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Biomass

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environment-friendly and economical combustible with future

You can gain the following heating output out of biomass:

- **2,5 kg of wood waste** (dry)
- **2,0 kg of pellets** (output nearly 4,9 kwh/kg)
- **3,5 kg of wood chips** (humidity nearly 40 %)

→ **Corresponds to 1 litre of oil / 1 m³ of natural gas**

Additionally, the combustion of wood/biomass conserves the **balance** of **CO2**, that means that the natural equilibrium is respected.

The reduction of the greenhouse gas carbon dioxide is approx. 160 tons per 500 kW
(in approx. 1600 h within a heating period)

Types of fuels

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Fuel / Furnace types

	Underfeed furnace	Moving grate furnace
Type of fuel	Homogenous	Inhomogenous
		Difficult fuels
	Pellets	Unusual mixtures
		Small content of dust
Moisture content	Max.l 35%	35% to 50%
		< 35% for difficult and coarse-grained fuel
		> 40% only with a small amount of fines. Ignition and partial load critical.
Grain size	max. G30	max. G50 with screw feeder
		> G50 hydraulic insertion
Content of ash	Max. 2%	>2%
		Ash with low melting point

Underfeed furnace technology

The underfeed furnace is a static furnace technology. The fuel will be moved only by fuel insertion while the new fuel will push the existing fuel and ash inside the combustion chamber.

The underfeed furnace is a simple, robust furnace for all types of fuel if they don´t clinker are not wet or not coarse-grained. It has the following advantages:

- Slow insertion of the fuel i.e. calm firebed.
- Low-maintenance, short heating-up time, few residual heat, easy ash removal.
- Economy-priced.

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Qualität
Zuverlässigkeit
Sicherheit

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Underfeed furnace with ash removal screw

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Type LCS-RU

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- even more efficient
- even more comfortable
- even more environment-friendly

Automatic grate firing for wood shavings, chopped shavings, briquettes, wood chips and pellets
Boiler output: 70 – 1050 kW

Firing installation: Pellets in a marketgarden

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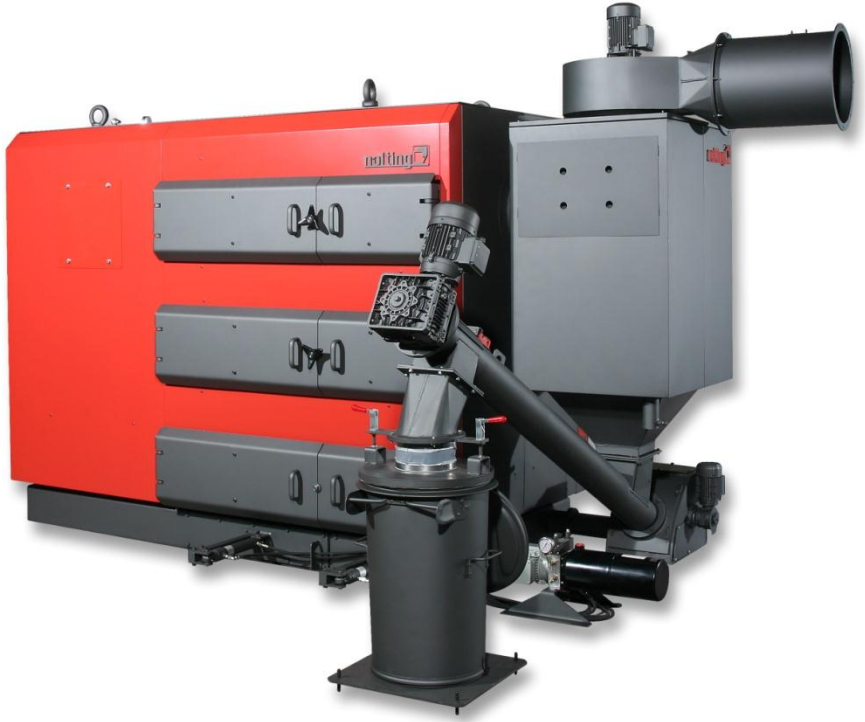
Automatic underfeed grate firing plant type LCS-RU 400/450

Boiler output: 450 kW

Fuel: Pellets according to DINplus/ EN-Norm Klasse A1

with
- **automatic ignition**
- **automatic regulation fitment „VALA“**
- **de-ashing of combustion chamber**
- **heat exchanger**

Type NRF



Underfeed firing plant for shavings, wood chips and shaving briquettes
Boiler output: 250 - 1250 kW

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Firing installation: Pellets in a nursing home

Pellet depot with v-shaped funnel (under floor) constructed by **nolting**

The integrated dust separator (heat insulated) equipped with suction fan and ash container that can easily be changed

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Moving grate furnace technology

The moving grate furnace technology is a dynamic furnace. The insertion unit transports the fuel on the moving grate. The whole grate looks like a stair in which every second step is moved.

