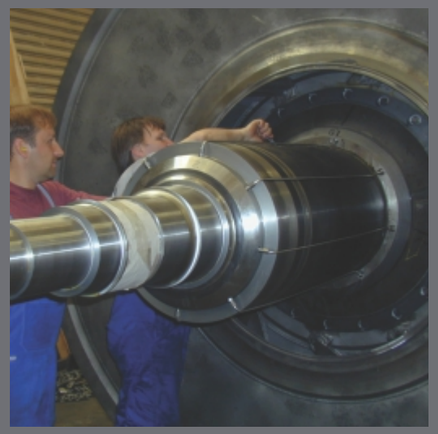
Cement Plant Fans

a company of POWERCHINA

TLT-Turbo

Company Overview



- TLT-Turbo offers service for any axial and centrifugal flow fans.
- TLT-Turbo together with our affiliates will be a local partner in fast growing emerging markets for all applications.
- TLT-Turbo has numerous references that showcase our track record across all applications - including some of the highest profile projects around the world. TLT-Turbo has regional offices in 12 countries with sales offices and representatives in 40 countries.
- Our four factories located in North America, South Africa, Europe and China together with our professionals from development, design engineering, installation, sales and administration, can offer you the best solution for convenient and swift service and rebuilds for your fans.
- Today TLT-Turbo builds axial and centrifugal flow fans for almost any application. The capability of TLT-Turbo GmbH is evident in the matured product range, which has stood the test under very difficult, and sometimes extreme conditions on the international markets.

TLT-Turbo is one of the world's leading manufacturers of technology-driven industrial fans and ventilation systems.

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Fans in Cement Plants

Typical fan arrangement of Fans in Cement Plants.

Fans in cement plants are typically centrifugal fan types (single or double flow). The blade design can be either a profiled shape or with single thickness plate blades. In most cases, variable speed systems are used.

In difficult and extreme operational conditions, TLT-Turbo fans provide trouble-free, reliable operation for our customers.

Raw Mill Fan

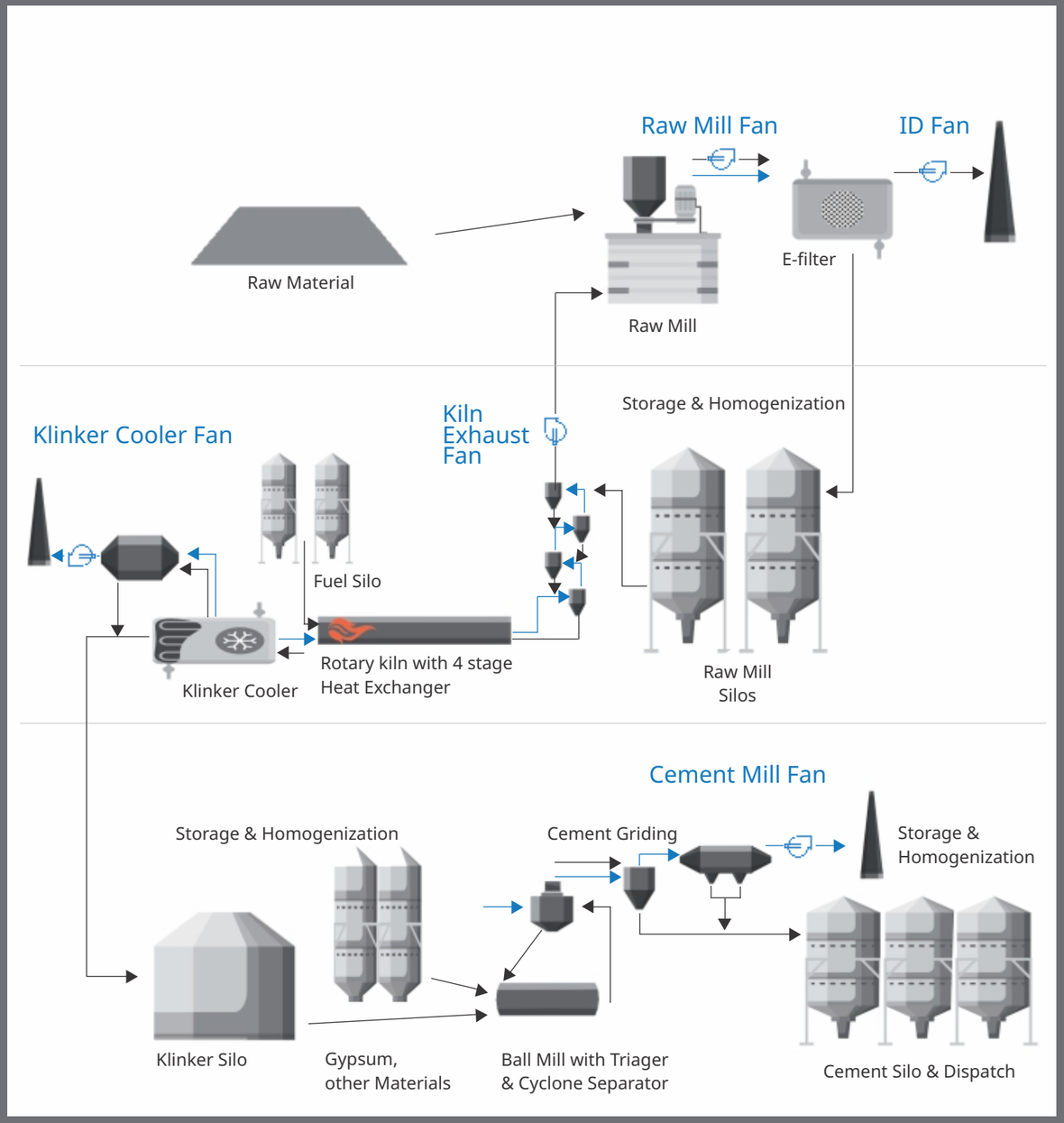
Technical Data:

