

# ENVIRONMENT AND PROCESS

## Business Area Managers



**COMPREHENSIVE PRODUCT  
PORTFOLIO FOR MECHANICAL AND  
THERMAL SOLID/LIQUID SEPARATION.**

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**[1]** The five HBF pressure filtration lines, each with 168 m<sup>2</sup> filter surface, supplied by Andritz to Alunorte do Brasil, Barcarena, Brazil were started up in 2007 and are in full operation. The plant dewateres over 700 m<sup>3</sup> of bauxite suspension per hour, from between 50 and 60% to over 85% dry solids.

**[2]** Palm oil has become one of the most popular oils for cooking and for industrial food processes. Andritz palm oil filter presses are used to separate olein and stearin to meet different product specifications.

**[3]** Andritz built the world's largest sludge dryer for the cement industry, in Karlstadt, Germany. The waste heat from the cement factory is used for drying, and the dried sludge is used as fuel in the factory. The entire mineral portion is integrated in the cement. Thus, the sludge is sustainably reused, leaving behind no waste.

**[4]** The belt dryer developed by Andritz 3Sys is designed for optimum recovery of waste heat. The photo shows the plant in Karlstadt.



[1]



[2]



[3]



[4]

## PROFILE

The Environment and Process Business Area covers a comprehensive range of technologies, products, and services for mechanical and thermal solid/liquid separation for municipalities and major industries, such as coal and mineral processing, chemical/petrochemical, and food processing.

The Business Area is a global leader in this field and offers comprehensive support, from design to the manufacture of key components for thickening, dewatering, drying, and incineration, as well as erection and start-up of turnkey plants, including automation and safety engineering.

The large installed base of Andritz products and systems, including more than 10,000 centrifuges, more than 10,000 filter presses, and over 100 sludge drying lines worldwide, is serviced from more than 15 dedicated Andritz service centers in Europe, the Americas, Asia, South Africa, and Australia.

## MARKET DEVELOPMENT

During 2007, the market for sewage sludge dewatering equipment developed very solidly, especially in Asia and the USA.

Project activity for industrial applications for the petrochemical, minerals, mining, and food processing industries was very high in most regions of the world. In parallel, the demand for dewatering equipment to treat industrial sludges remained at a very high level.

Project activity for sludge drying plants mainly focused on the UK, Turkey, the Arabic States, and Southeast Asia. Due to rising fuel prices, the demand for refurbishments of drying plants with combined heat and power solutions, heat recovery, and plants with combined incineration has developed favorably.

The rising demand for alternative fuel sources has resulted in orders for dewatering of residues from bioethanol production and in high project activity for equipment and systems to dry various sorts of biomass, specifically wood chips and sawdust, as well as sugar cane bagasse for the production of pellets.

## BUSINESS DEVELOPMENT

In 2007, Sales of the Business Area amounted to 364.5 MEUR, which is a slight decrease compared to 2006 (366.5 MEUR). In particular, the Separation Technologies Division showed a very solid Sales development during the reporting period.

EBITA of the Business Area increased to 25.3 MEUR in 2007, up 23.4% compared to 2006 (20.5 MEUR).

Order Intake in 2007 reached 346.9 MEUR, practically unchanged compared to the high level achieved last year (344.2 MEUR). While orders in the Separation Technologies Division continued to show good organic growth, Order Intake in the Thermal Process Technologies Division declined compared to 2006.

## KEY FIGURES ENVIRONMENT AND PROCESS

MEUR	2007	2006	2005	2004	2003
Sales	364.5	366.5	289.2	217.9	110.4
Order Intake	346.9	344.2	340.1	200.7	110.2
Order Backlog as of 31.12.	161.1	179.3	202.2	138.3	113.8
EBITDA	30.3	25.6	22.0	12.6	3.3
EBITDA margin	8.3%	7.0%	7.6%	5.8%	3.0%
EBITA	25.3	20.5	17.7	9.9	1.5
EBITA margin	6.9%	5.6%	6.1%	4.5%	1.4%
Capital investments	4.9	6.5	6.6	7.9	1.5
Employees as of 31.12.	1,350	1,324	1,213	926	428

