

Example of a power plant in Poland

Reliable, efficient and clean power plant operation

During a ceremony on 18th October 2012, the new boiler house of the heating plant Elektrociepłownia "Zielona Góra" S.A. in Poland was officially inaugurated.

Nearly 200 guests from politics and industry followed the invitation and participated in the ceremonies.



Ten modern dreizler® marathon® LOW-NOx dual fuel burners in DUObloc-construction of the type MC 10003.5 ARZsuper and one dreizler® marathon® LOW-NOx dual fuel burner in MONObloc-construction of the type MC 10001.1 ARZsuper in conjunction with five double flame tube boilers and one steam generator of Bosch Industriekessel GmbH (LOOS KOTLY PRZEMYSŁOWE), replace old coal boilers from the year 1974 and ensure clean and low emission steam and heat generation. The new boiler/burner units will start operating from January 2013 and will supply the households in the district heating network of Zielona Góra with environmentally friendly district heating.

A total of ca. 13.4 million Euro was invested in the security of energy supply of Zielona Góra and in the improvement of environmental conditions.



Imprint

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Dates

12. – 16. March 2013
ISH 2013, Frankfurt

14. – 17. May 2013
Aquatherm 2013, Kiev

February/March/April 2013
GESTRA Symposium

Congratulation to the inauguration!

Thanks to our partners and all participants for the very good and confidential cooperation and the successful implementation of this demanding, special project.



LOOS
KOTLY PRZEMYSŁOWE

Mostostal
WROCLAW



Official inauguration ceremony on 18th October 2012 in the new boiler house



Daniel Dreizler, Joachim Morawietz (Director CENTRUM Sp.z o.o), Marian Babiuch (President Elektrociepłownia „Zielona Góra” S.A.), Aleksandra Rak (Project director Mostostal) and Ulrich Dreizler during the ceremony in Zielona Góra

Example of a power plant in Poland

Installation description of the boiler house Zielona Gora

Technical Data

Total capacity of the installation → ca. 178 MW

Burner description

10 x dual fuel burners in DUObloc construction
 marathon® MC 10003.5 ARZsuper
 Combustion capacity per burner 17 MW

1 x dual fuel burner in MONObloc construction
 marathon® MC 10001.1 ARZsuper
 Combustion capacity 8 MW

All burners in LOW-NO_x version with patented internal flue gas recirculation ARZsuper with stage combustion for especially low NO_x emissions, with speed control frequency and oxygen control oxygen

Boiler description

Loos (now Bosch Industriekessel GmbH)
 5 x Loos double flame tube boilers UT-HZ 32500x18
 High pressure hot water boiler, capacity 32 MW

1 x Loos steam boiler UL-SX 10000x10
 Highpressure hot steam boiler, capacity 9 to/h

Fuels: → natural gas, heating oil EL modulating both

LOW-NO_x combustion:

Natural gas: < 70 mg/Nm³ NO_x at 3% O₂
 Heating oil: < 150 mg/Nm³ NO_x at 3% O₂



Boiler 4
 2 x marathon® MC 10003.5 ARZsuper
 Combustion capacity 17 MW
 with Loos double flame tube boiler UT-HZ 32500x18



Boiler 2
 1 x marathon® MC 10001.1 ARZsuper
 Combustion capacity 8 MW
 with Loos steam boiler UL-SX 10000x 10

marathon®

Interview with Krzysztof Gocłowski

Technical Production Director of Elektrociepłownia „Zielona Gora” S.A.

What were the three key success factors of this project for EC Zielona Gora?

→ Krzysztof Gocłowski:

There were three very important key success factors for us: The installation of a boiler system with the best available technology at the best possible price, the strict compliance with the time frame and no accidents during the construction phase of the boiler system.

What guidelines regarding the emissions had to be complied and who checked these values?

→ Krzysztof Gocłowski:

In this project all current and future (from 2016) Polish and European Emission Regulations (Directive 2010/75/UE) had to be fulfilled.

For the NO_x emissions will then apply:
 Natural gas: < 100 mg/Nm³ at 3% O₂
 Heating oil : < 150 mg/Nm³ at 3% O₂

The emission measurements were verified and confirmed by "Energopomiar" Sp.z o.o., Gliwice, an accredited and certified Polish organisation.

What were your reasons to decide for boilers of Bosch (Loos) with marathon® burners of dreizler®?

→ Krzysztof Gocłowski:

Boilers of Bosch (Loos) combined with marathon® burners of dreizler® guarantee all technical specifications (combustion capacity, high efficiency, availability), emission values and a very attractive price.

Example of a power plant in Poland

Project steps

March 2011

Pressure testing of the boilers of Bosch Industriekessel GmbH in the factory Gunzenhausen

April 2011

Ship loading of the boiler/burner units. By cargo ship traveling from Gunzenhausen to Cigacicach on the Oder and further on the road as heavy transport for delivery and installation in the boiler house Zielona Gora.

Precision performance: Handling of the 6 boiler/burner units with a special crane through the roof of the boiler house.

June 2012

Successful commissioning by experienced and first-class specialists: The competent Team of Loos Poland and dreizler[®].