- Volume flow 80-350 m³/s
- Temperature 90-100 °C
- Mech. design temperature 250 °C
- Pressure increase 7.000–10.000 Pa
- Shaft power 4.500 kW

Special Features:

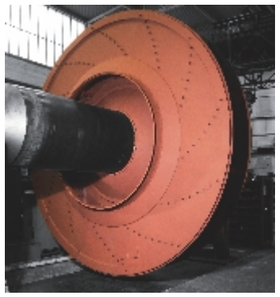
- Dust loaded with 30-50 g/m3 (wearing)
- Operation behind cyclone
- Impeller and main disc are equipped with wear protection (compound wear plates)
- Spiral of casing with additional wear protection made from S355 J2+N (S690QL)
- Fan control: in the majority of cases with damper flaps on the suction boxes

Typical Production scheme of a cement plant. (typical)



Fans in Cement Plants

Typical fan arrangement of Fans in Cement Plants



We help you to select, plan and calculate the suitable fans, components and systems to meet your operational needs.

Our extensive experience means that we are can envision and design the optimal solution for every application.

Raw Mill Baghouse Fan

Technical Data:

▶ Volume flow	100-450 m³/s
▶ Temperature	ca. 150 °C
▶ Mech. design temperature	200 °C
▶ Pressure increase	2,500–3,500 Pa

Special Features:

- ▶ Often with aerofoiled blades
- ▶ Fan control: in the majority of cases the speed control is performed by frequency converters

Kiln Exhaust Fan

Technical Data:

▶ Volume flow	70-180 m³/s
▶ Temperature	240-430 °C
▶ Mech. design temperature	400 °C 500 °C (for a short time in event of fault)
▶ Pressure increase	7,000–10,000 Pa (exception: 13.000 Pa)

Special Features:

- ▶ Dust loaded with 30 g/m3 (strong build-up)
- ▶ Use of a special blade shape to extend the operation period between maintenance
- ▶ Use of an air blower unit (compressed air onto the blades) against caking
- ▶ Fan control: speed control by frequency converter
- ▶ At high volume flows two fans are running at the same time

Clinker Cooler Fan

Technical Data:

▶ Volume flow	100-350 m³/s
▶ Temperature	200-430 °C
▶ Mech. design temperature	400 °C
▶ Pressure increase	2,000–3,500 Pa

Special Features:

- ▶ Operation behind filter (therefore in general, no wearing)
- ▶ Increased number of damages in case of filter failure or outages (therefore not equipped with profiled blades)
- ▶ Wear protection (as Raw Mill Fan)
- ▶ Fan control: speed control by frequency converter
- ▶ Sometimes the speed is conditioned by high amounts of volume flow and low pressure at the same time

