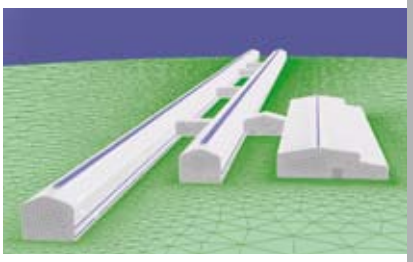
COLT TECHNOLOGY BV

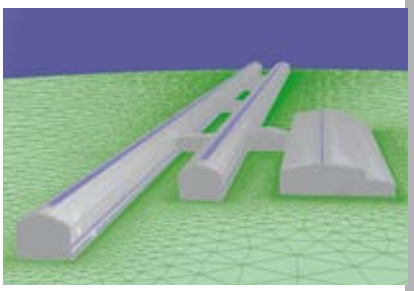
Colt Technology BV, an independent consultancy within the Colt Group, was commissioned to investigate the problem by Aluminium Delfzijl. Colt Technology was approached at an early stage and asked to evaluate all the available options. Colt Technology not only took measurements and carried out calculations, but also carried out physical tests on the equipment at Colt's own R&D centre. Colt Technology calculated the required capacity of the system and recommended a natural ventilation system where warm air is displaced by a natural supply of fresh air.

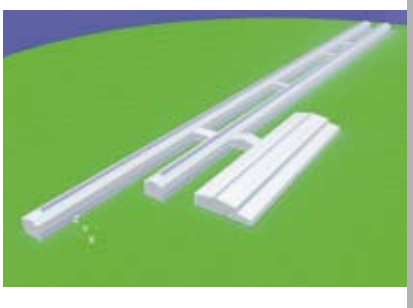
WELL REGULATED AND EFFICIENT

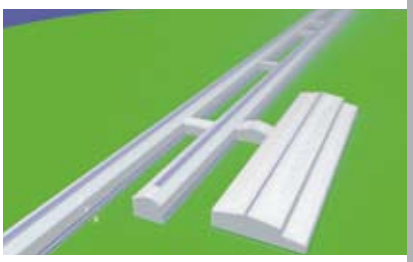
The Colt natural ventilation system chosen by Aluminium Delfzijl uses a Labyrinth natural ridge ventilator in the roof and FCO louvred ventilators in the side walls. This combination provides sufficient air displacement in the production halls to ensure the required reduction in temperature. The louvres of the FCO can be closed to prevent the entry of rain through the side wall vents. The Labyrinth is specially designed to prevent water entry. Additionally, the Labyrinth has no moving parts, which means that it is not affected by the strong sea wind. These Colt systems are manufactured from high-quality "Colterra" recycled aluminium that is not only lightweight but also resistant to sea water.

Retrofit project manager F. Vermulst confirms that the system completely satisfies the client's requirements: "Because the system is easy to regulate, the interior climate within the production halls can be adapted to suit all weather conditions. Even during the summer, we have no problem complying with all legal standards. In fact, we save money because the electricity costs have been reduced. The Labyrinth has proven to be totally watertight. Other companies like ours throughout the world potentially face the same kinds of problems, and international interest has been overwhelming since the new system was installed."









Colt International
www.coltgroup.com

COLT

Europe's longest natural ventilation system at Aluminium Delfzijl!

Natural ventilation

Europe's longest natural ventilation system at Aluminium Delfzijl!

