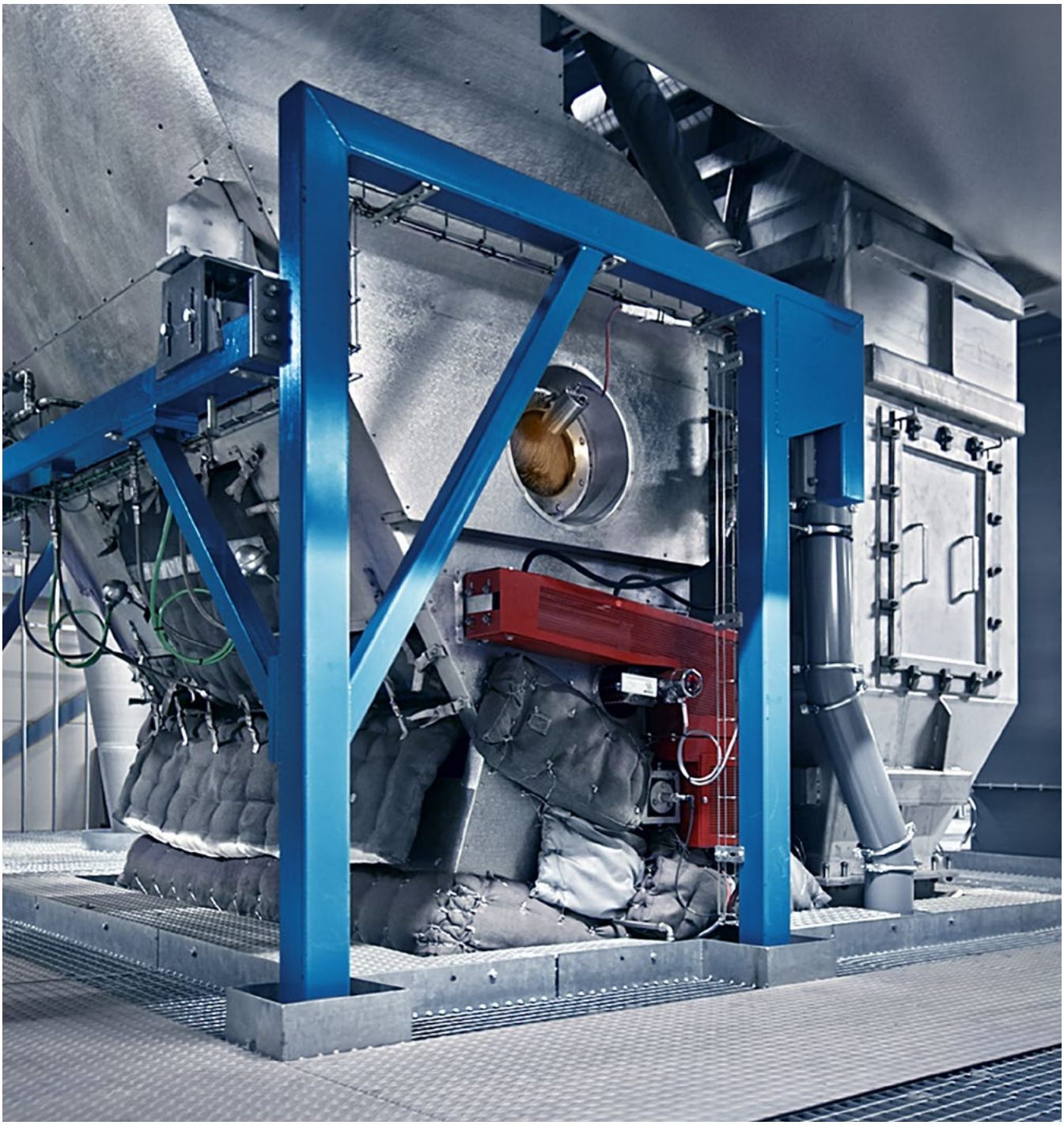
NEUHAUS NEOTEC

Coffee is our life.®

RFB ROASTING SYSTEMS

FOOD INDUSTRY



neuhaus-neotec.com

NEUHAUS NEOTEC AT YOUR SIDE

With expertise in innovative roasting technologies

NEUHAUS NEOTEC's company history dates back more than 90 years and the company has been developing machines and system components for coffee processing for more than 50 years. Whether roasting, grinding or the entire handling process, we are constantly working on new solutions to optimise the processes for our customers. Our aim is to get the best out of the bean in every step of the process.

Today NEUHAUS NEOTEC is one of the world's most established and leading suppliers of production equipment for coffee processing. Apart from the roaster and grinder as core components, the product portfolio covers the entire process chain from green coffee reception to the preparation of the roasted coffee for packaging. Modern plant control systems ensure a smooth production process as well as the monitoring of the individual process steps.

Almost all well-known coffee producers are among our loyal customers. Roasting and grinding plants from Ganderkesee are in operation on every continent for the production of the entire range of coffee specialities. Coffees refined with our roasting machines have already won various awards.

We see ourselves as your partner for everything to do with coffee processing and are happy to advise and support you with your process design.

