



# DP MaxMulti Solution

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The DP MaxMulti is the most flexible and high performing biomass boiler in DP CleanTech's portfolio. Using high pressure high temperature technology originally developed in Europe, the DP Maxmulti has been further refined and patented to deliver tailored, multiple fuel biomass boilers that are the highest performing solutions available in the market.

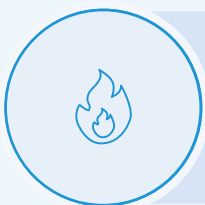
As with all DP's boiler solutions, the starting point for optimizing performance is a profound knowledge of the fuel characteristics. Such characteristics will impact the design of the feeding system; the combustion grate and the specific boiler parameters. DP's expertise in fuel analysis is a key aspect of our total

solution approach.

The modular nature of the MaxMulti allows for full integration of tailored, additional options to address the problems of poor fuel quality, and the requirement to reduce emissions. The use of advanced materials and manufacturing techniques helps to extend the plant lifetime.

The outcome of years of experience, in-depth industry knowledge and technical expertise, the DP MaxMulti is state-of-the-art, and offers the most efficient, flexible and reliable biomass solution available on the market today.

## DP MaxMulti Solution Advantages and Benefits



**Optimizes combustion of multiple fuel types through tailored engineering**



**Performance proven and guaranteed**



**Cost effectively addresses NOx emissions as an integral part of the design**



**Cost competitive**



**Is an extension of existing proven high performance product developed in Denmark**



**Extended life cycle**



**Can address multiple fuel types and quality through the design of specific components**



**Lower total cost of ownership**

# DP MaxMulti Boiler Solution

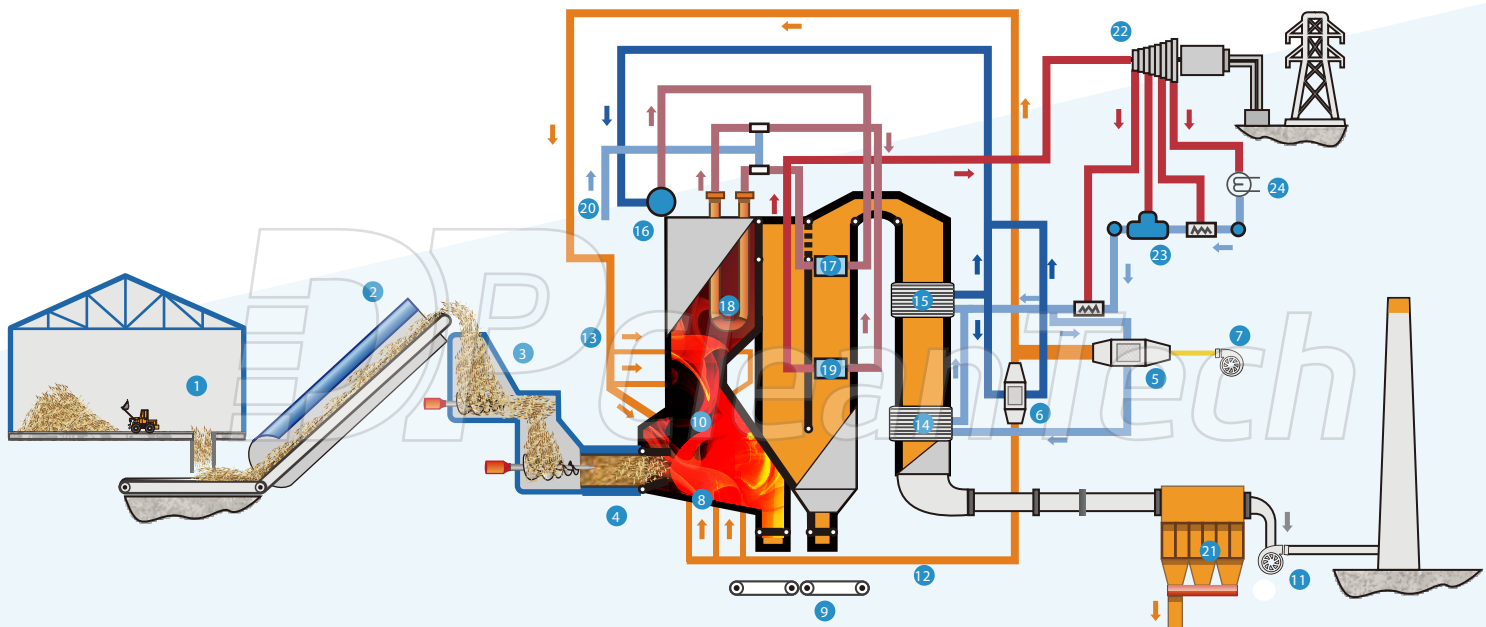


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- |                                  |                       |                        |               |
|----------------------------------|-----------------------|------------------------|---------------|
| 1 Fuel storage                   | 8 Vibrating grate     | 15 Economizer          | 21 Bag filter |
| 2 Belt conveyer                  | 9 Slag conveyor       | 16 Steam drum          | 22 Turbine    |
| 3 Dosing silo                    | 10 Combustion chamber | 17 Superheater 1       | 23 Deaerator  |
| 4 Stoker                         | 11 ID fan             | 18 Superheater 2       | 24 Condenser  |
| 5 Low temperature air preheater  | 12 Primary air        | 19 Superheater 3       |               |
| 6 High temperature air preheater | 13 Secondary air      | 20 Water for atomizers |               |
| 7 FD fan                         | 14 Flue gas cooler    |                        |               |

