
Doosan Lentjes

PRESS KIT 2018



Contents

Section 1: **About Doosan Lentjes**

Section 2: **Doosan Lentjes at a glance**

Section 3: **Power generation and Doosan Lentjes**

Section 4: **Press releases**

Section 5: **Selected case studies**

Section 6: **Energy generation in 360°**

Section 7: **Quotes**

Section 8: **Corporate Social Responsibility**

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 sustainable and conventional fuels. The company's specific areas of expertise include circulating fluidised bed boilers, key technologies for the generation of energy from waste and sewage sludge, as well as, 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 enters the grate-based waste-to-energy market

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

2018: 90th company anniversary & re-entry into the market for thermal treatment of municipal sewage sludge



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 Tel.: +49 (0) 2102/ 166 – 0
40880 Ratingen dl.info@doosan.com
Germany www.doosanlentjes.com

Board of management

Board of
Management

Thomas Stetter, Chief Executive Officer
Dirk Stokvis, Chief Financial Officer

Areas of activity

Doosan Lentjes is a specialist in the development of technologies for efficient and environmentally-friendly power generation from both sustainable and conventional fuels.

Products

Circulating fluidised bed boilers
Waste-to-energy technology
Sewage sludge treatment technologies
Air quality control systems

Media contact

Diana Baganz
Marketing Manager
Tel: +49 (0) 2102 – 166 – 1476
Fax: + 49 (0) 2102 – 166 – 2476
Mob: + 49 (0) 172 – 841 – 1476
Diana.Baganz@doosan.com



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 sustainable and conventional fuels. The product portfolio includes circulating fluidised bed (CFB) boilers, waste-to-energy (WtE) and sewage sludge treatment (SST) technologies, as well as, air quality control systems (AQCS).

Circulating fluidised bed boilers

Doosan Lentjes' circulating fluidised 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

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%.

Sewage sludge treatment technologies

Doosan Lentjes' proven sewage sludge technologies are developed to implement a safe treatment of municipal sewage sludge according to latest legal directives: Applying mono-incineration solutions allows phosphor to be recovered from the incineration ashes in a separate process step. And reliable flue gas cleaning systems help to significantly exceed the requirements of the German 17th BImSchV or European IED regulations.

In Germany and beyond, Doosan Lentjes has built more than 10 treatment plants which all secure a reliable and legally-compliant disposal of municipal sewage sludge.



Section 4:

Press releases



PRESS RELEASE

Doosan Lentjes is to deliver advanced CFB boiler technology for a new biomass power plant in Japan

05 December 2018, Ratingen, Germany

Doosan Lentjes is to deploy its circulating fluidised bed (CFB) boiler technology at a new 75 MWe biomass-fired power plant located in Sodegaura, Chiba Prefecture, Japan. The project will be executed under the terms of a larger EP contract awarded to Lentjes' parent company Doosan Heavy Industries & Construction (DHIC) headquartered in Korea.

Scheduled to be completed end of 2021, the project will support the plant owner and operator, Osaka Gas, in the economic implementation of a sustainable energy generation concept. In doing so, they will benefit from the reliability and fuel flexibility of the Doosan Lentjes' CFB boiler technology which is capable of efficiently burning climate-friendly fuel types, as, in this case, biomass wood pellets. Integrated and additionally installed emissions control equipment will further improve the environmental performance of the new power plant to meet stringent local emissions regulations.

Commenting on the project, Damian Goral, Product Director at Doosan Lentjes, says: *"For several reasons, this CFB boiler contract is an important project for us: Not only it is our newest reference on the highly regulated Japanese market, it also emphasises once again that our technology is recognised to be flexible in delivering performance beyond conventional fuel firing. Drawing back on our experience gained from previous biomass projects allows us to be aware of the certain requirements in respect of both fuel characteristics and boiler adaptations needed respectively".*

Doosan Lentjes' scope of work will encompass both engineering and procurement of the boiler island including the major boiler and key flue gas cleaning equipment. Moreover, the company's contribution is also expected to cover advisory services for both erection and commissioning along with training.

Bettina Juran, Project Manager for this contract at Doosan Lentjes, concludes: *"Together with DHIC delivering EP for boiler, water steam cycle, turbine and air quality control equipment, we will provide the main contractor, Chiyoda Corporation, with a trusted and highly efficient solution to the benefit of the final client. In doing so, our fruitful collaboration with all involved parties paired with*



our biomass expertise will allow us to execute the project within the scheduled time frame and in the required quality.”