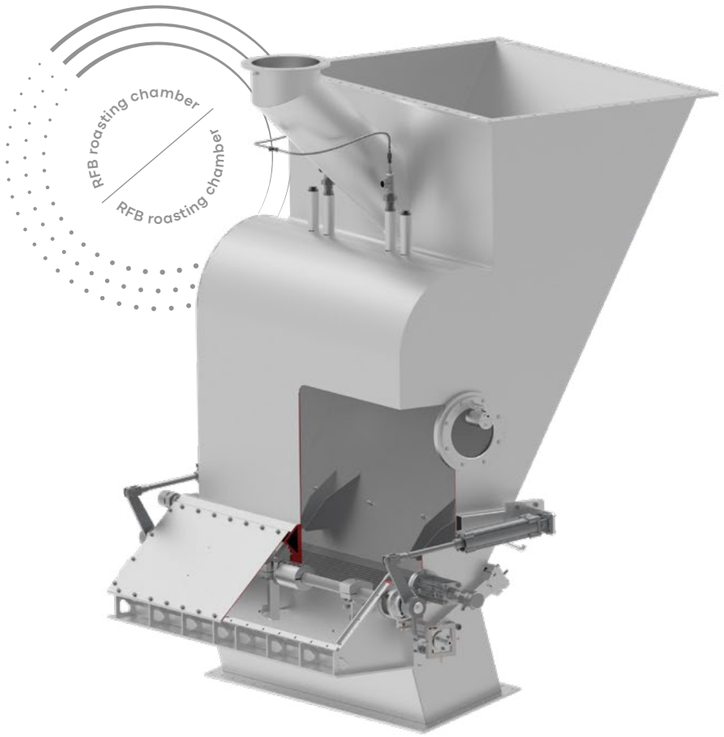
More than 50 years of success in the development of coffee processing plants

NEUHAUS
NEOTEC

CONTENTS

RFB ROASTING TECHNOLOGY

Highest standards in terms of reliability, flexibility and energy efficiency



The RFB roasting technology provides a unique roasting solution and like no other technology, it ensures efficient and flexible coffee roasting by means of convective heat transfer. Due to the short response time of the roaster to parameter changes in the recipe, RFB roasting systems enable a significantly wider range of roasting recipes to be processed compared to conventional roasting methods. The optimum heat transfer through convection also means significantly shorter roasting times without any loss of flavour. The colour consistency both within and across batches is second to none.

Nowadays, RFB roasters are used worldwide for all conceivable coffee specialities, for filter coffees and speciality roasts as well as for traditional Italian roasts or pre-products for processes downstream of extraction. Leading global companies are among our loyal customers, as are small speciality roasters catering to the needs of local markets.

Advantages

- All capacities covered (from 15 – 4000 kg / h) due to the wide spectrum of the RFB roaster series
- Unparalleled possibilities for creating traditional and exceptional roasting profiles
- Direct measurement of product temperature in the coffee layer
- Rapid temperature adjustment to changes in set parameters
- Use of water (quenching) only in the cooling chamber
- Low energy consumption due to maximum energy yield
- No moving parts in the process chambers
- Unmatched reproducibility of each roasting batch

The core component and the “heart” of every RFB roaster is the roasting chamber with its unique geometry. It has been designed precisely to meet the requirements of the roasting process and it guarantees uniform roasting of the entire batch. Both bean movement and roasting are regulated by the controlled hot air flow. As a result, mechanical built-in components such as agitators and paddles, which might damage the sensitive bean, are not required.

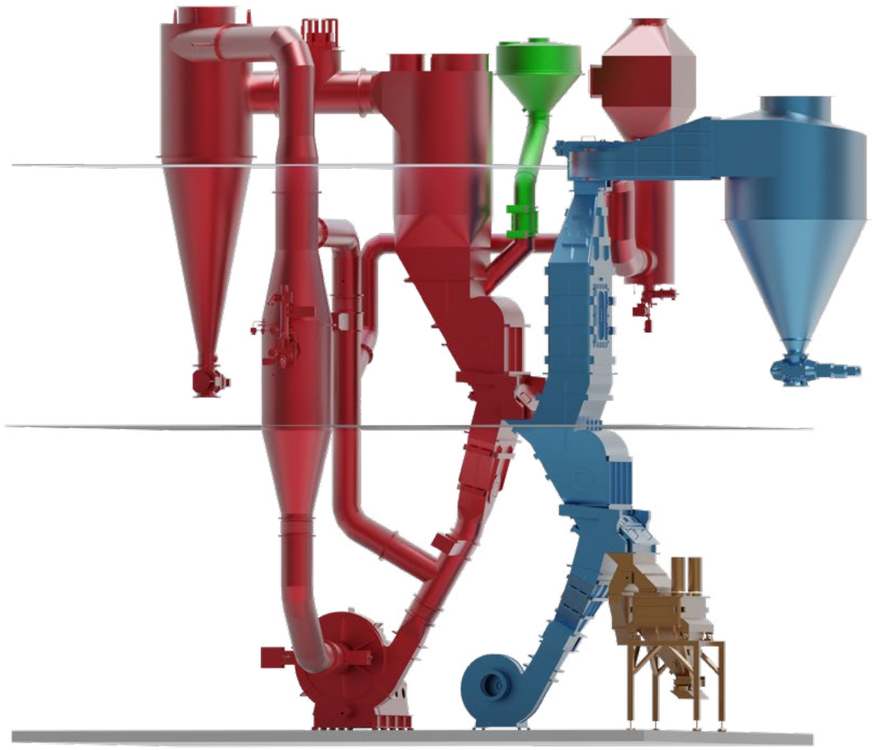
As the temperature sensor is completely covered with coffee, the result of the product temperature measurement is accurate throughout the entire roasting process. Thus, it can be controlled with pinpoint accuracy so that colour, roasting degree and aroma are identical within the batch and throughout all roasting batches of the production cycle. The intelligent damper control system controls the air quantity and speed in the roasting chamber, so that traditional roasting profiles with longer roasting times as well as shorter roasts with high heat input can be obtained.

