



Fans for the Steel Industry

The Next Generation of Ventilation Technology

a company of  POWERCHINA



TLT-Turbo

Company Overview

A History of Continuous Innovation

- 1873** First centrifugal flow fan for mine ventilation
- 1950** First axial flow fan with blade adjustment for mine ventilation
- 1985** First fan for "wet" flue gas desulphurization
- 1997** First wind tunnel fan with CFRP-impeller
- 2007** Centrifugal fan with an impeller diameter of 5.3 m
- 2011** Fan for the quietest aero-acoustic wind tunnel
- 2015** Centrifugal fan with 12.3 MW required power
- 2016** First MVR Fan with ceramic hybrid bearing

Our Expertise & Global Reach

- ▶ Over 140 years of expertise in production of fans
- ▶ Present in 12 countries with business locations and 50 representatives across 40 countries
- ▶ Over 6000 fans installed worldwide
- ▶ Locations for product development and manufacturing in Germany, USA, China and South Africa
- ▶ Test stands in Germany, China and USA
- ▶ Use of the latest design tools such as FEM and CFD

Fans in steel mills and steel works operating in tough conditions.

The steel industry presents challenging operating conditions for fans such as high speed, high and changing temperatures, dust load, high peripheral speed, wear and much more! It is in this tough field of application that TLT-Turbo fans can be applied to optimize your operations.

Single or double flow centrifugal fans are typically used in the steel industry for use in converter dedusting plants (wet systems), sinter plants, dedusting systems for blast furnaces and steel works, pellet plants and much more. Axial impulse fans are used in converter dedusting plants with dry cleaning systems.

As wear is always a problem, the impellers have to be protected with different systems such as compound plates or, more recently, with spray systems which increases the hardness up to approximately 75 HRS. The challenge for fans operating in steel plants is the fact that the fan has to endure a long period between scheduled maintenance shutdowns. Therefore it is crucial that the fan is specifically engineered and optimized for the environment and for a longer operational lifespan between maintenance.

TLT-Turbo fans offer customers reliable performance that has been field-proven in installations worldwide. Our expert engineers work to continually innovate and improve our product offering. Our R&D department provides support for product improvements, while our project management and field service teams ensure guaranteed high process quality and hassle-free installation and commissioning.



Fans for Applications in the Steel Industry

- ▶ Pelletizing Plants
- ▶ Sintering Plants
- ▶ Converter with Wet and Dry cleaning Applications
- ▶ Coke Dry Quenching Systems
- ▶ Dedusting Fans
- ▶ Gas Booster Fans



Pelletizing Plant

CAF - Cooling Air Fan

Technical Data:

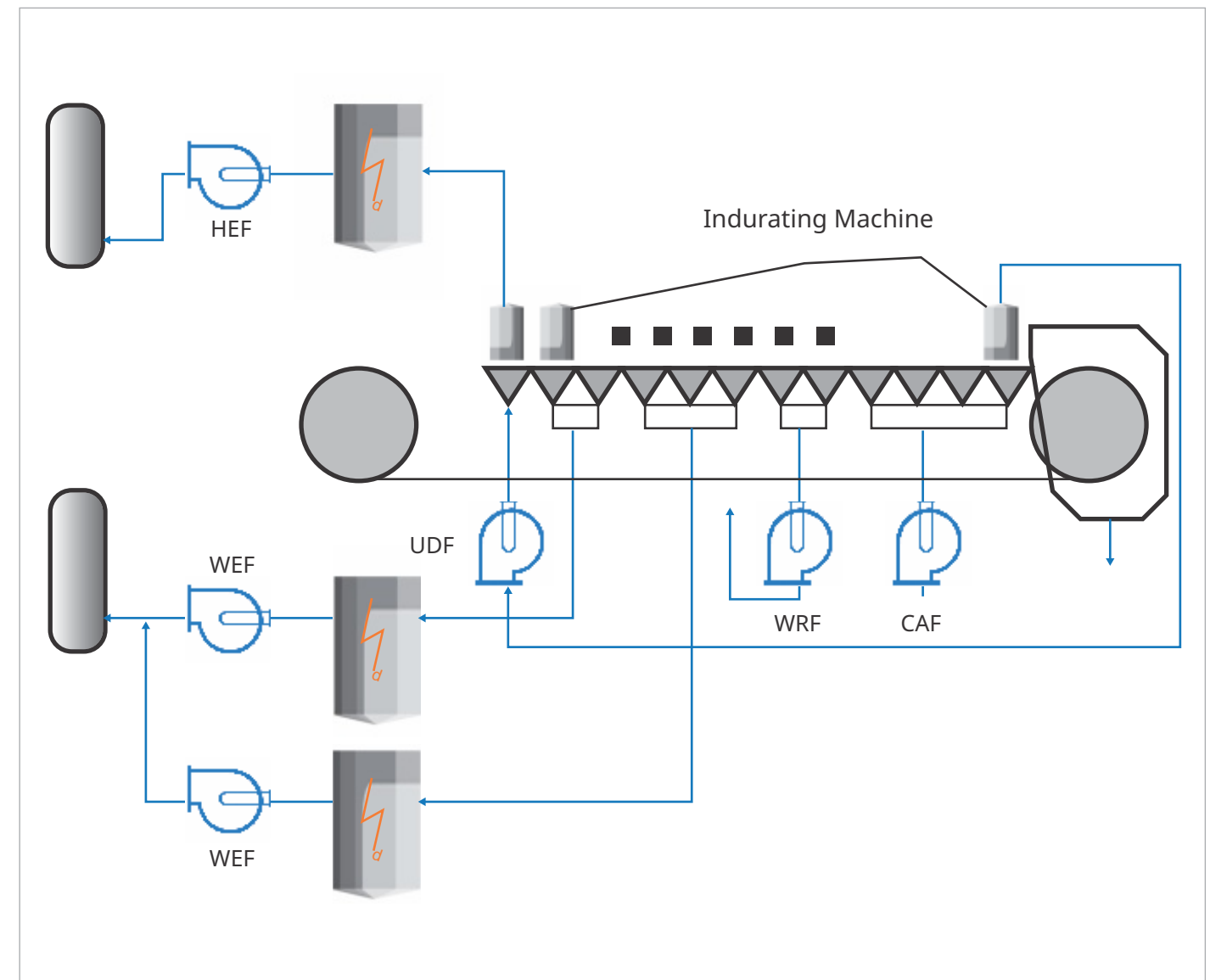
- ▶ Volume flow 130 – 607 m³/s
- ▶ Temperature 25 – 40 °C
- ▶ Pressure increase 6,000 – 9,400 Pa
- ▶ Shaft power 1,100 – 5,000 kW

