SUCCESS STORY

A zero waste solution,
powered by big ideas
in Allmendingen, Germany

SEPARATION

CEMENTING SUSTAINABILITY

INTEGRATED PROCESS CUTS COSTS, EMISSIONS, AND CONSUMPTION OF RESOURCES WITH ANDRITZ DRUM DRYING TECHNOLOGY

ANDRITZ

ENGINEERED SUCCESS

The challenge

Reducing CO_2 emissions and cutting consumption of mineral-based fuel

Now in its fifth generation, the family-owned company Schwenk is a well-known cement producer in Europe and has been manufacturing cement in Allmendingen, Germany, since 1889. And here lies the paradox: the oldest production sites are often the most innovative. After all, as any successful firm knows, progress is essential if you want to survive – especially in one of the world's most energy-intensive industries.

In the highly resource-consuming cement sector, even small gains in efficiency can have a massive impact, considering that the cement industry worldwide contributes about 7% to global CO_2 emissions. And Schwenk has an innovative idea to reduce this figure – drying municipal sludge with the exhaust heat from the cement kiln and using it as a sustainable fuel source in downstream production. Given the firm's successful record with ANDRITZ, who had provided belt and paddle dryers for many other sites in Germany, Schwenk knew who to approach for a cutting-edge separation solution.

The plan was to use the hot flue gases from the kiln – which reaches temperatures of up to 400°C – to dry the sludge directly. The challenges here included foregoing the use of a heat exchanger and dealing with the high dust content from the raw cement mix in the gas. What's more, granulation of the sludge and the dust from the raw mix had not yet been tested when the project was started.

DDS 180, the largest drum dryer for sewage sludge anywhere in the world

Our solution

One of the world's largest rotary drum dryer for sludge treatment

For an economic operation, the drying plant needs to evaporate a minimum of 14 tons of water per hour. Unfortunately, space constraints in the existing building made it impossible to accommodate the two drying lines this capacity would normally require.

This is where the ANDRITZ solution really paid off: the DDS 180 is the largest drum dryer for sewage sludge built by ANDRITZ. With a diameter of 4.6 meters and 17 meters long, the DDS installed in Allmendingen achieves a dry solids content of 90% using only exhaust gas from the cement kiln as its heat source. The dewatered sludge is granulated in a mixer before being dried in the triple-pass drum (three concentric cylinders revolving around the same axis). Then the sludge is conveyed pneumatically by the stream of hot gases, delivering an evenly dried, pasteurized product.

As the result of 30 years' experience, the ANDRITZ convection drying process ensures that the final product is a CO_2-neutral fuel as substitute for primary energy and minerals (ash from the sludge). Teams from ANDRITZ in Ravensburg and Graz worked together to overcome the considerable challenges involved in transporting the huge dryer to the site and assembling it in an existing building.

Results

Massive cuts in OPEX and carbon emissions

Taking around three years from the initial enquiry to the finished solution, direct use of exhaust gas from the cement process in the ANDRITZ drum dryer has had a major impact. The drying process transforms the dewatered sludge into a valuable product that can be used in a residue-free process as a substitute for fuel and minerals. Not only has it eliminated the need for costly heat exchangers, it has also reduced annual raw fuel consumption by about 20,000 tons a year and slashed CO_2 emissions by nearly 30,000 tons as well.

The innovative approach to using dried sludge instead of primary fuel and minerals not only equates to a steady supply of affordable energy, but also shows what can be possible when two companies with a long history of expertise and innovation put their heads together.

"The ANDRITZ drum dryer has enabled us to achieve huge reductions in fuel, mineral and operating costs. As sludge is nearly CO_2 neutral, we have also seen a massive improvement in our carbon footprint. Even the ash left over from the process is reused as a valuable source of minerals. That means zero waste. And a truly circular economy."

JAN ALTHAMMER
Production Manager, Schwenk Allmendingen

WHAT'S YOUR SEPARATION CHALLENGE?

ANDRITZ Separation is the world's leading separation specialist with the broadest technology portfolio and more than 2,000 specialists in 40 countries. For more than 150 years, we have been a driving force in the evolution of separation solutions and services for industries ranging from environment to food, chemicals, and mining & minerals. As the OEM for many of the world's leading brands, we have the solutions and services to transform your business to meet tomorrow's changing demands – wherever you are and whatever your separation challenge. **Ask your separation specialist!**

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