



# ULTIMATE INDUSTRIAL COMPLEX

## Pulp Mill Stendal

650 doors installed in just 18 months. A sophisticated concept for an industrial plant with a highly complex infrastructure. 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.



## The task

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.



## The solution

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.

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.

**Everything from just one source.**

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.



**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.





### 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. 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 fourleaf folding doors were installed at the openings under very difficult conditions.



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 multilocking and provide additional sound insulation.



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.



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.



**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 fourleaf 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.



**Secure escape routes.**

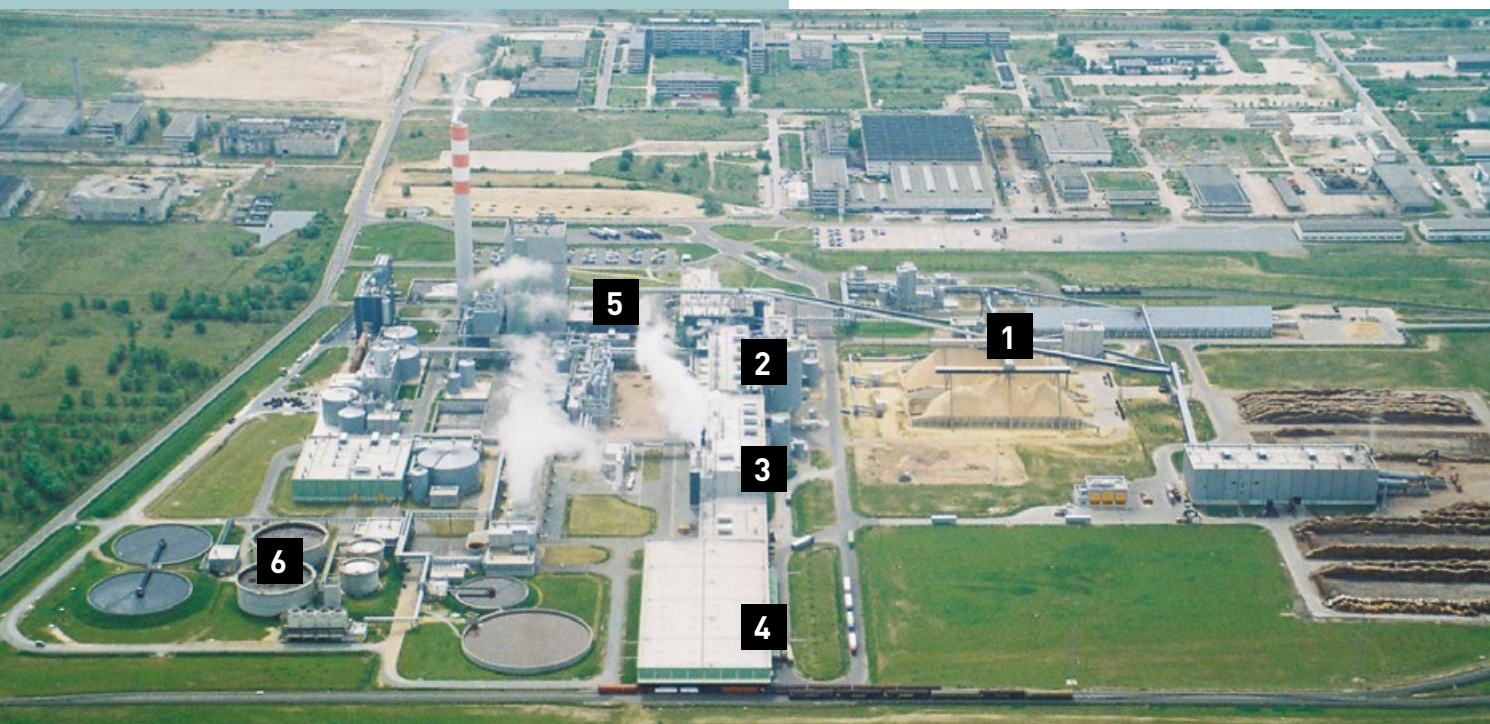
The boiler house, an approx. 80 metre high building, is a real eye-catcher. In order to provide protection in case of an emergency, the T30 doors to the boiler house are smoke proof and equipped with a panic function. The fire protection is exemplary: The first escape route leads into an internal stairway.



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.

**Construction Board**

Constructor	Zellstoff Stendal GmbH, Arneburg
Architets	hochtief Construction AG, Düsseldorf
Construction time	23 months, foundation stone laid on 26 August 2002
Product	Total chlorine free (TCF) and elementary chlorine free (ECF) long fibre kraft pulp
Power supply	Generation of energy via an on-site bio-fuel power plant based on combined heat and power



1 Chip storage and chipping facility | 2 Digester house and bleaching plant | 3 Dewatering and drying plant | 4 Finished goods warehouse | 5 Liquor line | 6 Water and wastewater treatment facility

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