Special Features:

- ▶ Designed for high volume flows and ambient temperature
- ▶ Double inlet centrifugal fan with aerofoil blades or axial impulse fan



Pelletizing Plant Scheme



Pelletizing Plant

WRF - Windbox Recuperation Fan

Technical Data:

- ▶ Volume flow 401 – 766 m³/s
- ▶ Temperature 300 – 400 °C
- ▶ Pressure increase 6,300 – 8,700 Pa
- ▶ Shaft power 3,200 – 7,600 kW

Special Features:

- ▶ Handles hot process gas (300-400 °C)
- ▶ Protected by hard-surfaced liners



Pelletizing Plant MBA Brazil

UDF - Updraught Drying Fan

Technical Data:

- ▶ Volume flow 210 – 560 m³/s
- ▶ Temperature 250 – 400 °C
- ▶ Pressure increase 6,400 – 8,500 Pa
- ▶ Shaft power 1,700 – 5,400 kW

Special Features:

- ▶ Draws process gas (250-400 °C) from the hood above the second cooling zone into the updraught drying zone
- ▶ Protected by hard-surfaced liners



Pelletizing Plant

WEF - Windbox Exhaust Fan

Technical Data:

- ▶ Volume flow 350 – 608 m³/s
- ▶ Temperature 50 – 300 °C
- ▶ Pressure increase 6,400 – 8,500 Pa
- ▶ Shaft power 3,000 – 7,060 kW

Special Features:

- ▶ Installed behind filter with lower dust content (ca. 100 mg/m³)
- ▶ Double inlet fans with backward-curved blades
- ▶ Protected by hard-surfaced liners