Coal Mill Fan

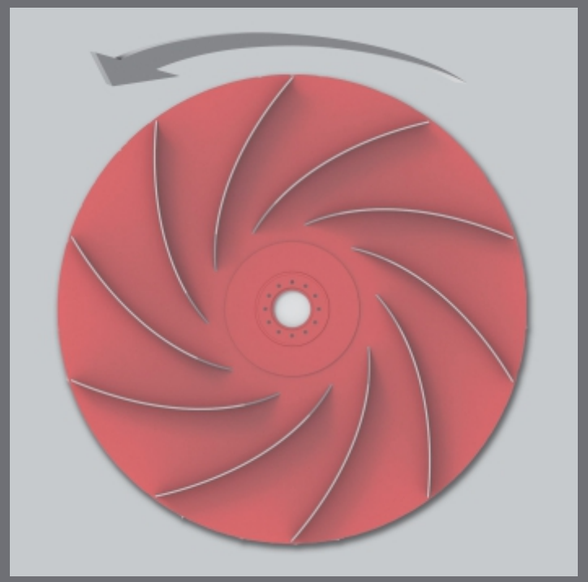
Technical Data:

▶ Volume flow	20-60 m³/s
▶ Temperature	ca. 100 °C
▶ Mech. design temperature	150 °C
▶ Pressure increase	ca. 8.000 Pa
▶ Shaft power	to 900 kW

Special Features:

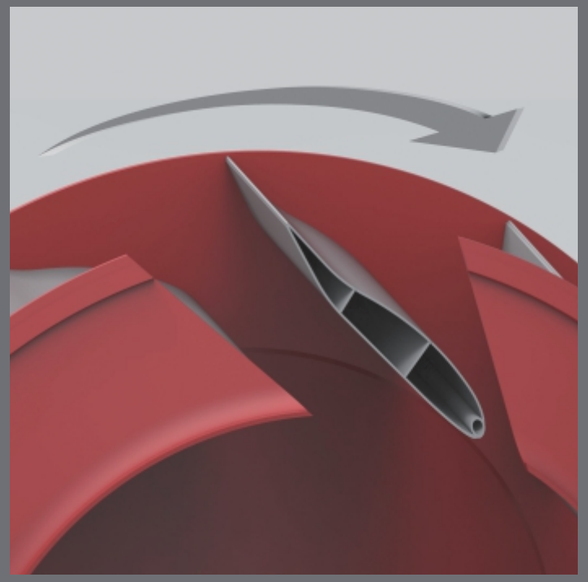
- ▶ Often applications in dust loaded air (risk of explosive pressure shocks)
- ▶ Therefore casing and suction boxes are designed with a pressure shock resistance of 1.4 bar (casing and suction boxes may deform but not break)
- ▶ Fan control: in the majority of cases with damper flaps on the suction boxes

Typical Forms of Blades



Impeller backward curved, high pressure increase at high efficiency.

Inlet angle:	35°–45°
Outlet angle:	from 40°–45°



Impeller with airfoiled blades for Raw Mill Baghouse Fans

Inlet angle:	20°
Outlet angle:	50°

Caking

TLT´s measures to reduce caking:

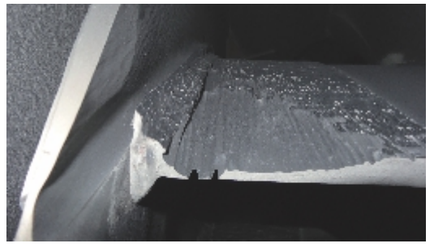
- Use of backward curved steel plate blades with a smaller bending
- Use of a blow-off device for cleaning the blade duct

Effect: Longer period of uninterrupted run

Wear – Reducing Factors:

- The reduction of the rotational speed
- The smaller relative speed of dust particles to fan blades
- The increase of material hardness
- The shape of the blades

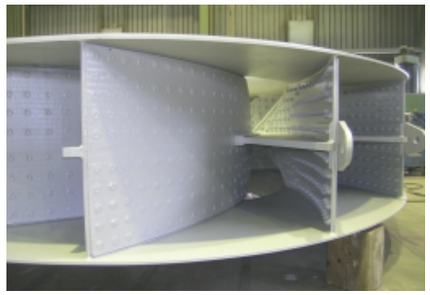
Where Does Wear Originate & What Measures Do We Take?