Filling and emptying the chambers via gravity constitutes another special feature of the RFB roasting technology. This method reduces the discharge time to a few seconds, prevents unwanted post-roasting even with large batches and the entire quenching process can be transferred to the cooling chamber. Due to a bypass function during the filling and emptying process and the transfer of the quenching process to the cooling chamber, energy and time-consuming reheating processes in the roasting chamber are no longer necessary.

The fan with high power density recirculates the roasting gas in the hot gas circuit; and the burner with a wide modulation range adapts ideally to the acute energy demand. This unique combination of process control and technical design makes the RFB roasters the most energy-efficient roasting systems in their capacity class. The intelligent roaster control system simultaneously manages up to three batches in the roasting plant, i.e. one in the green coffee supply section, one in the roasting section and one in the cooling section of the roasted coffee. Therefore, RFB roasters achieve high capacity rates even with small roasting chambers. A large variety of software options allows the control system to be tailored precisely to your individual product requirements.

ROASTER SERIES RFB

Large roasting capacities with reproducible results



Innovative coffee roasting with a unique roasting profile range

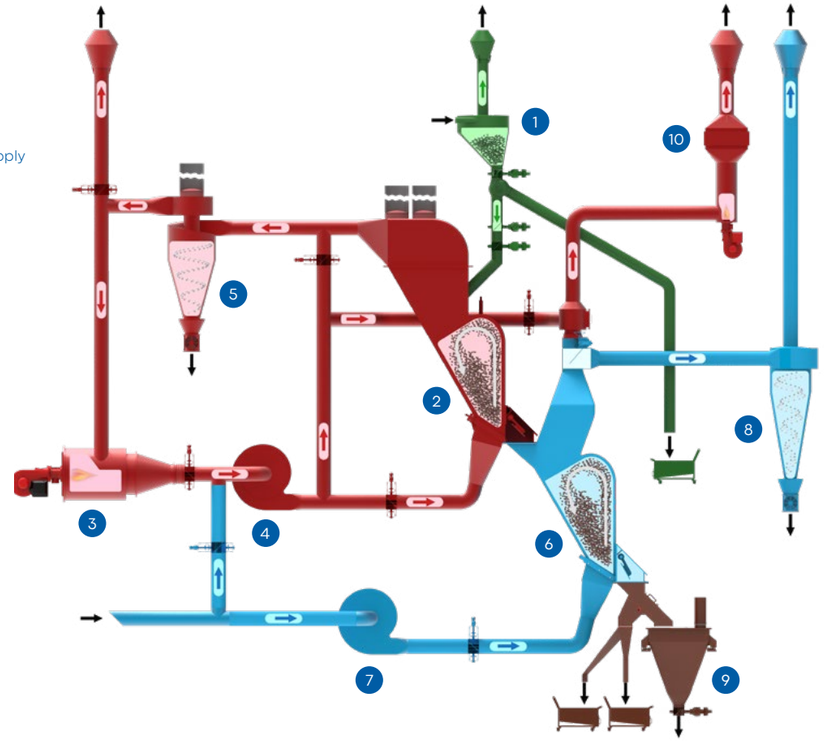
You want to get the best out of every bean? Here, we have set new standards with the development of our RFB roaster. No matter whether it is more aroma, flexibility, consistency, ease of operation, high availability or low energy consumption you are after – the RFB roaster series meets all criteria.

A broad selection of batch sizes as well as adjustable roasting air quantities and temperatures enable you to create roasting profiles completely according to your demands.

Maximum process control throughout the entire roasting process

The coffee aroma is not only defined by the roasting degree and the roasting time, but also by the intensity of the heat introduction into the bean. With the profile roasting of the RFB series, you are able to control the roasting profile precisely throughout up to 21 profile steps (temperature / air volume / time). Due to the low heat retention of the RFB roasting chamber, the system reacts quickly to the profile specifications and offers a maximum variety of profiles.

1. Green coffee bin
2. Roasting chamber
3. Hot air generator
4. Main fan for roasting air
5. Hot air cyclone
6. Cooling chamber with water supply
7. Main fan for cooling air
8. Cooling air cyclone
9. Roasted coffee bin
10. Exhaust air cleaning



Technical features

- Low energy requirement due to closed roasting gas circuit
- Durable and low-maintenance chambers due to low thermal cycling
- Highest availability due to short heating times and low maintenance requirements
- Safe process control through redundant temperature monitoring and a large variety of safety sensors
- Burner with very wide modulation range
- Flexible loading of the roasting chamber (30 – 110 %)
- Short roasting times of ≥ 1.5 minutes possible