Furnace - Landschaftspark Duisburg

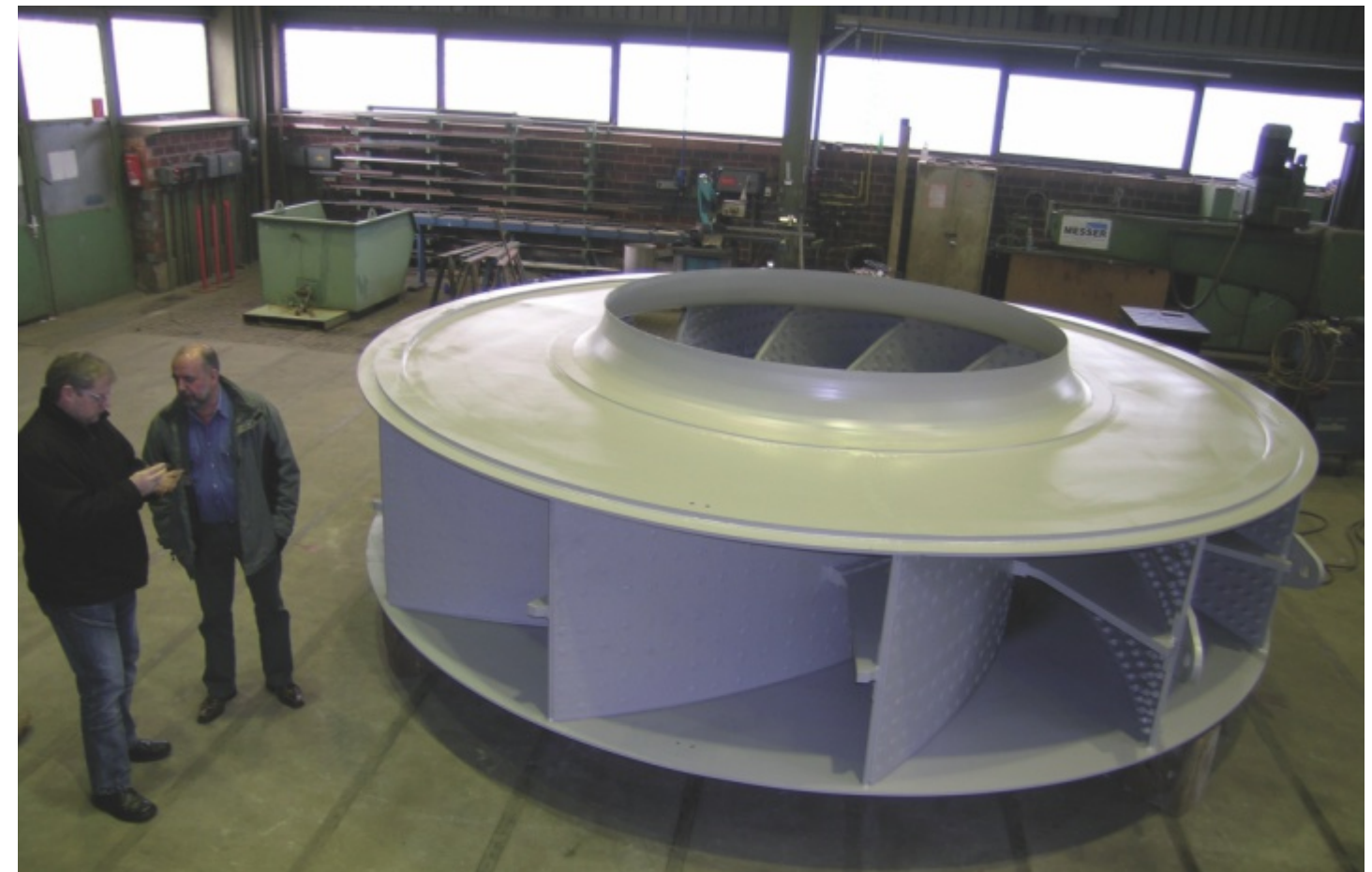
HEF - Hood Exhaust Fan

Technical Data:

- ▶ Volume flow 600 – 635 m³/s
- ▶ Temperature 150 – 160 °C
- ▶ Pressure increase 6,300 – 10,400 Pa
- ▶ Shaft power 1,700 – 7,100 kW

Special Features:

- ▶ Similar design features as the windbox exhaust fans
- ▶ Protected by hard-surfaced liners
- ▶ An axial flow fan would also be possible (only without wear protection)