## MAJOR ORDERS

### Separation Technologies

- Two large filter presses will be delivered for a titanium dioxide plant in the Ukraine.
- A total of six large filter presses for dewatering of kaolin was ordered by customers in Brazil.
- Four Hyperbaric Filters (HBFs) for fine coal dewatering will be delivered to the Ukraine and China.
- Three centrifuges with a diameter of 1,100 mm were sold to a customer in Saudi Arabia for dewatering of HDPE (High-Density Poly-Ethylene).
- Nine large centrifuges will be delivered to various plants worldwide for the production of melamine; four centrifuges were sold for a potash plant in Russia.
- A customer in Korea ordered four large centrifuges for the production of bisphenol. A similar plant in Taiwan will use the same type of centrifuges.
- The Division was awarded a contract to deliver six large screens for the storm water overflow system of the city of Detroit, USA.
- A gold washing company in Russia decided to look for a new filter press supplier and bought two large Andritz filter presses due to their superior reliability.

### Thermal Process Technologies

- Sodawerke Staßfurt, Germany ordered a 1,000 t/d fluid bed plant for conversion of light soda ash from the Solvay process to dense ash using Andritz's monohydrate process.
- The Division was awarded a contract to deliver a sludge drying plant with a water evaporation capacity of 4.9 t/h for the city of Antalya. This will be the first plant of its kind in Turkey.
- Schwenk Cement, Germany placed an order for a belt dryer plant with a water evaporation capacity of 10 t/h for Bernburg, Germany; this customer had ordered an 8 t/h plant for the Karlstadt, Germany factory in 2004.
- Ticona Germany, a company of the Celanese Group, ordered two fluidized bed dryers for POM, a specialty polymer. The planned extension of Frankfurt Airport contributed to this project as this is part of Ticona's plant relocation from Kelsterbach to Hoechst Industrial Park.
- A belt dryer plant with a water evaporation capacity of 3 t/h will be supplied for Radom, Poland; this is the first belt dryer order from Poland.
- A belt dryer with 8.15 t/h water evaporation capacity was sold to Nuh Cimento, one of the largest cement producers in Turkey.
- A major PVC producer in the USA placed an order for a turnkey fluid bed drying and cooling system for Suspension-PVC (S-PVC), including mechanical dewatering with Andritz Bird solid-bowl decanter centrifuges; the plant will be located in the Midwest of the USA.
- The city of Cape Coral, Florida, USA, ordered a drying system (2 lines with 5 t/h water evaporation) for its new wastewater treatment plant expansion. Similar plants have been constructed by Andritz in Florida at Jacksonville, Pinellas County, Hillsborough County, and Bonita Springs.

## RESEARCH AND DEVELOPMENT

Research work in the Separation Technologies Division continued to concentrate on the optimization of the centrifuge product range in order to further enhance performance and/or reduce manufacturing costs. Another focus area was the standardization of the filter press product family in order to shorten delivery times and reduce costs.

Driven by increasingly stringent requirements for highly efficient odor control systems, further efforts and tests have been conducted to minimize odor and TOC (Total Organic Carbon) compounds in the offgas from sludge drying plants. Especially for sewage sludge with its unpredictable range of odorous substances, extensive R&D work is done to develop a reliable and ecological odor control system that – unlike thermal oxidizers – does not consume further primary energy and cause additional pollution by CO<sub>2</sub>.

Based on the strong market demand for biomass drying, the development of a large-scale belt dryer for biomass with an evaporation capacity of up to 16 t/h has been started with the target to achieve utmost energy efficiency by heat recovery from drying gases. This dryer will operate with nearly closed drying air loops and also recover the energy from the minimized dryer offgas stream. It will be able to run on waste heat or offgas from other processes as well as from combined heat and power plants (CHPs).

Also with respect to biomass drying, intensive pilot tests were carried out with a pilot-scale drying plant to obtain design and feasibility data for belt drying on various biomass materials such as sawdust for pellet mills, spent grain from breweries, rejects, sugar cane bagasse, and bark from the pulp and paper industry. ○