Rhythm and velocity of the grate is controllable. So the furnace can be adjusted to the varying fuel types.

The moving grate furnace technology is for several fuel types more suitable than the underfeed furnace technology. It is suitable especially for fuel with a high content of ash, with high content of moisture or coarse-graind fuel types. Also it is suitable for fuel with lo ash melting point.

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Moving grate furnace technology

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Type LCS-RV

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- even more efficient
- even more comfortable
- even more environment-friendly

Automatic grate firing for wood shavings, chopped shavings, briquettes, humid/wet wood chips and pellets
Boiler output: 70 – 1050 kW

Firing plant: wood working and processing

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Automatic forward feed grate firing type LCS-RV 400/450 for wood residues from wood working and processing (Shavings, flake board) and forest chips G30

Pushing floor change container for wood chips

Boiler output: 450 kW

- **Fuels are conveyed of change container and/or silo**
- **Both fuels meet halfway, and on that point the material is conveyed by a common trough conveyor screw to the boiler insertion screw**

Type VRF

Forward feed grate firing plant
for biomass (e.g. pellets, shavings, wood chips etc.)
Boiler output: 350 – 3000 kW

Firing installation: wood chips in market garden

Installation of forward feed grate firing type VRF 2700
Fuel: wood chips according to ÖNorm M7132 and M7133

Feeding by scraper chain conveyor

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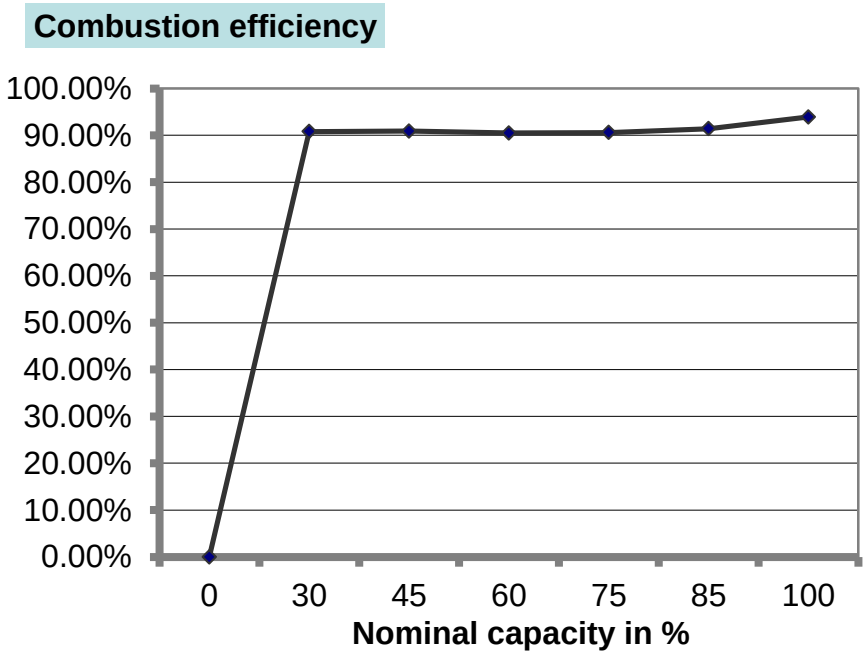
Efficiency

A substantial proportion of the benefit has of course the boiler. Here takes place the essential amount of the heat transfer from the flue gas to the boiler water. For this to happen successfully, each boiler is optimized in terms of flue gas quantity and moisture content.

The optimization of combustion chamber and heat exchanger is a key factor to achieve high efficiency.

Efficiency



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Efficiency

By radiation losses of the boiler efficiency is slightly reduced.

The radiation losses are between 3.5 to 1.8% of the value of the nominal capacity of the boiler.

The larger values for small boilers and the smaller values for larger boilers thereby apply.

This is understandable, because larger boilers have a better capacity / surface ratio.

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For more information please contact:

www.nolting-online.de

www.nerc.co.jp/wp/nolting/