Pelletizing Plant MBR Brazil, Windbox- Recuperation Fan, Diameter: 5400 mm

Sinter Waste Gas Fan

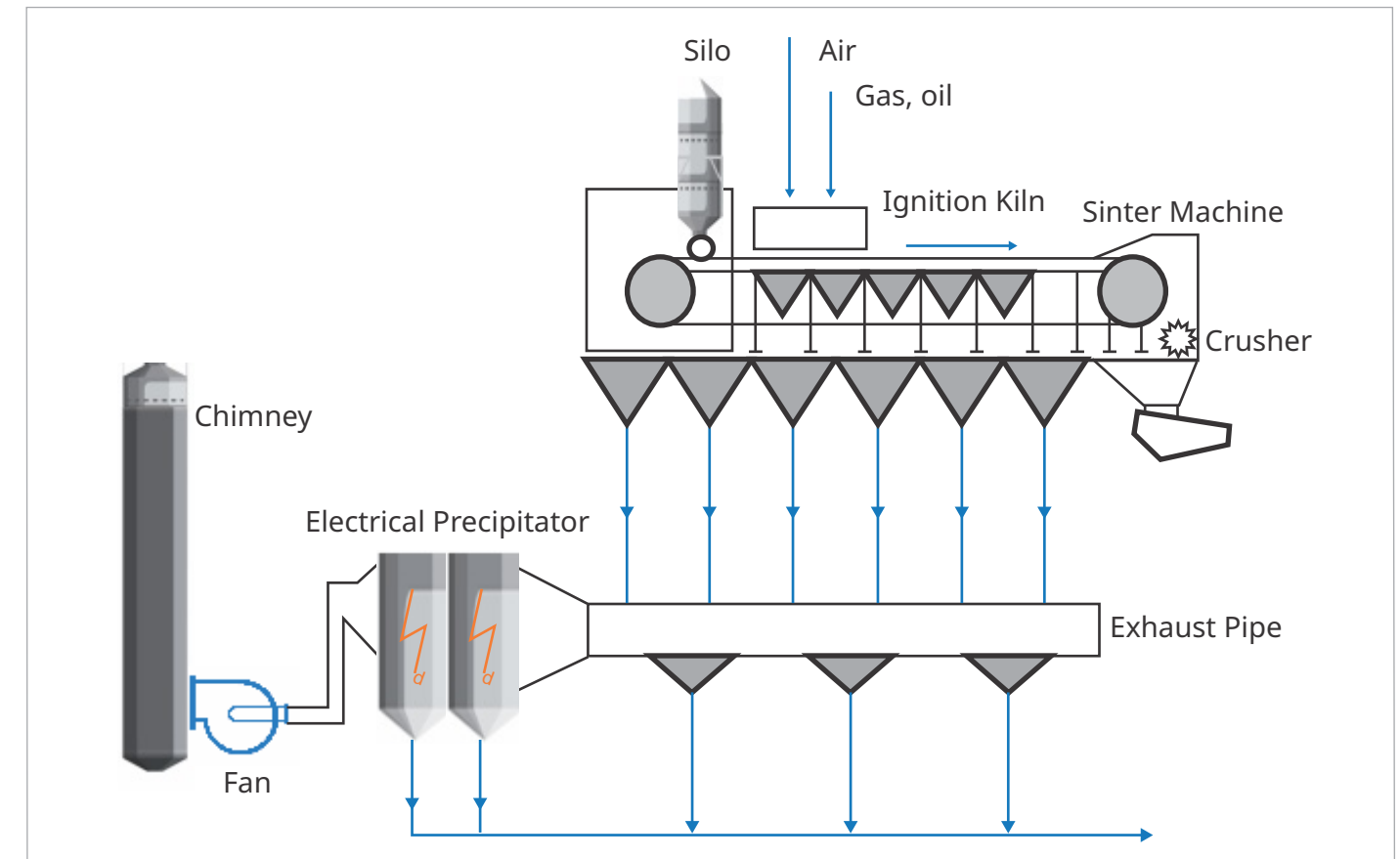
Technical Data:

- ▶ Volume flow 370 – 500 m³/s
- ▶ Temperature 120 – 200 °C
- ▶ Pressure increase 15,000 – 20,800 Pa
- ▶ Shaft power 5,000 – 11,150 kW

Special Features:

- ▶ Draws the process gas (120-200 °C) through the sinter machine and electrical precipitator to the stack
- ▶ The gas contains highly abrasive dust (ca. 50-100 mg/m³)
- ▶ The double suction impeller is equipped with wear protection in form of hardsurfacing

Sintering Plant Scheme



Landschaftspark Duisburg



Converter with Wet Cleaning Application

Converter Waste Gas Fan Designed as a Centrifugal Fan

Waste Gas Fan

Technical Data:

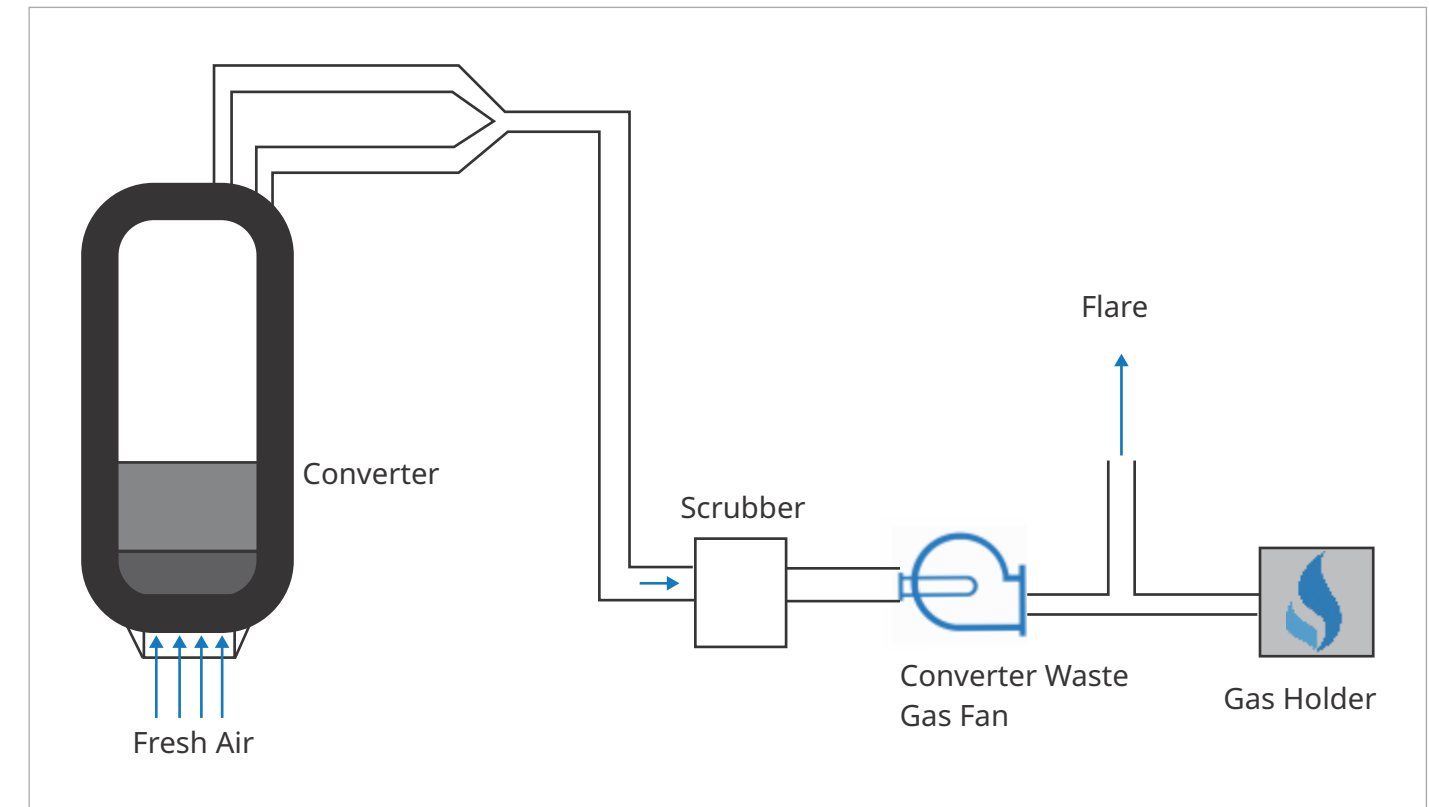
- ▶ Volume flow 50 – 60 m³/s
- ▶ Temperature 60 – 70 °C
- ▶ Static pressure 20,000 – 28,000 Pa

Special Features:

- ▶ Dust loaded with 1 g/m³ (build-up and wearing)
- ▶ Gastight application, 52-66 % CO gas
- ▶ Blade and main disc of the impeller are equipped with wear protection
- ▶ Spiral of casing with additional wear protection
- ▶ Rotor designed for 35,000 load-cycle changes
- ▶ Impeller with water cleaning system
- ▶ Fan control: speed control via VFD