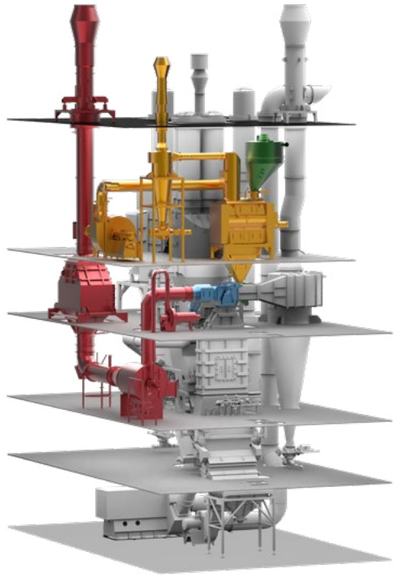
Options

- Preheating device for increase of roasting capacities
- Various exhaust air cleaning systems to meet local emission regulations
- A variety of additional equipment for safe roasting of very dark coffees in a monitored atmosphere and for creating exceptional roasting profiles

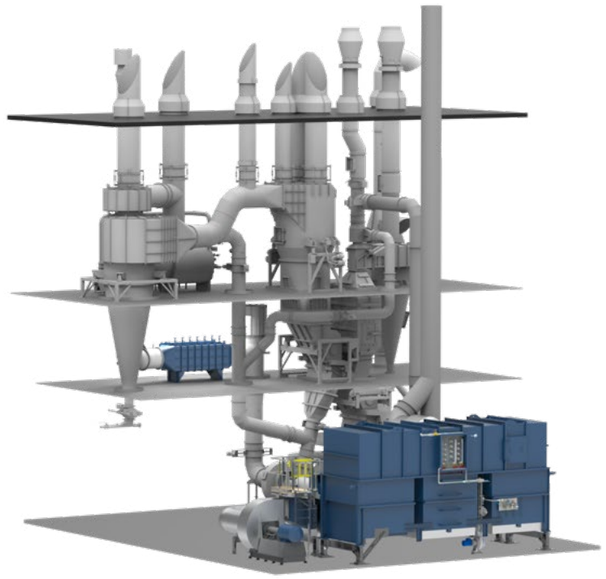
Type	Batch size (kg)	Nominal capacity approx. (kg / h)
RFB 200	60 – 240	2000
RFB 250	80 – 290	2500
RFB 300	90 – 340	3000
RFB 350	100 – 395	3500
RFB 400	110 – 450	4000

SUSTAINABLE ENERGY MANAGEMENT

Innovative systems for energy generation and exhaust gas treatment



↑ RFB with preheating and catalytic post-combustion



↑ RFB-E with electric heating register and RTO exhaust gas treatment

The unique process control of the RFB roasting system by itself ensures a high utilisation of the generated heat and a lower energy consumption compared to other roasting systems. NEUHAUS NEOTEC offers even more possibilities to increase the efficiency of roasting systems. Preheating the green coffee, for example, increases the roasting capacity with the same plant capacity and also reduces energy consumption in the double-digit range. Here, the exhaust heat from the roasting air circuit is used to pre-dry the green coffee. This preconditioning shortens the subsequent roasting process in the roasting chamber so that the output per hour of the roasting plant can be increased by 15 – 20 %.

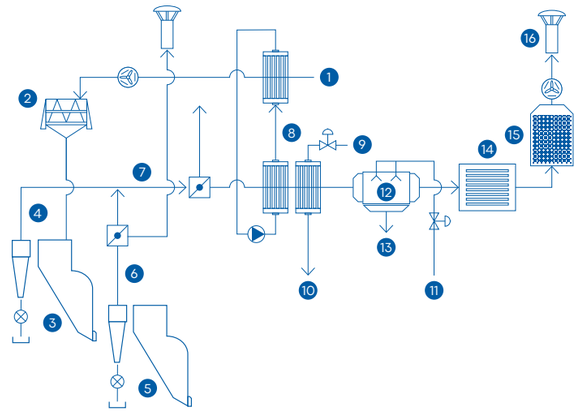
However, the exhaust air heat can also be used for other downstream processes within the production infrastructure or externally for the provision of district heat. The possibilities are assessed on the basis of the daily operating time and the power rating of the roasting plant in order to determine specific economically viable solutions.

Exhaust gas treatment in large roasting machines is now an integral part of a production facility. NEUHAUS NEOTEC, together with its specialised partners, continuously develop innovative solutions to ensure clean exhaust air with the lowest possible energy input. There are various

technical solutions which take into account both ecological and economic considerations. Together with you, we reconcile local emission regulations, your business goals and investment potential in order to offer you a customised solution.

At NEUHAUS NEOTEC, we offer all kinds of exhaust gas treatment systems that are suitable for the respective roasting plants. They include the thermal decomposition of hydrocarbon compounds, catalytic exhaust gas cleaning with low-NOx catalyst inserts and regenerative thermal oxidation with minimum energy consumption in continuous operation.

NEUHAUS NEOTEC, as an innovation driver in the industry, pursues completely new approaches to exhaust gas treatment with its partners until they are ready for the market. For example, NEUHAUS NEOTEC uses the effects of UV-C radiation to initiate chemical degradation reactions. Photo-oxidation effectively breaks down volatile hydrocarbons as well as odorous substances typical of coffee into innocuous water and CO_2. Since photo-oxidation is a cold process, the heat contained in the exhaust gas of the roasting process can be extracted via heat exchangers and used productively for other processes.