TLT-Turbo´s measures for reducing wear due to dust:

- Use of optimal backward curved steel plate blades
- Installation of wear protection (composite hard-faced plates) with a hardness of about 61 to 63 HRC
- TLT-longlife-thin layer tungsten carbide protection (HVOF - TLT H101)

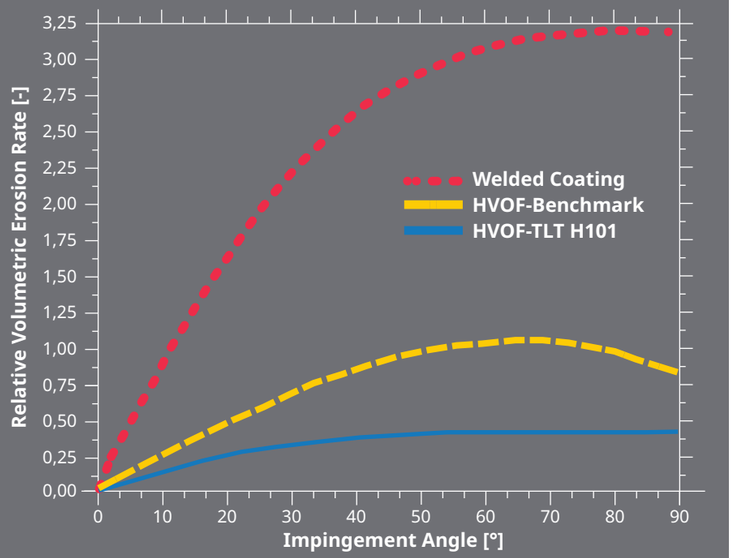
TLT-Turbo Wear Protection Measures



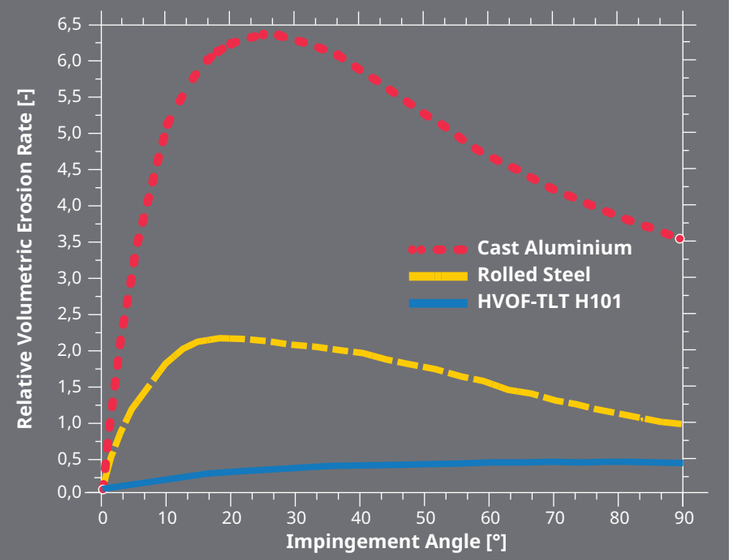
We are able to considerably extend the life of your impeller, due to tailored wear protection.

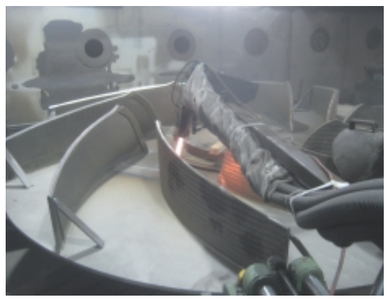
In cooperation with our customers, new, innovative solutions for abrasive-resistant surface coating are constantly being implemented.

Results of TLT-Turbo Particle Flow Erosion Tests



Erosion rate of TLT-Turbo's HVOF tungsten carbide coating H101 (HVOF-TLT H101), compared to typical fan materials as a function of abrasive particle jet flow impingement angle.