Doosan Lentjes is a specialist in designing, supplying and commissioning flexible and high efficient circulating fluidised bed (CFB) boiler solutions, helping customers around the globe efficiently and environmentally-sound generate power from a wide range of fuel types including those with difficult combustion properties.



PRESS RELEASE

Doosan Lentjes announces re-entry into the market for the thermal treatment of municipal sewage sludge

17 October 2018, Ratingen, Germany

The German engineering specialist Doosan Lentjes will refocus on the market for the thermal treatment of municipal sewage sludge. Key driver for this decision have been new legal requirements affecting the industry. The company will concentrate on its competencies in the area of mono-incineration. By drawing back on proprietary OEM technologies, Doosan Lentjes will provide individual or full turnkey solutions based on the proven bubbling fluidised bed combustion. In doing so, it will also use own flue gas cleaning technologies that have proven their efficiency in both waste incineration and sewage sludge applications.

“Against the background of the Regulation on the Reorganization of Sewage Sludge Treatment which was released that year, we expect the demand for mono-incineration solutions to increase”, says Gerhard Lohe, Product Director Waste-to-Energy at Doosan Lentjes. “Refocusing on this business area is our response to the positive market developments we expect in Germany, but, in the future, also in Europa and beyond.”

Dr. Thorsten Becker, Director Sales at Doosan Lentjes, adds: *“Mono-incineration solutions allow implementing the, in future, legally required recovery of phosphor from the sewage sludge treatment process in both an effective and efficient way. With our technologies we aim at supporting the waste water sector to realise a reliable sewage sludge treatment according to the new legislation.”*

Doosan Lentjes has vast experience in the area of thermal treatment of municipal sewage sludge and has designed and built plants for customers from across Germany and Europe. Decreasing market volumes were the reason why Doosan Lentjes reduced its engagement in this business area some years ago. However, both the fluidised bed boiler and flue gas cleaning technologies have continuously been used for several applications.

Since 90 years, Doosan Lentjes globally delivers reliable systems for efficient and environmentally-sound energy generation from both sustainable and conventional fuels.



PRESS RELEASE

Focus on health promotion at Doosan Lentjes

26 September 2018, Ratingen, Germany

On 25 September, the German engineering specialist Doosan Lentjes carried out its first Health Day which is part of the organisational health management program. Cooperation partners were the German health insurance company TK (Techniker Krankenkasse), the Employers' Liability Insurance Association Wood & Metal, as well as, the TÜV Occupational Medical Service.

The aim of the event was to increase the employees' awareness on health related issues and to make a positive contribution to both their job satisfaction and motivation. For this purpose, health care professionals delivered lectures on different topics and offered relaxation courses. Moreover, people could receive important information on health-promoting work place designs and a healthy nutrition. Stress tests and muscle tone measurements were also part of the program that was rounded off by a fruit and vegetable buffet offered over the day.

"Our people were very interested in the Health Day", says Christine Göbel who organized the event and works in the department Quality, Health, Safety & Environment (QHSE) at Doosan Lentjes. "More than 50 of our people participated in the activities and took the chance to get impulses for both their professional and private life."

Roland Muszkiewicz, Head of the Department QHSE at Doosan Lentjes, adds: *"Employee health is a valuable asset, especially against the background of increasing workloads resulting from the complex and fast-moving modern business world. To protect this valuable asset, we have established an all-encompassing organizational health management system. This consists of a number of measures, such as, hazard assessments of psychological stress at the workplace, influenza vaccinations and eye examinations. Moreover, we subsidize workplace glasses."*



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

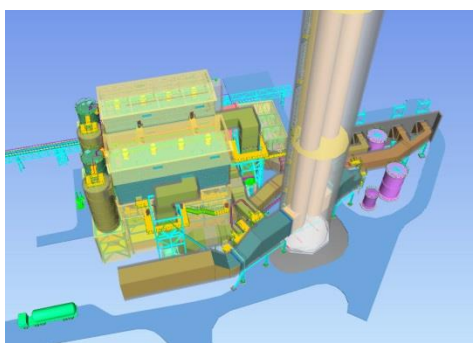


Award date: 2013

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 CO₂ balance by 600,000 t/a.

Flue gas desulphurisation, Pomorzany, Poland



Award date: 2016

Main fuel: Coal

Currently, Doosan Lentjes together with its Polish consortium partner Polimex Energetyka is delivering a turnkey flue gas desulphurisation (FGD) project at a 2 x 156 MWth power plant in Szczecin, Poland. The contract comprises the retrofit of the two existing coal-fired boilers with semi-dry Circoclean® facilities along with dry ash separation plants.

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, Product Director Waste-to-Energy



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 Moshhammer, Sales Director



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.