Example of a power plant in Poland

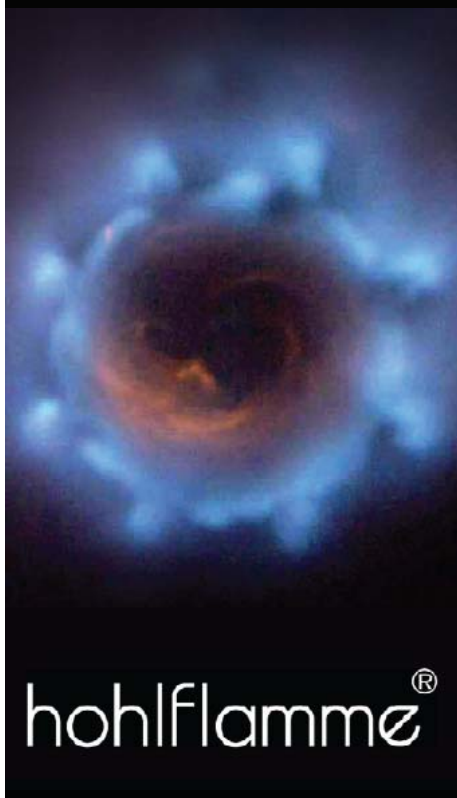
Fire and flame for exemplary emission levels

A particular focus on the implementation of this demanding project lay on the compliance with the strict emission values. Due to the perfect matching of the boiler/burner units and through the use of modern combustion technology, the required emission values were not only be complied, but even far below.

The NO_x emissions were measured over the entire load range. Each measured value was below the limit. There was no averaging and no standardisation to fuel nitrogen, air humidity or air temperature. So the basing Polish measuring criteria meet the most stringent in Europe and increase significantly the requirements of the TA-Luft, applied in Germany. Top technology for clean combustion.

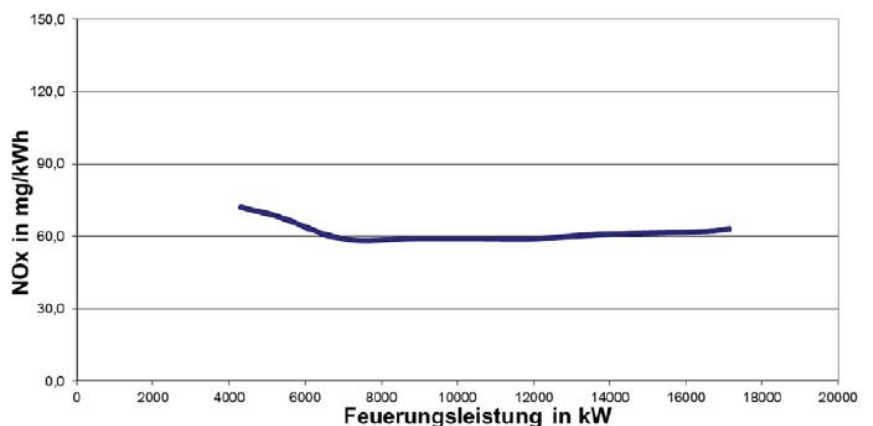


The hollow flame technology, awarded with the Innovation Award of Baden-Württemberg in 2010, is a combustion system, especially suitable for energy efficient and particularly clean heat and steam generation, using one or more gaseous or liquid fuels alternately or simultaneously operating.



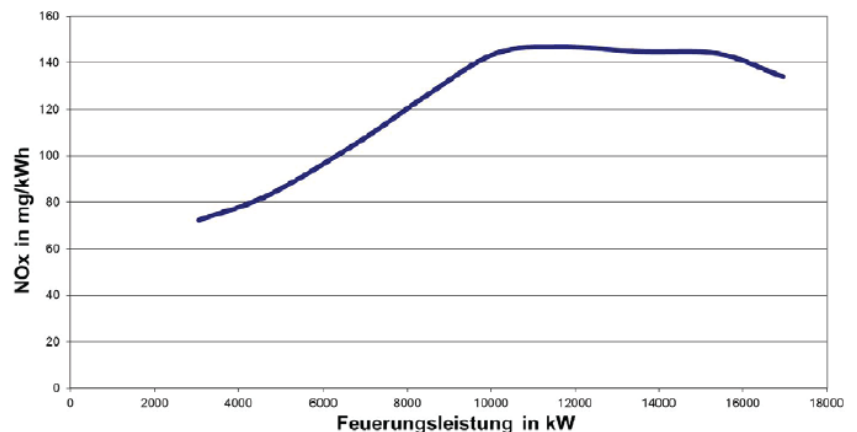
hohlflamme[®]

gas operation – NO_x mg/kWh



Graph of NO_x emissions using gas
Limit to be maintained < 100 mg/m³ at 3% O₂
Achieved < 70 mg/Nm³ at 3% O₂

oil operation – NO_x mg/kWh



Graph of NO_x emissions using oil
Limit to be maintained < 150 mg/m³ at 3% O₂
Achieved < 145 mg/Nm³ at 3% O₂

Example of an installation

Energy savings through efficient operation

High energy savings through conversion:

Due to the installation of a dreizler® gas burner **marathon® M 2001 ARZ** to an existing steam boiler Hartley & Sugden (1,7 MW) the energy costs have been reduced significantly in the factory of the Kookaburra Ltd. in Durham, Great Britain.

