Doosan Lentjes

PRESS KIT 2017

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Section 1:

About Doosan Lentjes

1. About Doosan Lentjes

A global technology provider

Doosan Lentjes is a global provider of processes and technologies for energy production from renewable and fossil fuels. The company's specific areas of expertise include circulating fluidised bed boilers, key technologies for the generation of energy from waste, and flue gas cleaning systems. Doosan Lentjes' technologies have been pioneering energy solutions for 90 years and convert millions of tons of waste into energy every year.

Doosan Lentjes is part of a powerful combination of companies united under the Doosan Group to deliver complementary technologies, skills and value to customers the world over.

Integrated solutions

Doosan Lentjes has a long history of project management experience. The company offers integrated customised solutions and expertise for the power generation industry from a single source. Solutions are synonymous with technological leadership and developed on the basis of a true understanding of individual customers and their business requirements.

Important dates

1928: Ferdinand Lentjes founds boiler manufacturing company

1982: Company designs, builds and commissions the world's first commercial CFB boiler

1984: Acquisition of Gottfried Bischoff GmbH, a specialist in flue gas cleaning technology

1989: Company acquires intellectual property from Kablitz GmbH, a specialist in grate firing technology

2011: AE&E Lentjes GmbH became proud member of Doosan Group to form Doosan Lentjes GmbH

2016: Doosan Lentjes celebrated the 40th anniversary of its CFB combustion technology

Part of the Doosan Group

As a member of the global Doosan Group, the energy generation technology specialist Doosan Lentjes provides the resources to deliver complete process solutions from one trusted source — making the company the one-stop partner for all energy generation requirements.

With Doosan's global network, Doosan Lentjes combines international market know-how with German state-of-the-art engineering — a winning combination for providing innovative solutions for customers the world over.

Doosan Lentjes benefits from the Group's international sourcing and manufacturing capabilities. High quality workshops under the full control of Doosan in Changwon/Korea, Chennai/India and Vina/Vietnam provide best practice procurement of goods and services while maintaining and ensuring compliance with laws, regulatory guidelines and internal control procedures. Procurement hubs in Beijing and Shanghai/China underline Doosan Lentjes' efforts for cost optimised solutions.

Top left and right: Changwon, Korea
Bottom left: Vina, Vietnam; bottom right: Chennai, India

Section 2:

Doosan Lentjes at a glance

2. Doosan Lentjes at a glance

Full company name and address

Doosan Lentjes GmbH
Daniel – Goldbach – Straße 19
40880 Ratingen
Germany

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dl.info@doosan.com
www.doosanlentjes.com

Board of management

Board of Management	Thomas Stetter, Chief Executive Officer
	Andreas Aschbacher, Chief Financial Officer

Areas of activity

Doosan Lentjes is a specialist in the development of technologies for efficient and sustainable power generation from both renewable and fossil fuels.

Products

Circulating fluidised bed boilers

Waste-to-energy technology

Air quality control systems

Media contact

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Section 3:

Power generation and Doosan Lentjes

3. Power generation and Doosan Lentjes

Our industry

The power generation sector is an essential service industry that uses a variety of technologies to produce electricity and or / heat for a range of municipal and industrial applications.

Driven by global population growth and industrialisation, the demand for energy continues to grow. However, governments and industry around the world now recognise that while this demand for energy must be met, power generation must be as clean as possible. As a result, new legislation is in force to limit emissions from thermal and fossil-fuel power stations. The aim is to reduce the emission of damaging elements such as sulphur dioxide, nitrogen oxides, and dust into the environment.

Our technologies

Doosan Lentjes is a specialist in the development of technologies for efficient and sustainable energy generation from both renewable and fossil fuels. The product portfolio includes circulating fluidised bed (CFB) boilers, waste-to-energy (WtE) technology and air quality control systems (AQCS).

Circulating fluidised bed boilers

Doosan Lentjes' circulating fluisided bed (CFB) boiler has been designed to enable the combustion of a wide range of fuel types, including those with low calorific and low reactive values, or fuels with a low ash melting temperature. With more than 110 successfully installed units worldwide, the CFB design guarantees a high level of flexibility – essential for the combustion of low quality fuels.

In order to deliver on EU emissions directives, an integrated emissions control system removes sulphur dioxide from the process by adding limestone, while a low combustion temperature prevents the formation of thermal NO_x.

Doosan Lentjes' CFB boiler technologies contribute to efficient and environmentally-friendly power generation to satisfy the increasing energy demand associated with increasing global economic growth.

Waste-to-energy

When recycling is not an option, the thermal treatment of residual waste is the final, indispensable stage of a modern and sustainable waste management concept. While reducing the waste volume by more than 90%, highest possible energy yields are generated. Simultaneously, harmful pollutants and toxins are reduced.