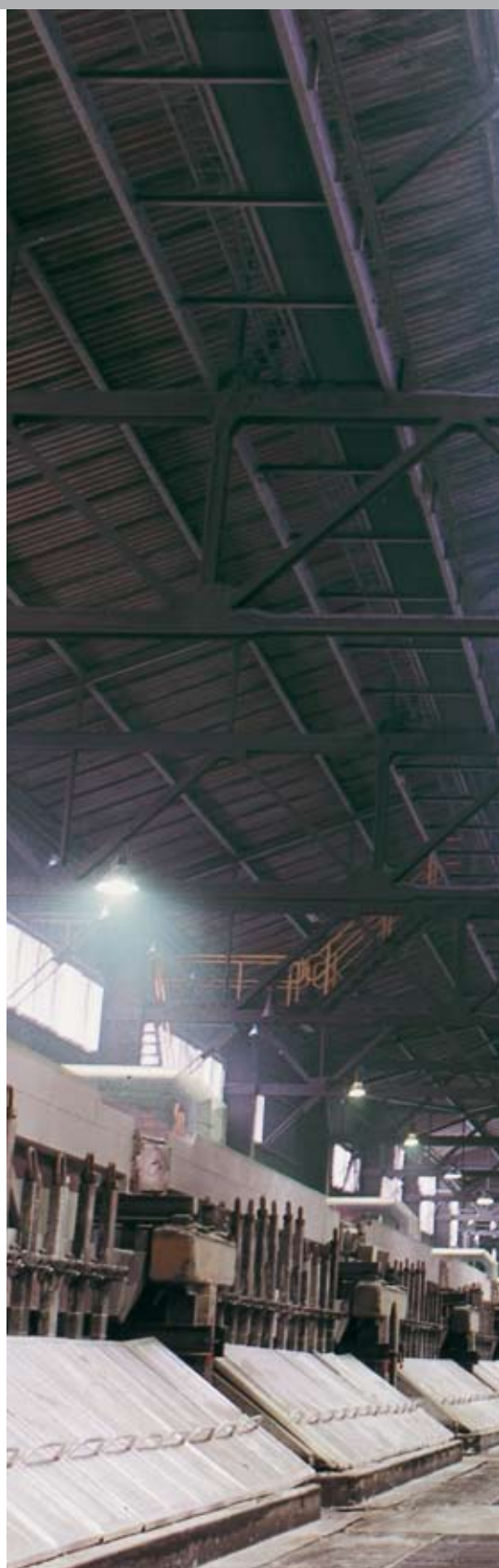
Aluminium Delfzijl, as the name suggests, is located in Delfzijl on the mouth of the river Ems in the extreme North of the Netherlands. There are few companies in the world that produce aluminium from alumina in such large quantities. The enormous smelters produce 100,000 tonnes of aluminium per year. There are two production halls which are respectively 850 and 950 metres long, indeed so long that the employees use bicycles to get around.

The process releases an enormous amount of heat, which must somehow be removed.

For this purpose Colt has provided a natural ventilation scheme that covers the total 1,800 metres of length of the two buildings. Aluminium Delfzijl has the longest natural ventilation system in Europe. It is therefore not surprising that Colt's solution has attracted considerable interest.

In 1964 Hoogovens (now Corus), Billiton and Alusuisse decided to build the first aluminium smelter in the Netherlands. Delfzijl was chosen for two reasons. One was that natural gas was discovered in the North of the Netherlands, which meant inexpensive energy. The other was that the raw material, whether alumina or purified bauxite, is shipped from Surinam, and Aluminium Delfzijl has its own shipping terminal. Production started in 1966.

Enormous amounts of electricity are required to extract aluminium from alumina. Aluminium is produced by electrolysis in the smelters at well in excess of 900°C. There is a continuous process where a cathode in the bath attracts the aluminium in the alumina, from where it is subsequently tapped off. At Aluminium Delfzijl, approximately 500 employees produce high-quality aluminium that is delivered as a semi-finished product in the form of billets and slabs.



A CHALLENGING HEAT EXTRACTION PROBLEM

The demand for aluminium increases daily and it has innumerable uses, ranging from aluminium foil to components for the automotive and aviation industries. This was reason enough for Aluminium Delfzijl to implement a large-scale modernization programme several years ago that has replaced plant that had been in use for 30 years. The programme was known as “Retrofit” within the company and involved a large number of improvements to the production processes as well as improvements in working conditions. The replacement of the heat extraction system in the production halls was part of this initiative. The existing mechanical ventilation system consumed 2,000 kWh and was no longer effective. However its replacement was no simple matter since the problem was complex and the requirements were demanding:

1. The amount of heat generated in the production areas was extremely high, but the ambient temperature had nonetheless to remain below a certain maximum.
2. No rain, snow or sleet could be allowed to enter into the production areas. Any moisture can become life threatening in this environment, both for the production process and for the safety of the employees who work with high electric currents and voltages.
3. The strong North Sea wind could not adversely affect the ability of the ventilation system to operate.