1 Fresh air
2 Green coffee preheating
3 Roaster
4 Raw gas roaster
5 Cooler
6 Raw gas cooler
7 Mixed gas
8 Heat exchanger
9 Cold water
10 Hot water
11 Water
12 Scrubber
13 Waste water
14 UV-C unit
15 Activated carbon reactor
16 Clean air

↑ Schematic representation of the UV-C exhaust gas cleaning system

ROASTER SERIES RG

The special roaster for medium capacities

Developed on the basis of the successful RFB series, the RG has been specially designed for the smaller capacity range from 300 to 1500 kg/h. Due to its compact design it can also be installed in confined spaces. The RG is easy to operate via the on-site panel and highly reliable. With the flexible RFB roasting technology, the complete range of roasting profiles can be created – from gentle long-time roasting to short-time roasting for processes downstream of extraction. The precise temperature measurement and precise control of the roasting parameters provide a reliable reproducibility of the roasting result. The preheated air flowing directly through the product ensures particularly gentle roasting. The simple adjustment of the air quantity and temperature results in a unique variability of the coffee roasting process.

The fluidised bed cooler is characterised by its low overall height and high cooling capacity. If required, water can be added via a quenching device.

RG roasters are delivered with the roasting and cooling chamber already pre-assembled in the main frame and can thus be quickly set up and started up on site. The low height ensures easy access to all components for maintenance.

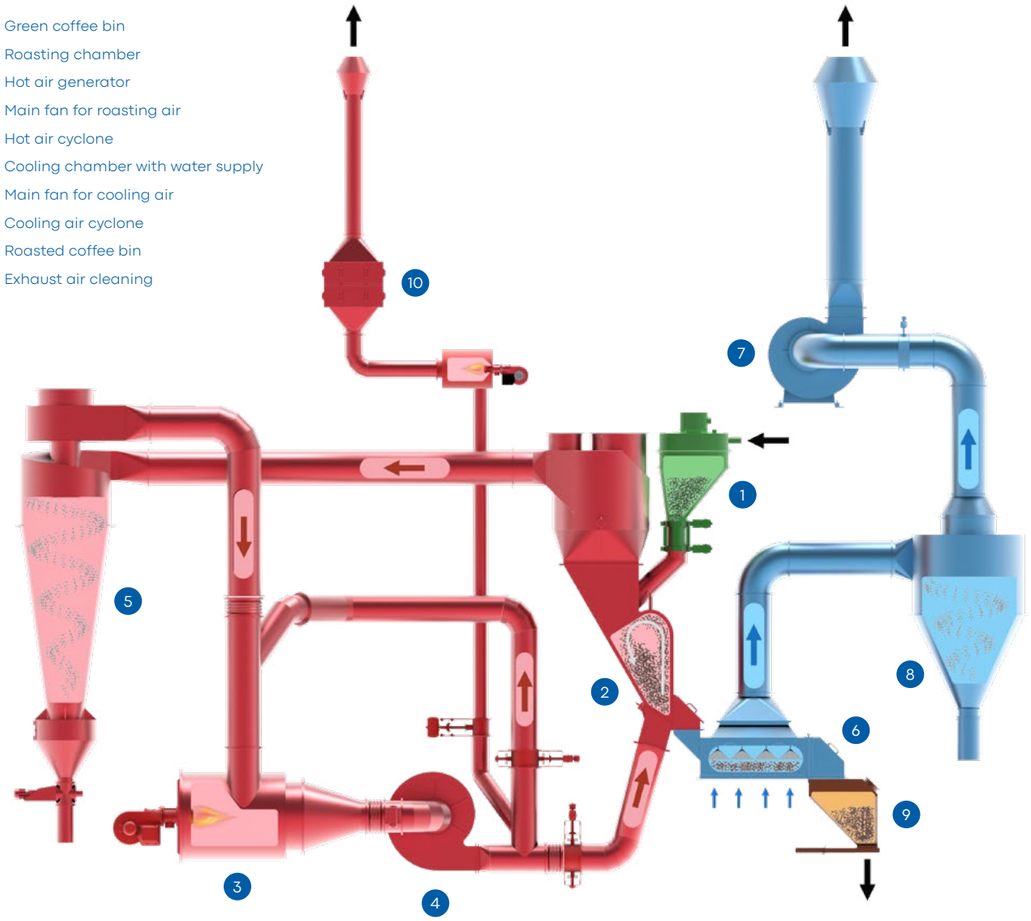
The compact design allows installation even in confined spaces

Technical features

- → RFB roasting chamber in combination with a flat-bed cooling system
- → On-site panel for recipe management and roaster control
- → Easy operation due to automated process control
- → Fully flexible setting of roasting curves due to profile roasting
- → Low maintenance requirements and easy accessibility
- → Rapid availability due to very short heating times

Type	Batch size (kg)	Nominal capacity approx. (kg/h)
RG 30	10 – 35	300
RG 60	20 – 65	600
RG 100	35 – 110	1000
RG 150	50 – 165	1500

1. Green coffee bin
2. Roasting chamber
3. Hot air generator
4. Main fan for roasting air
5. Hot air cyclone
6. Cooling chamber with water supply
7. Main fan for cooling air
8. Cooling air cyclone
9. Roasted coffee bin
10. Exhaust air cleaning