Converter with Wet Cleaning Application Scheme



Converter with Dry Cleaning Application

Converter Waste Gas Fan Designed as an Axial Impulse Fan

Waste Gas Fan

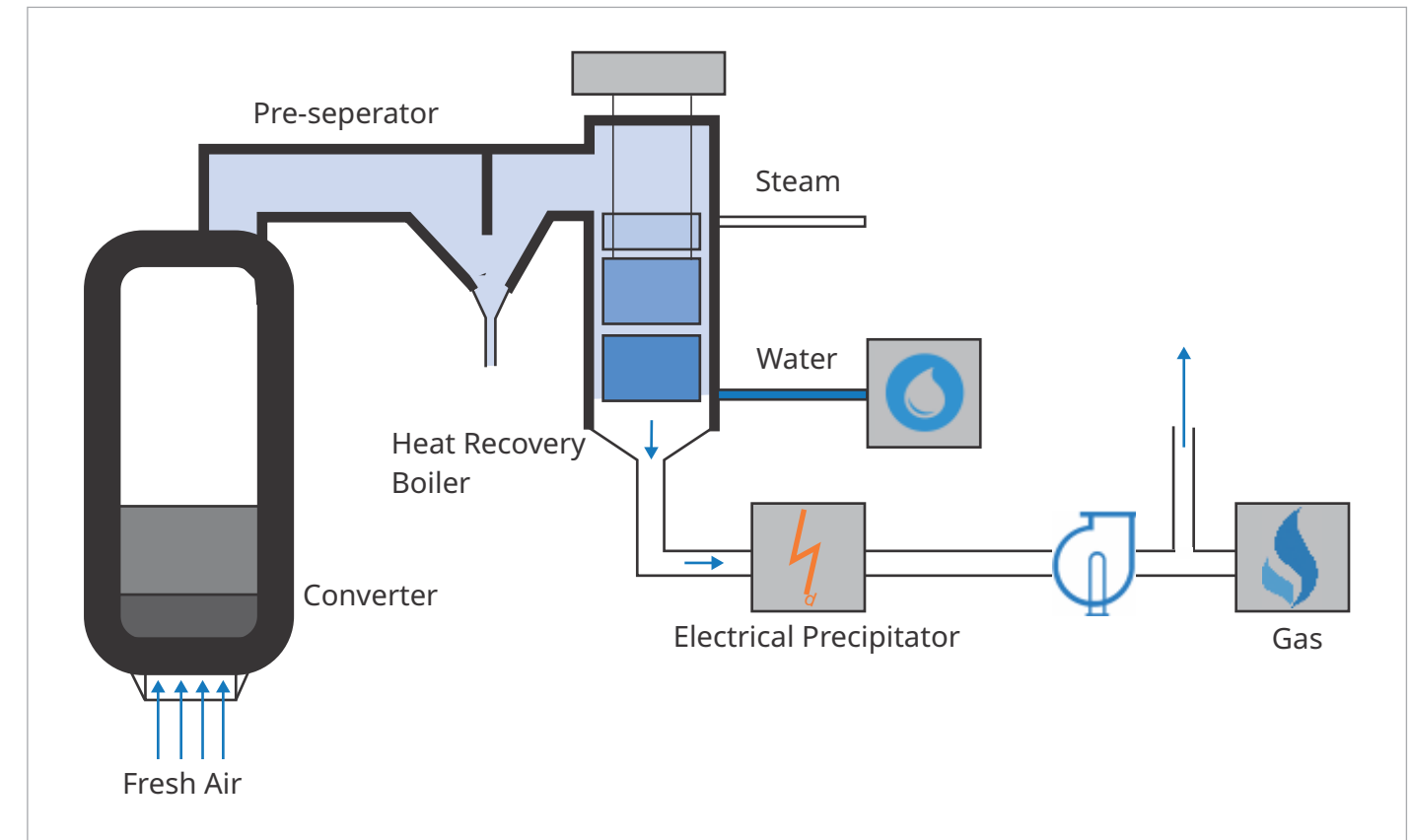
Technical Data:

- ▶ Volume flow 30 – 170 m³/s
- ▶ Temperature approx. 150 °C
- ▶ Static pressure 6,000 – 9,000 Pa

Special Features:

- ▶ Designed as „Axial Impulse Fans“ because of possible deflagrations in the plant