Moreover, the **marathon®** gas burner was equipped with the dreizler® speed control **frequency**: The variable speed of the fan is adapted to the burner capacity and ensure additionally an effective energy savings of the burner.

Tony Gilroy, Managing Director Kookaburra Ltd.: „Our cost of natural gas in relation to usage on our steam boiler has significantly reduced.....to touch and feel these savings week on week is nothing short of a great success story.“

Technical data

1 x gas burner **marathon® M 2001 ARZ** with pneumatic linkage and speed control **frequency** with a steam boiler Hartley & Sugden, 1,7 MW



Example of an installation

Successful conversion plant in the paper industry



In its own steam power plant of the paper mill Palm GmbH & Co. KG a water tube boiler was adapted from oil heating to LOW-NOx gas combustion by 2 x dreizler® **marathon® M 10003.3 ARZ**.

NO_x emissions of < 100 mg/kWh according to EN 676 should be achieved and thus well below the requirements of the 13. BImSchV.

Within a short conversion time the both modern gas burners **marathon® M 10003.3 ARZ** in DUObloc construction



were installed to a water tube boiler of Deutsche Babcock & Wilcox.

Even in the very short combustion chamber of 3,5 m of the water tube boiler, the desired NO_x emissions were clearly below <100 mg/kWh. These values are well below the regulatory values according to the 13. BImSchV (Medium temperature >210°C

≤ 0,15 g/m³ at 3% O₂).

We thank the team of Papierfabrik Palm for the successful implementation of this joint project.



Technical data

Burner:

2 x LOW-NO_x gas burners **marathon® M 10003.3 ARZ** in DUObloc construction with a common 90 kW combustion air fan

Burner capacity: → 2 x 12651 kW
With oxygen control **oxygen** and CO monitoring

Boiler:

Water tube boiler Deutsche Babcock & Wilcox

Year of construction: → 1960

Allowable steam output: → 32 t/h

Allowable operating pressure: → 67 bar

Allowable operating temperature: → 500°C

Thermal input: → 25,3 MW

News in brief

Environmental award for the Robert Bosch GmbH, Reutlingen

In Baden-Württemberg exemplary enterprises are honored by the Environmental Award, who focus on environmental performance and sustainable business. In this year first the jury price „Energieexzellenz“ was additionally awarded to that enterprise, which contributes to increasing energy efficiency and to saving energy particularly exemplary and which also generates energy from renewable sources.

The Robert Bosch GmbH with the location

Reutlingen was awarded by this award for their ecologically outstanding and particularly qualified services.

Among other things the jury explained: „The company at the location Reutlingen contributes in an exemplary manner to the conservation of resources and significantly to the reduction of CO₂ emissions by implementation of a stringent energy concept and by highly efficient systems engineering.“

We congratulate to this special award, we are grateful for the many years of close cooperation and we are proud that the marathon® burners have contributed a significant proportion of this excellent overall result for years.



Munich

TÜV seminar

On 22.-23. November 2012 the boiler operation and maintenance technology seminar of the TÜV SÜD took place with almost 150 participants in Munich. In practical and professional presentations the seminar participants were informed about current developments in the Ordinance on Industrial Safety, Standards for functional safety and prevention of damage cases. The participants intensively used the breaks to discuss concrete questions and results with the



present manufacturers of boilers, burners and components. The booth of dreizler® was well frequented and we thank for the pleasant professional conversation. A great compliment to TÜV SÜD for the once again excellent organization. We look forward to the event in 2014.

Dates

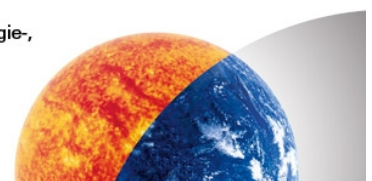
ISH 2013

ISH in Frankfurt from 12. - 16.03.2013: We exhibit and we invite you to our booth in Hall 8, C31.

Our team looks forward to your visit!

ISH Weltleitmesse
Erlebniswelt Bad, Gebäude-, Energie-,
Klimatechnik
Erneuerbare Energien

Frankfurt am Main, 12. – 16. 3. 2013



Aquatherm Kiev 2013

Aquatherm in Kiev from 14. - 17. May 2013.



Gestra Symposium 2013

„The energy center in the tension between rising energy prices and lower operating costs“.

Dates:

- 25.02.2013 Dresden
- 26.02.2013 Nörten-Hardenberg
- 27.02.2013 Hamburg
- 28.02.2013 Bremen
- 19.03.2013 Essen
- 20.03.2013 Köln
- 21.03.2013 Mainz
- 16.02.2013 stuttgart
- 17.04.2013 Augsburg
- 18.04.2013 Schweinfurt

For more information: www.gestra.de/akademie/fachtagung.php