

# OBJECT

Teckentrup Doors

# REPORT

**OBJECT**

**Pulp mill Stendal**

**650 doors installed in just 18 months.**

**A sophisticated concept for an industrial plant with a highly complex infrastructure.**



WE OPEN THE DOORS FOR PROGRESS



## OBJECT

## Pulp mill Stendal

### EUROPE'S MOST ADVANCED PULP MILL

#### The ultimate industrial complex

Zellstoff Stendal GmbH in eastern Germany is Europe's most advanced and largest pulp mill. At full capacity the mill can produce up to approx. 570,000 metric tons of high-quality pulp each year. This pulp is subsequently used to produce, e.g., printing and sanitary paper.

At full output the plant requires approx. 9,000 solid cubic metres of timber daily. This raw material is delivered daily by more than 500 trucks from areas in eastern and southern Germany within a radius of approx. 300 kilometres. Besides road and rail access to the plant, the River Elbe offers a third channel of supply.

Thanks to the application of state-of-the-art water and air pollution control technologies, the environmental impact has been reduced to an extremely low and unparalleled level. An on-site thermal power plant supplies the required energy.



#### Requirements

Occupying an approx. 1 million square metre site, 44 buildings with a highly complex infrastructure were constructed simultaneously. The entire door concept had to be individually adapted to various safety functions, extremely difficult installation situations and last minute alterations on-site. A particularly high level of flexibility, perfect teamwork, close cooperation with planners and developers and interdisciplinary tasks were necessary. Creative and fast action was demanded of Teckentrup, in particular during the design and production stages, in order to meet the familiar high quality demands in spite of the short delivery periods.

#### Realization

The sophisticated project required a particularly competent partner. Teckentrup was responsible for all 44 buildings with up to 50 building units per structure. After each construction progress, the dimensions, materials and actual versions of the sophisticated door system had to be regularly revised in close cooperation with the project management. Project planning went smoothly due to a web-based support solution. The Teckentrup team paid regular visits to the construction site and was able to ensure delivery periods of approx. 3 weeks due to its extensive technical know-how and reliability and integrity with regard to approval details. This ensured that the entire complex was completed in just 18 months.

#### Complex design

Approximately 600 doors, 40 roller shutters and 19 folding doors as well as sectional and sliding doors carry out various tasks in the complex infrastructure and support trouble-free operation. All the doors were individually adapted to each component according to the various installation and material situations, such as sand-lime brickwork, reinforced concrete or trapezoidal sheet metal. In extreme cases, the left-hand wall connection was of a different material to the right-hand one. Special solutions in almost every shape and size with various functions, incl. fire and smoke protection or special stability, were realized.

# 650 doors for 44 buildings



## Functional building architecture

The optical appearance of the doors was carried out on the basis of a clear creative design which reflected the corporate design of the company. With just a few exceptions, all the doors at the building site were painted with RAL 1006.

Furthermore, all the doors were fitted with typical windows, kick plates and identical door latches. The doors were also equipped as standard with a weather board which protects them against driving rain.



## Everything from just one source

Teckentrup completely satisfied all the demands from development to production with its expertise and years of experience. Teckentrup multi-purpose doors, security doors, transformer doors and emergency exit doors were installed at the complex site. Special Teckentrup roller shutters and sliding, sectional and folding doors secure entrances and exits during tough, rigorous



daily operations. Very rarely is a door "off-the-shelf". At the fire station, for example, large sectional doors negotiate the permanently installed air conditioning and cable ducts which block upward travel. The sectional doors initially slide upwards before being guided away from the wall and into the hall. In spite of their size, they can be opened manually in emergency situations. The entrances to the fire station hall are equipped with weather-proof Teckentrup multi-purpose doors.



All the roller shutters are fitted with glazed strips at eye level to enhance safety. The strips ensure that people or vehicles are always visible on the other side.

# All construction stages realized at the same time

## Preventive fire protection for the oxygen plant

A double-leaf T90 sliding door provides smoke and fire protection in the oxygen generation building. The retractable seal at the header and the floor additionally satisfies the sound insulation requirements. The seal is extremely durable since it does not rub on the floor when opening and closing the door.