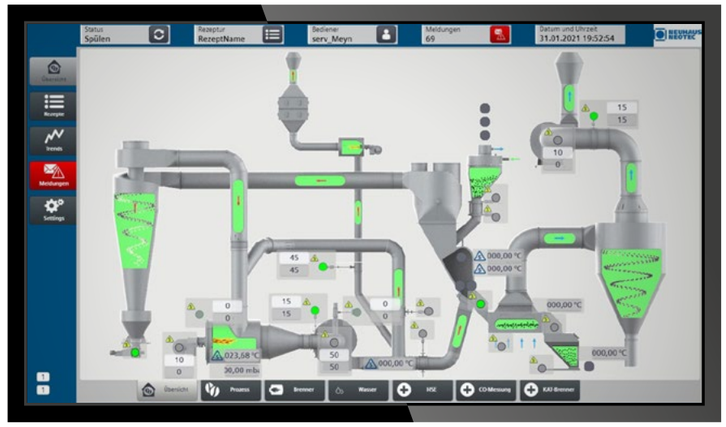
ROASTER CONTROL SYSTEM

Total control – total flexibility – total security

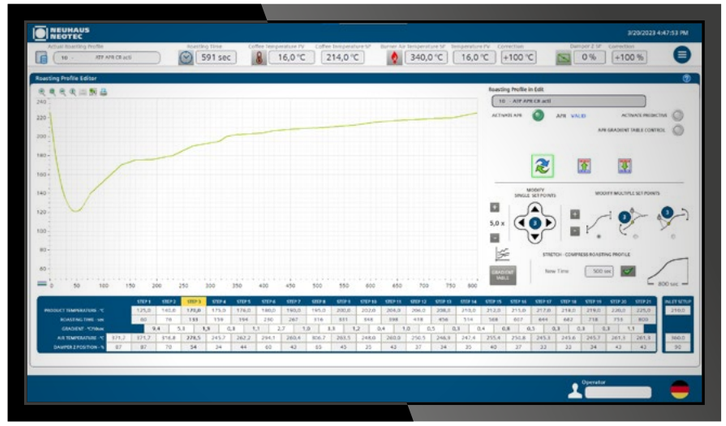
All RFB roasters are equipped with a powerful PLC, regardless of their size and roasting capacity. It goes without saying that recipe management and automatic roaster control are part of the basic equipment. All relevant data of the roasting process are recorded and presented clearly to the operator. In addition, there is a wide range of features available, tailored to your individual needs and the requirements of different process demands. The combination of our intelligent software with the process-oriented design of the RFB roasting plants allows the roasting curves to be precisely designed on the computer and then executed by the roaster. The roaster's very short reaction time resulting from minimum inertia allows direct recipe adjustments even during the operation.

A large number of sensors monitor the roasting process so that the control system can give an early warning in critical process situations or intervene independently in the roasting process. Using the patented DARK ROAST function for regulating the roasting gas atmosphere, the darkest roasts can be produced safely with controlled CO management.

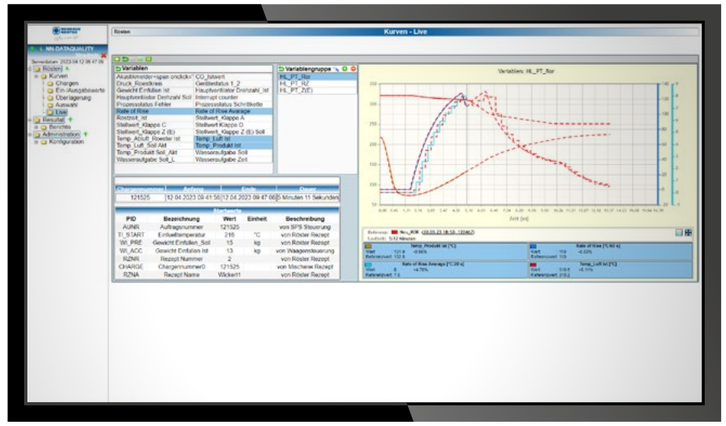
The operation of the roaster is adapted to the operating conditions of the machines. We offer you different options depending on your requirements, be it a separate control room, a local touch panel or flexible operation via a tablet.



↑ Intuitive roaster operation via the visualisation



↑ Direct roasting curve specification with PROFILE DESIGNER



↑ Complex roasting curve analysis with NN-DATA

There are different ways of specifying roasting curves for the roasting system. NEUHAUS NEOTEC offers a wide range of software tools for designing the roasting curve specification. Both time-controlled roasting and profile roasting through up to 21 steps are possible. Via the COPY ROAST function, the roaster control system continuously compares the actual value of a roast with a specified reference curve and automatically adjusts the roasting parameters accordingly. The PROFILE DESIGNER enables the operator to design a complete roasting curve within the physical limits, which the roaster then executes automatically.

Using the patented TRIPLE-A© function, it is possible to influence certain chemical transformation processes, such as the undesired formation of acrylamide in coffee, by means of extremely high thermal energy inputs and rapid heat dissipation from the roasting system. In addition, TRIPLE-A provides a wider range of options for creating roasting profiles. For high-quality coffees, for example, they can be adapted even more individually to the ideal aroma development.

Data analysis systems such as NN-DATA enable batch tracing and the analysis of different roasting curves including all relevant roasting parameters.

ROASTER SERIES NEOROAST

The highlight in every boutique roastery

The NEOROAST series is the result of combining state-of-the-art roasting technology with traditional design elements. The RFB roasting technology ensures maximum flexibility in the design of roasting profiles. The particularly wide design range allows for traditional long roasts as well as roasting profiles with shorter times, high energy inputs or extravagant RoR* curves.