- ▶ Based on the deflagrations the stator parts are designed for a overpressure of 1.5 bar
- ▶ Higher tightness against the ambient area because of toxic parts in the gas composition

Converter with Dry Cleaning Application Scheme



Coke Dry Quenching System

Coke Gas Recirculation Fan

Technical Data:

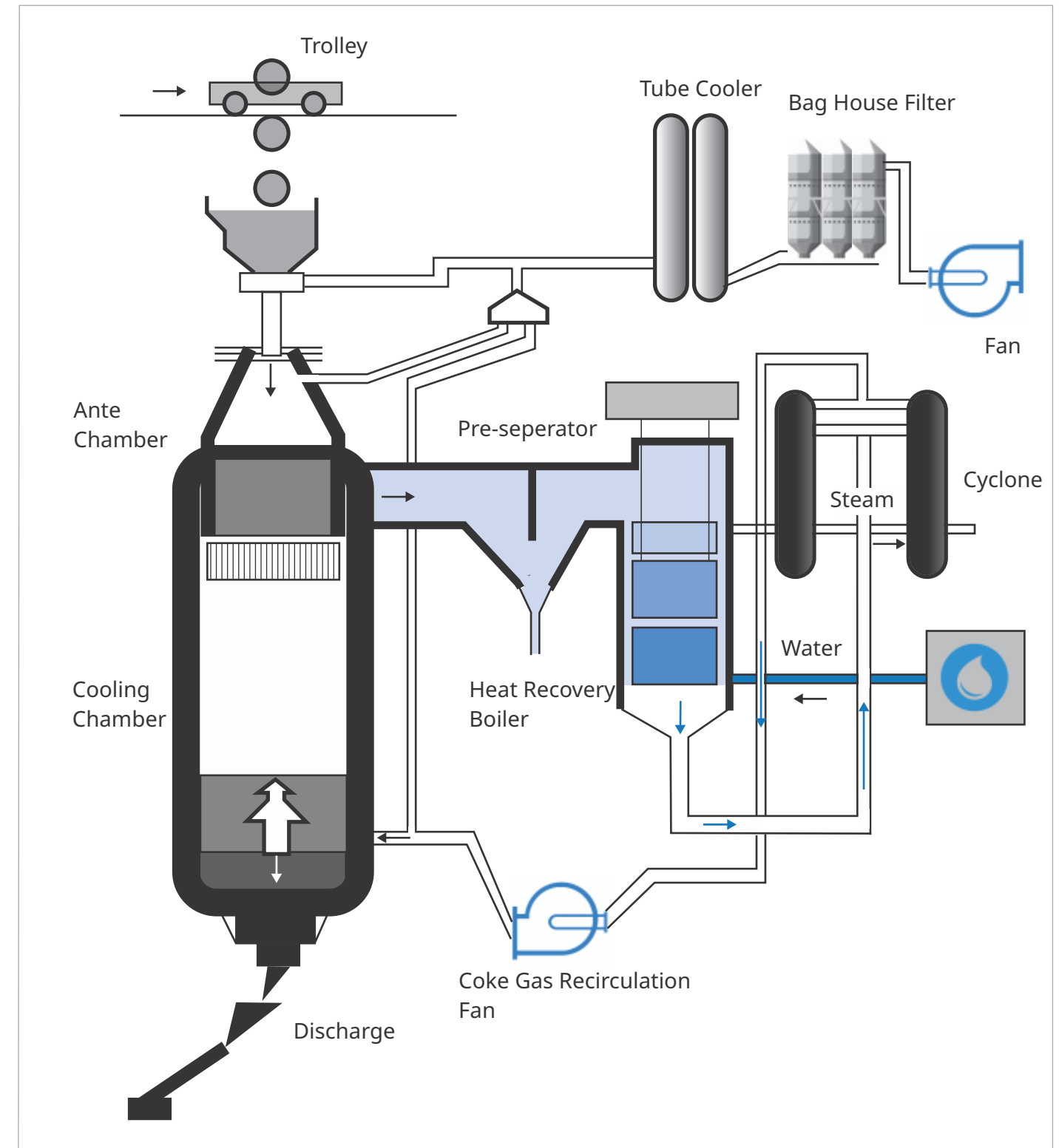
- ▶ Volume flow 50 – 100 m³/s
- ▶ Temperature approx. 175 °C
- ▶ Static pressure 10,000 – 14,000 Pa