Spraying procedure HVOF-TLT H 101

Installation & Commissioning

TLT-Turbo's experts will assist with:

- Erection of the fan
- Commissioning of the fan
- Train your staff members in correct handling

Increased Production

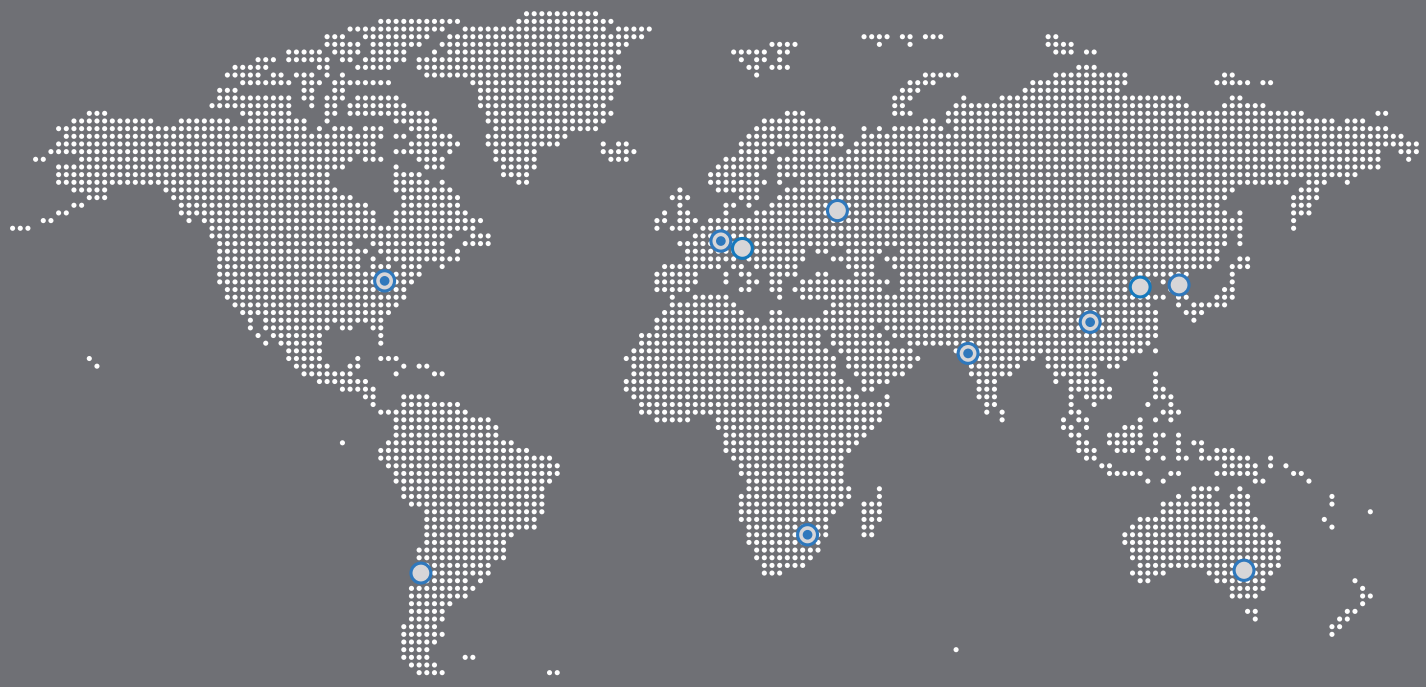
Would you like to increase production?
Do you have new legal requirement to fulfill?

- TLT-Turbo will help to improve the performance of your centrifugal impellers
- We help to improve your equipment output
- We will supply new powerful impellers

We have delivered over 850 fans to cement plants worldwide.

First-class engineering, tradition and success in ventilation technology as well as a global service-network:
These are the factors that have earned TLT-Turbo fans and systems a trusted reputation worldwide.

Germany . China . South Africa . USA . India
Australia . Austria . Chile . Hungary . Russia . South Korea



Business Location with Manufacturing and Service Workshop

TLT-Turbo GmbH
TLT-Turbo (Sichuan) Co., Ltd.
TLT-Turbo Africa (Pty) Ltd.
TLT-Turbo Inc.
TLT-Turbo India (Pvt.) Ltd.

Business Location

TLT-Turbo Branch Australia, Adelaide
TLT-Turbo Branch Korea, Seoul
TLT-Turbo Branch South America, Santiago de Chile
TLT-Turbo Rep. Office Austria, Vienna
TLT-Turbo Rep. Office China, Beijing
TLT-Turbo Rep. Office Hungary, Budapest
TLT-Turbo Rep. Office Russia, Moscow

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TLT-Turbo

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Website