- Grate stock bin redesigned to handle different sized scattered fuel
- Grate modifications to improve burnout of low quality fuel, and reduce the carbon content of residue, thereby increasing boiler efficiency
- Corrosion resistant materials reduce degradation and increases product life cycle
- Modifications in air temperature and optimization of air distribution system allows fuel handling with humidity levels of up to 56.7% and LHV of 5045 KJ/Kg.

## Designed Performance Parameters (30MW power plant solution)

Main Steam Flow	Main Steam Pressure	Main Steam Temperature	Feed Water Temperature	Fuel Consumption	Boiler Efficiency	Annual Operation Hours	Plant Consumption	Plant Efficiency
130 t/h	92 bar	540°C	210°C	25 tph	> 91%	> 8000h	10%	> 33%

## Integrated NOx Reduction Technology with optional SNCR system

Boiler Size	Biomass Solution Type	Emission
130tph	Typical Biomass Solution	300mg/M3
	DP Solution	200mg/M3 (EU standard)
	DP Solution + SNCR	100mg/M3 (National China Standard)

Figures based on straw fuel standards

# How is DP CleanTech different?

## **DP is a fuel expert**

The importance of fuel in the economics of a power plant cannot be overestimated. DP designs the solution starting with a deep understanding of the fuel characteristics, to deliver solutions which are the most efficient possible.

## **DP provides integrated, fit-for-purpose solutions**

DP power plant performance is guaranteed because we consider all elements of the operation to ensure that the solution is designed to perform optimally, right from the beginning. DP can design the power plant and manage the whole process to ensure that the solutions are fully integrated and properly implemented across all aspects of the operation. DP products are designed to be fit for purpose, maintaining engineering integrity and performance whilst minimizing surplus design and manufacturing.

## **DP understands the economics of biomass power plants**

Unlike many providers, DP has great experience in power plant economics, and is dedicated to working with clients to achieve cost competitive solutions which provide the long term value and economic viability needed to achieve financial and business objectives.

## **DP invests in the future**

DP conducts ongoing R&D to ensure that its solutions are proactively addressing the changing needs of our customers, and that they remain the most efficient, performance guaranteed solutions in the market.

# Research & Development

The DP MaxMulti is based on the proven design of the 130tph (1\*30MW) biomass boiler solution. This advanced biomass direct combustion technology was developed in Europe and has been further refined and used successfully in more than 40 power plants in China.

DP has many years of operating experience and extensive operational data. This data, together with fuel data from DP's proprietary Biomasslab are major inputs to our ongoing research and development. Improving the performance of our products for an ever increasing range of fuel types is essential, and the simultaneous combustion of multiple and varied fuel types is an ongoing challenge to boiler performance capabilities.

DP's Global Engineering Services experts have tested and optimised the technology for reliability and performance, and all our products are designed for easy integration and installation. Modifications and improvements meet all relevant international standards of quality and reliability, and are developed and performance proved before being incorporated in projects. DP also has the expertise - through our Flue Gas Cleaning division based in the UK - to provide solutions that reduce NOx emissions to regulatory standards.

In addition to engineering expertise, DP is able to offer advice on the most efficient and effective methods for feedstock input, thereby ensuring that all parts of the biomass-to-power process are fully optimized.



# About DP CleanTech

- ✓ DP CleanTech designs, engineers, manufactures and commissions biomass and waste-to-energy power plants, providing complete solutions for turning waste materials into clean energy.
- ✓ DP CleanTech has over 70 biomass power plant references around the world using high pressure, high temperature technology originally developed in Denmark.
- ✓ DP CleanTech built the first biomass power plant in China and is responsible for over 30% of the biomass power plants operating in China today.
- ✓ DP CleanTech is recognized as a world leader in the biomass clean energy field.

## MATERIALS

The quality of materials and manufacturing are guaranteed to meet prevailing international standards. By utilizing proven corrosion resistant materials and technology, we significantly extend the product lifecycle thereby enhancing the cost effectiveness of all our boiler products.



## MANUFACTURING

DP has its own manufacturing facility in Europe as well as a longstanding and trusted global supply chain. Designs are tailored according to customer needs and are built using modular components, allowing greater flexibility to manage costs.