Special Features:

- ▶ Designed as centrifugal fans with wear protection on impeller and housing to protect the fan against the abrasive coke dust
- ▶ Operation behind cyclone
- ▶ Mostly double width, double inlet design, with impeller supported on both sides on an elevated concrete foundation
- ▶ These fans are controlled by speed and also by inlet damper

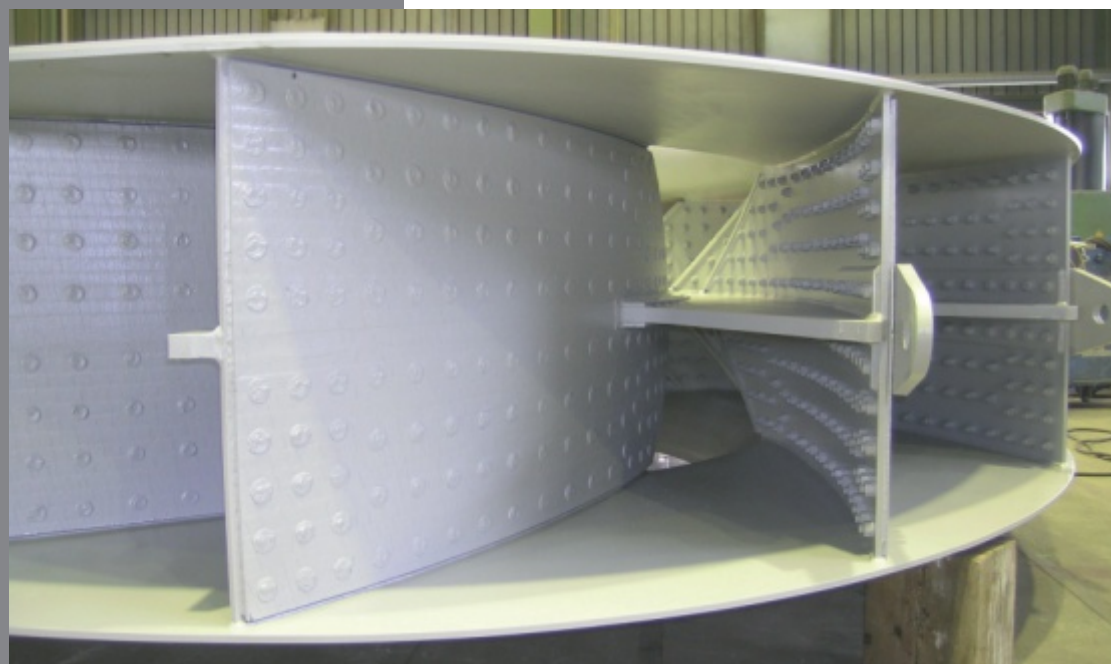
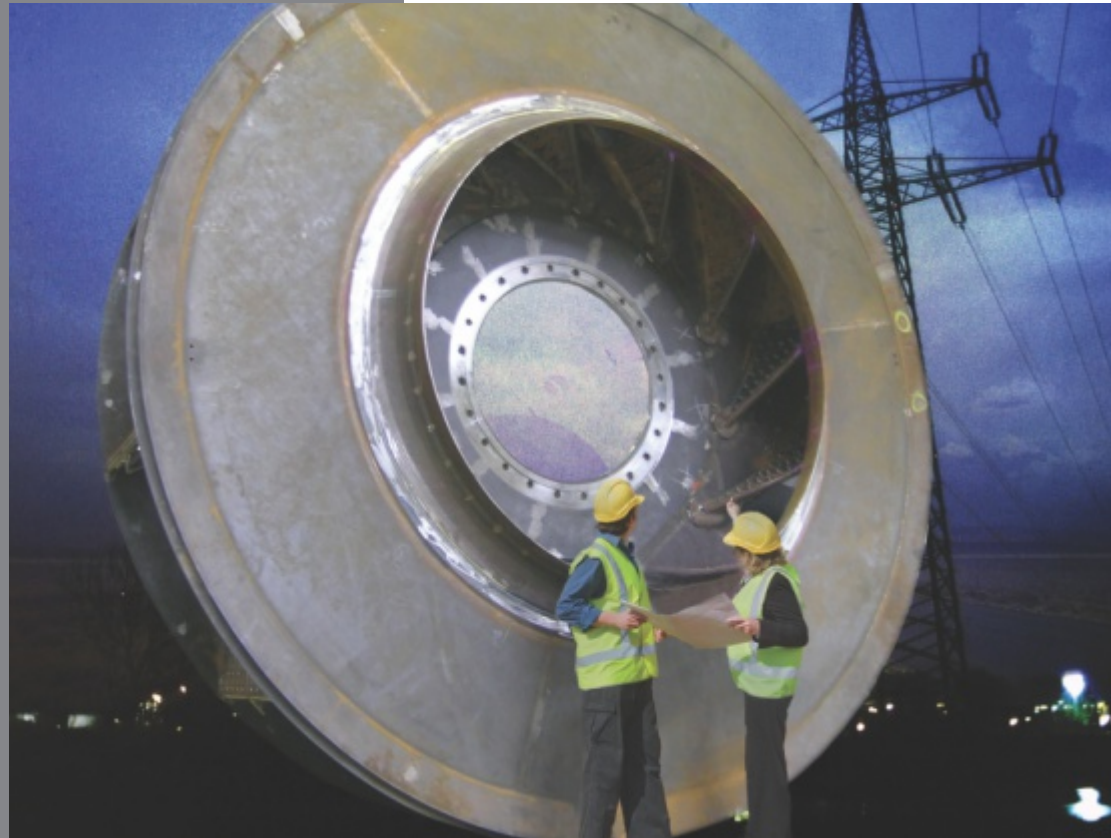


Coke Dry Quenching System Application Scheme



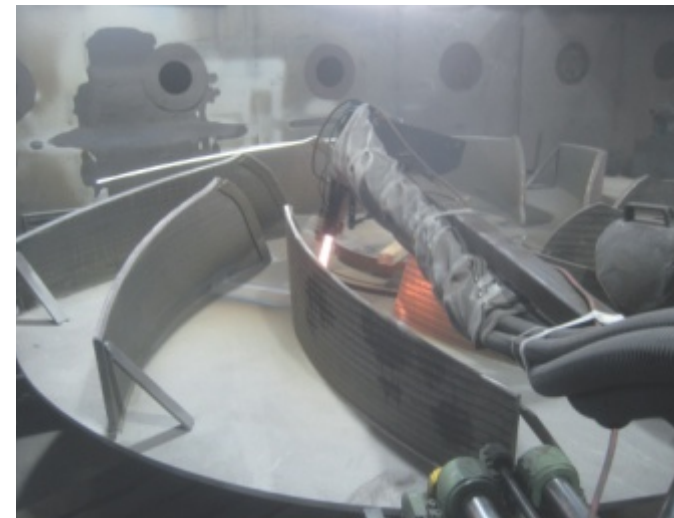
Wear Protection

- ▶ Exchangeable compound plates (hard-facing plates)
- ▶ Surface hardness: approx. 61 – 63 HRC
- ▶ Combination of compound plates with thermal sprayed load disk
- ▶ Surface hardness of thermal spraying layer approx. 70 – 75 HRC



Factors that Contribute to Less Wear

- ▶ 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



TLT-Turbo Measures Against Wear

Measures against wear due to dust:

- ▶ Use of optimal backward curved steel plate blades
- ▶ Installation of wear protection with a hardness up to 75 HRC
- ▶ TLT-longlife-thin layer tungsten carbide protection (HVOF - TLT H101)



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



○ Business Location with Manufacturing and Service Workshop

● Business Location

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TLT-Turbo

a company of  POWERCHINA

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