinger manufactures explosion-proof fans

which, thanks to the use of unique materials and coating systems, are suitable for toxic and corrosive environmental conditions. The company has also made a name for itself with fans for biogas plants. The manufacturing facility in Basle at the tri-point of Switzerland, Germany and France enables Meidinger to effectively serve customers throughout Central Europe.

INDIA



Established in 2008, Witt India Pvt. Ltd. is an Indian and German joint venture which, with the support of Witt & Sohn AG in Germany, is able to offer and locally manufacture the entire product range. Trained in Germany, a dedicated construction team has developed and successfully delivered many customer-specific solutions for the Indian market since it was founded.

Witt India Pvt. Ltd. manufactures axial fans, smoke exhaust fans, jet fans and centrifugal fans at the manufacturing facility in Indrakaran Village, Sangareddy Mandal, Medak Dist., near Hyderabad.

SWEDEN & DENMARK



The manufacturing facilities are supported by the sales companies FläktComp (Sweden) and LF Marine (Denmark).





REFERENCES

Over the past several decades, Witt & Sohn has gained experience in many fan applications. The following summary of our reference lists demon-

strates the extensive range of our activities. We've produced fans for the following applications:

VARIOUS INDUSTRIES

For more than 80,000 systems. Between 0.09 kW and 1,000 kW

SHIPBUILDING

For more than 20,000 ships in over 60 countries

NAVY VESSELS

For more than 1,000 ships (most of which in accordance with BV043, military specifications, etc.)

TUNNEL FANS

For more than 1,000 tunnels. Thrust up to 4,000 N

FANS FOR METRO PROJECTS

For more than 100 metro projects, diameter up to 3,550 mm

NUCLEAR POWER PLANTS

For 70 nuclear power plants in ten different countries

We will be happy to provide you with separate reference lists for individual applications upon request.

A PARTNERSHIP FOR QUALITY

For most of our customers, purchasing a fan is not just a one-off event, but rather the beginning of a supply relationship that goes on for decades. Our fans often become a regular feature of our customers' technical specifications.

From past experience we know that our tried-and-tested specialist knowledge, our product quality

and our continuous efforts to improve both products and the production process make Witt & Sohn an attractive, long-term partner.

We would be delighted to welcome your company as one of our customers.

WITT&SOHN

IGW Ventilatoren

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