*Rate of Rise

Flexible production design due to a large range of batches

There are no mechanical components that damage the bean surface during roasting. Instead, the beans are moved solely by a hot air flow. The special shape of the roasting chamber guarantees gentle and even roasting of the entire batch while optimally mixing the product. The transfer of heat energy via the air flow ensures a uniform drying and roasting process in each individual bean. Typical problems that occur in conventional roasting, such as hotspots and different roasting results in the batch, are definitely a thing of the past. The high precision in temperature measurement and control guarantees reproducible roasting results and many options for checking the roasting results.

Thanks to the large filling range of the roasting chamber from 30 – 110 % of the nominal batch size, you may also roast smaller quantities of seasonal coffees in addition to your main products.

The traditional round cooler with its slowly rotating agitator is a striking element that should not be missing in any show roastery. The customers can examine the roasting result immediately while enjoying the aromatic scent of the beans. The cooling is enhanced by a powerful fan under the round screen in low pressure operation.

Technical features

- Roaster operation via touch panel or tablet
- Automatic feeding and roasting chamber discharge
- Compact design
- Recirculation of the hot air (NEOROAST 60)

Options

- Autonomous recipe management with NN-PROFILE and data interface to external analysis tools (CROPSTER, ARTISAN)
- Recirculation of the hot air (NEOROAST 30)
- Catalytic exhaust air cleaning (partner REICAT)

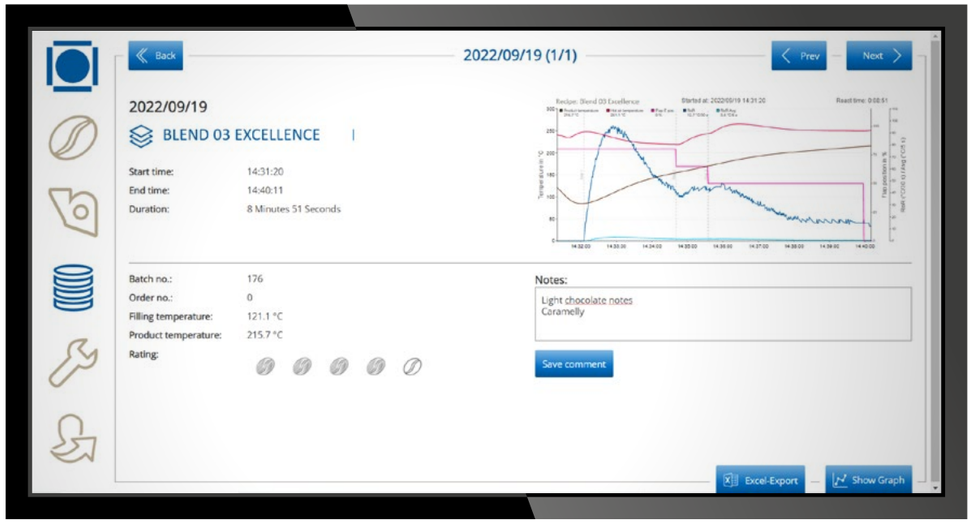
Type	Batch size (kg)	Nominal capacity approx. (kg/h)
NEOROAST 15	5 – 17	≤ 120
NEOROAST 30	10 – 33	≤ 240
NEOROAST 60	20 – 60	≤ 480

↑ Roasted coffee in the cooler

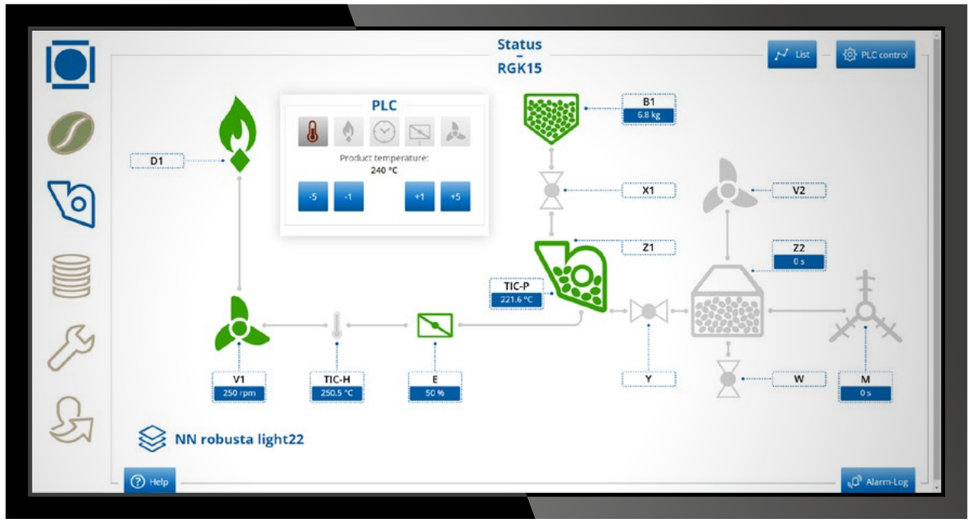
The NEOROAST can be controlled according to your individual needs via the touch panel on the control cabinet, via an external PC with a large monitor and via tablet.

The roaster's icon-based control system is intuitive and easy to understand. Due to colour changes of the icons when the machine component is active, the operator rapidly becomes aware of the operating status.