## Special folding door with integrated crane rail

The most complicated construction was installed in the digester house. At a height of roughly 30 metres there are three inspection openings via which wear parts can be replaced as part of the preventive maintenance measures. Specially designed four-leaf folding doors were installed at the openings under very difficult conditions.



Besides the complex modifications to the crane rail girders, the enormous wind speeds at this height had to be taken into consideration.



## Special dimensions – extremely wide and high

In some of the buildings, the actual size of the doors is very impressive, to say the least. In the “boiler feed-water treatment” building the doors are, e.g., 12 square metres (3 x 4 m) in size.

And the double-leaf doors leading to the barking plant are even more striking at 4.47 x 2.50 metres. They have been specially designed with three hinges and multi-locking and provide additional sound insulation.



The chipping facility placed even greater demands on the sound-proofing. The sound insulated door dw 105-2/5 ensures the required sound insulation (image above). Thanks to its special seal it achieves a sound insulation value of  $R_w = 55$  dB (assessed sound insulation measurement).

## Highest stability required

No matter whether in the boiler house, the lime kiln, the digester house or the power plant, the stability, safety and durability requirements were extremely high throughout the entire building complex. Burglar-resistant, heat-insulated Teckentrup dw 42 multi-purpose doors made of 1.5 mm thick sheet steel and smoke-proof T30 steel doors were generally installed. Top quality materials and technologies guarantee the greatest protection and ensure reliable logistics.



# Functional and technological diversity



## Multi-functional protection via transformer doors

All parts of the building that contain technological equipment are protected with special single and double-leaf burglar-resistant transformer doors. The robust, penetration-proof aluminium ventilation grilles ensure correct ventilation of the halls. The ventilation cross-section depends on the heat output and is dimensioned according to the required air exchange.



## Secure escape routes

The boiler house, an approx. 80 metre high building, is a real eye-catcher. In order to provide protection in case of an emergency, the T30 doors to the boiler house are smoke proof and equipped with a panic function. The fire protection is exemplary: The first escape route leads into an internal stairway.



## A patented system

A large number of the multi-purpose and fire protection doors were installed in exposed masonry with concealed frame assembly, but without the need for welding. The Teckentrup patented assembly method for the attachment of corner and closed frames was applied and can be seen here in

the pulp drying area. The frame is fixed with a special anchor, but can be easily adjusted and is just as robust as conventional wall anchor assembly. This technology is approved for fire protection doors and is particularly time saving and facilitates an unbroken frame surface without anchor points.



The second escape route to an external steel stair tower via a bridge. The entrances are equipped with fire-resistant steel doors to DIN standards.

# Building details at a glance

Construction facts	Data
Constructor	Zellstoff Stendal GmbH, Arneburg
Investors	Mercer International Inc., RWE Industrielösungen GmbH, FAHR Beteiligungs AG
Architects	Hochtief Construction AG, Düsseldorf
Construction management	RWE Industrie-Lösungen GmbH
General contractor	Hochtief Construction AG (branch offices Düsseldorf, Hamburg, Hanover)
Construction time	23 months, foundation stone laid on: 26 August 2002
Planned annual production 2006	570,000 mt
Product	Total chlorine free (TCF) and elementary chlorine free (ECF) long fibre kraft pulp
Raw material needs	2 million solid cubic metres of round wood, 1 million solid cubic metres of chippings – corresponding to approx. 9,000 solid cubic metres per day
Employees	580 employees, including 30 apprentices 2,500 workers employed at peak times during the construction phase
Power supply	Generation of energy via an on-site bio-fuel power plant based on combined heat and power
Certification	PEFC – Program of the Endorsement of Forest Certification



The numbers correspond to the various plant areas:

- ❶ Chip storage and chipping facility
- ❷ Digester house and bleaching plant
- ❸ Dewatering and drying plant
- ❹ Finished goods warehouse
- ❺ Liquor line
- ❻ Water and wastewater treatment facility

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