Doosan Lentjes' waste-to-energy technologies help to efficiently generate power from waste by simultaneously reducing waste volume. With more than 75 units contracted around the world equivalent to a total throughput of millions of tons of waste which are converted into energy every year, Doosan Lentjes ensures a reliable power supply for municipalities.

Focusing on the specific requirements of waste-to-energy plants Doosan Lentjes has developed a tailor-made flue gas cleaning system called Circoclean®, which is based on the company's proprietary circulating fluidised bed technology. By removing up to 99% of pollutants, the Circoclean® flue gas cleaning system ensures full compliance with all emissions directives.

Air quality control systems

Doosan Lentjes' air quality control systems (AQCS) are designed to remove pollutants from flue gases after the combustion process. The systems developed work with a wide range of different fuel types.

Installed in more than 150 plants around the world, Doosan Lentjes' AQCS systems reliably remove sulphur dioxide, dust and other pollutants from the power plant's flue gases. They also enable plants to comply with the most stringent environmental emissions standards by providing a sulphur removal rate of more than 99%.

Section 4:
Press releases

PRESS RELEASE

Air quality control project in Pomorzany achieves significant milestone

11 December 2017, Ratingen, Germany

The 2 x 156 MW_{th} coal-fired power plant located in Pomorzany, Poland is currently retrofitted with a flue gas desulphurisation (FGD) system which recently entered the mechanical erection phase. The turnkey project is executed by the Germany-based engineering specialist Doosan Lentjes together with its Polish consortium partner Polimex Energetyka.

René Neust, Director Project Management at Doosan Lentjes, comments: *"Our fruitful collaboration with Polimex Energetyka and local suppliers allows us to secure a reliable project execution complying with all scheduled targets. The mechanical erection phase scheduled to be completed in summer 2018 paves the way for flue gas takeover and subsequent project completion expected to be in 2019."*

Frank Oberheid, Director Air Quality Control Systems at Doosan Lentjes, adds: *"The application of "Best Available Techniques" will ensure that the plant owner and operator, PGE GiEK Zespol Elektrowni Dolna Odra, will be in line with all European emissions standards – now and in the future: With SO_2 emissions far below those expected to be legally required in the future, namely 220 mg /Nm3, the plant will be flexible in meeting stricter emissions directives to be derived from the continuous review of the BREF documents in the framework of the European IED directive."*

The project includes the turnkey construction of the FGD plant encompassing engineering, manufacture, delivery, start-up, and optimisation, as well as, commissioning. Once complete, the applied semi-dry FGD system using calcium sorbent as removal agent will absorb up to 96% of SO_2 emissions from the raw gas.

PRESS RELEASE

Doosan Lentjes to deliver a flue gas desulphurisation system for a Norwegian cement plant

12 October 2017, Ratingen, Germany

Doosan Lentjes was awarded the contract by NORCEM AS, part of HeidelbergCement, to deliver a turnkey flue gas desulphurisation (FGD) system at the Kjøpsvik cement plant, located in close proximity to the sea in northern Norway.

The Kjøpsvik facility is one of two cement plants operated by NORCEM AS in Norway – the only producer of cement across the country. Their focus is on reducing the environmental impact of their cement plants while securing a stable and uninterrupted supply of cement in order to meet the growing demand of the booming local construction industry.

With this in mind, Doosan Lentjes will apply its advanced seawater FGD process using seawater to absorb pollutants, such as, sulphur dioxide (SO_2) from the exhaust gas. Acting as the sole EPC provider will allow Doosan Lentjes to deliver an integrated solution securing an ongoing operation of the cement plant with only minimal shut-off periods for tie-in during the retrofit.

Dr. Thorsten Becker, Director Sales at Doosan Lentjes, comments: *“This current project is another proof that our advanced seawater FGD technology is flexible to meet the requirements of different types of applications: Whether installed in coal, lignite or heavy fuel oil fired power plants, or downstream of aluminium smelters – our solutions help customers around the world achieve highest desulphurisation efficiencies. Now applied at a cement plant, our technology will also secure full compliance with local emissions requirements.”*

Dr. Annette Ziemann-Nöthe, Product Manager for Seawater FGD at Doosan Lentjes, adds: *“With our advanced seawater FGD technology we will achieve SO_2 removal efficiencies of up to 95% which is equivalent to a concentration of less than 50 mg/m^3 measured on standard basis at stack.”*

PRESS RELEASE

Doosan Lentjes @ Waste-to-Energy Asia Summit 2017: Technology experts meet Indonesian waste sector

07 June 2017, Ratingen, Germany

From 07 – 09 June 2017, Doosan Lentjes discusses the potential of waste-to-energy (WtE) for Indonesia on the Waste-to-Energy Asia Summit to take place in Jakarta, Indonesia.