For advanced roasting curve management, NEUHAUS NEOTEC offers the comprehensive NN PROFILE software package with a powerful industrial PC in the control cabinet. The software is used both for operating the roaster and for recipe management and roasting curve validation. All roasting parameters such as hot air and product temperature, RoR curve and damper positions are recorded and are available for the operator for further optimisation of the roasting curve. Sensory analyses of the roasting process can then be recorded in the roasting log so that the results can be retrieved later.



↑ NN-PROFILE software for roaster control and recipe management



↑ Clear visualisation of the roasting parameters

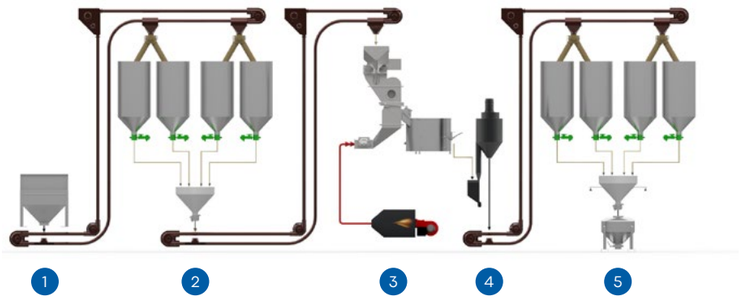
COMPLETE BOUTIQUE ROASTERIES

According to your individual design ideas

With our longstanding experience in the construction of complete plants, we offer you the design and delivery of complete roasteries, individually tailored to your needs. Our design concepts offer the charm of artisan manufacturing and at the same time a high degree of automation in handling of the coffee beans. Thus, an economical production is ensured even with smaller capacities.

Different versions of our plant control system for coffee weighing, storage, blending and transport enable both manual and fully automated process control. We configure production processes that allow you to focus fully on the development of your roasting recipes in order to offer your customers the best coffee experience.

Flexible adaptation of the plant design to your needs



1. Bag reception with green coffee weighing
2. Green coffee silo with dosing scale
3. Roaster
4. Destoner
5. Silo for roasted coffee with dosing scale

SMALL ROASTERS

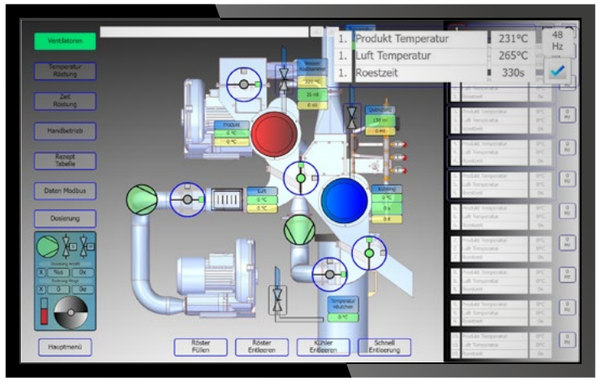
Maximum performance also in small roasters

RFB JUNIOR

Without moving mechanically driven devices in the roasting chamber, the product is roasted only through contact with heated air. The unique shape of the roasting chamber guarantees gentle and uniform roasting throughout the batch, with optimum mixing of the product. In the identically designed cooling chamber, air is drawn in from the outside to quickly cool the product, using the same circulating principle. Developed as a flexible roaster for R & D, the RFB JUNIOR is also ideally suited for small-quantity roasting in shops and small roasteries because of its compact design, its ease of operation via a large touch panel and its automatic processes.

Technical data

- Batch size: 2 – 5 kg
- Roasting times: ⩾ 1.5 min
- Heating source: electric
- Standard voltage: 3 × 400 V, 50 – 60 Hz
- Connected load: 60 kW
- Dimensions (L × B × H): 1385 × 1132 × 2002 mm
- Weight: approx. 630 kg
- Exhaust air connection: Ø 200 mm



The visualisation of the roaster control system represents all mechanic components of the roaster with all relevant manipulated variables. The dynamic colour change of the individual roaster elements indicates the current operating status at all times. Both time-controlled and temperature-controlled roasting are possible with up to 10 intermediate steps. Like its larger counterpart, the roaster is equipped with a device for water supply in the cooling chamber for quenching the coffee. The roasting chamber also features a quenching function.

RFB-S

The RFB-S roaster is a small roaster used for the development of roasting recipes and for use in quality control. The centrepiece of the roaster is the well-proven RFB roasting chamber with a capacity of up to 500 g of green coffee. The roasting process can be controlled via the recipe control in the PLC both via the product temperature and via time.

For cooling the beans, the times for water supply and the duration of fresh air supply can be continuously adjusted.

Technical data

- Batch size: 200 – 500 g
- Roasting times: ⩾ 1.5 min
- Heating source: electric
- Standard voltage: 3 × 400 V, 50 – 60 Hz
- Connected load: 13 kW
- Dimensions (L × B × H): 833 × 955 × 1760 mm
- Weight: approx. 200 kg
- Exhaust air connection: Ø 150 mm

NEUHAUS NEOTEC

Coffee is our life.®

Service hotline
+49 (0) 4221 859-799

NEUHAUS NEOTEC
Maschinen- und Anlagenbau GmbH
Fockestrasse 67
27777 Ganderkesee
Germany

+49 (0) 4221 859-0
nnsales@neuhaus-neotec.de
neuhaus-neotec.com

Directly to our website:
Scan the QR code now

NN 020 EN 2023