According to the local Environment & Forestry Ministry, the roughly 250 million Indonesian citizens produce 175,000 tons of solid waste per day which is equivalent to 64 million tons per year. From these amounts, currently, 69% are sent to non-sanitary open dumpsites which has substantially negative effects on both environment and human health due to harmful greenhouse gas emissions being released. Simultaneously, increasing levels of urbanisation and a growing Indonesian middle class will result in even higher amounts of waste generated in the future while requiring more electricity to be produced.

"This situation requires the application of advanced technologies that help to meet the Indonesian challenges of both reliable waste disposal and power shortage", says Reinhard Knittel, Sales Director at Doosan Lentjes. *"In doing so, the Indonesian government follows a proven waste hierarchy approach prioritising waste reduction, reusing and recycling. However, when recycling is not an option, the thermal waste treatment of solid waste is the final, indispensable stage of a modern and sustainable waste management concept, reducing waste volumes by more than 90 percent while recovering valuable power from the solid waste – a largely CO_2 neutral energy source. At the Waste-to-Energy Asia Summit 2017, we are pleased to discuss how state-of-the-art WtE processes tailored to individual requirements can help local clients implement sustainable waste management concepts supporting local efforts to maximise environmental protection"*, concludes Knittel.

The event in Jakarta unites professionals from across the Indonesian and beyond waste management sector and deliver valuable information about latest technological developments, local markets and players.

Section 5:

Selected case studies

Waste-to-energy, Krakow, Poland

Award date: 2012
Main fuel: Municipal solid waste, bulky and similar pre-treated waste

Doosan Lentjes delivered key technology – including the grate and boiler – for efficient and sustainable waste incineration in Krakow, Poland. The new WtE plant meets the stringent EU Industrial Emissions Directives (IED).

Circulating fluidised bed boiler, Gardanne, France

Award date: 2013
Main fuel: Biomass, waste wood, discard coal

Doosan Lentjes is providing key CFB boiler technology and a new flue gas cleaning system for the coal to biomass conversion project at Gardanne power station.
The new biomass unit will generate 170 MW_e of power while reducing the CO_2 balance by 600,000 t/a.

Flue gas desulphurisation, Rabigh, Saudi Arabia

Award date: 2010
Main fuel: Heavy fuel oil

Doosan Lentjes' seawater FGD technology is especially developed for power plants located in coastal regions, like Rabigh. A desulphurisation efficiency of 97.1% fulfils legal emissions standards. With Doosan Heavy Industries and Construction as EPC contractor and parent company of Doosan Lentjes, the customer benefits from working with one reliable single source.

Section 6:

Energy generation in 360°

Virtual Reality

Visit our homepage, www.doosanlentjes.com, open the Virtual Doosan World and take a journey through our reference plants around the world.

If you have a Google Cardboard available, open the Virtual Doosan World, click on the goggle icon, change your smartphone settings to horizontal mode, place the phone face upwards on the cardboard flap and close the lid. If you do not have a Cardboard, contact us to get your personal one.

Section 7:

Quotes

Gerhard Lohe, Director Sales and Product Line WtE

What prospective business opportunities have you discovered on the markets […] in the South Eastern Europe (SEE) region?

"Doosan Lentjes faces promising WtE business opportunities in SEE [...]. The stringent European waste disposal and emissions directives require [these countries] [..] to set up a sustainable waste management infrastructure – a valuable opportunity for Doosan Lentjes to provide reliable and environmentally-sound process solutions enabling [..] [local] customers convert residual waste into energy while complying with all applicable European standards"

Source: Energy Review Magazine, Issue 2/2016

Helmut Moshammer, Director Business Development

What opportunities do you see for Doosan Lentjes?

"I see many opportunities. All three of our product lines follow different market strengths. If we have only a few live projects on one line, the others are at a different point in the market cycle, so there is an even spread to the contracts we are managing. But we have a huge advantage in being a one-stop shop, so we can offer a wide range of solutions, from individual systems up to a complete plant."

Source: Spark Magazine, Issue 2, 2014 (published by Doosan Power Systems)

Section 8:

CSR at Doosan Lentjes

Corporate Social Responsibility (CSR)

Doosan Lentjes believes that a robust Corporate Social Responsibility (CSR) programme is not only our corporate duty, but is also critical to developing a sustainable business. The company is committed to making a positive contribution to the community, to the environment and to the wellbeing of its workforce.

CSR activities are built on three key pillars: Education, Sustainability and Community.

Education embraces a commitment to people development and to the promotion of science, technology, engineering and mathematics (STEM) subjects amongst young people. This helps to inspire people to pursue professions in engineering, helping us provide the energy solutions of tomorrow.

Sustainability efforts focus on minimising the environmental impact of the company's operations and prioritising product quality, health and safety. This is essential to the provision of a cleaner and greener environment for generations to come.

Doosan Lentjes' commitment to the local community aims to provide benefits to people in need, helping to create a better environment and quality of life for them.