

Manual
Catalyst



BLUEFIRE

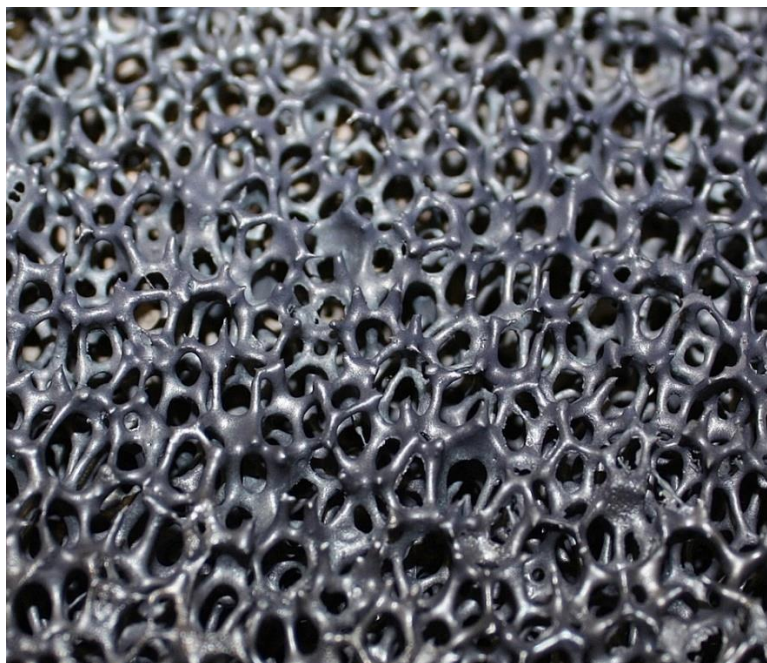
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General Information

Thank you for choosing a catalyst from Blue Fire GmbH. The catalytic converters from Blue Fire GmbH are characterized by a long service life and high emission reduction rates at economic costs.

In these operating instructions we explain the assembly, handling and cleaning of the available catalysts.

Picture shows Blue Fire Ceramic Foam Catalyst (Picture: Blue Fire GmbH)



Functional Description

The catalysts of Blue Fire GmbH work with different tray systems. All catalysts have in common the high activity in the field of application chosen by the customer. All catalysts are adapted to the customer's applications in terms of tray system and catalytically effective coating in order to achieve optimum emission reductions.

Installation Position Of The Catalytic Converter

The catalyst is to be integrated into the upper part of the combustion chamber of a furnace. It should always be noted that a permanent, direct flame contact at the catalyst can lead to deactivation of the catalyst. A short time of flame contact in the ignition phase does not damage the catalyst. To protect the catalyst from permanent flame attacks and to reduce the flow velocity, a flame baffle plate must always be provided in the direction of flow upstream of the catalyst, without exception. Our engineers will be pleased to help you determine the suitable position of the catalyst, the flame baffle plate and the bypass in the furnace. The catalyst must be integrated into the furnace in such a way that it flows through well. The

bypass prescribed by the standards for the various furnaces must be implemented in the installation area of the catalytic converter. The bypass must be dimensioned in accordance with the relevant standards.

Assembly Of The Catalytic Converter

Unpacking And Handling

The catalysts are coated with a catalytically active layer. This coating can consist of mixed metal oxides or precious metals. In order not to limit the effect of this catalytically active layer, the catalysts may only be handled with gloves, preferably disposable gloves.

Picture shows Protection gloves (Picture: Blue Fire GmbH)



Remove the catalytic converters from the transport packaging and carefully insert them into the mounting provided by the manufacturer.



Important: The catalysts are fragile and must only be handled very carefully. Avoid bumping and do not drop the catalyst. This could destroy the catalyst.

Inserting The Catalysts

The catalytic converters must be inserted into a fixing system so that they are securely fixed in the combustion chamber. The brackets are usually made of highly heat-resistant stainless steel, as the hot exhaust gases directly impinge on these components. The brackets and installation situations vary depending on the type of furnace.

The catalyst should be surrounded by a sealing cord at the material thickness so that it does not come into contact with metallic holders at these points and to prevent leakage of exhaust gases.

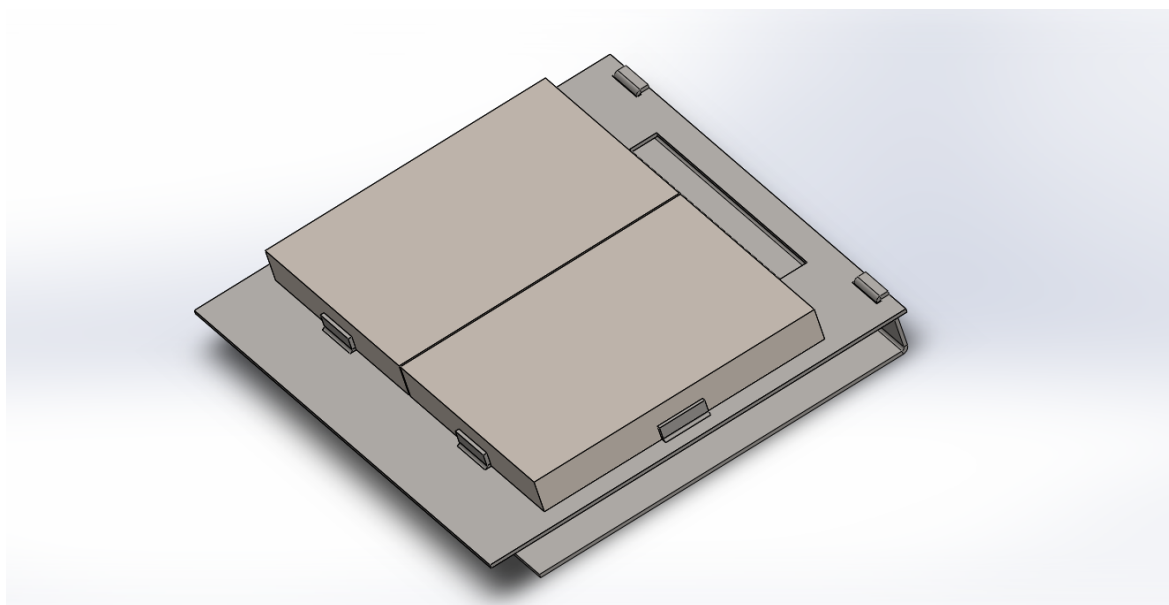
A little play or loose fit is necessary to compensate for the different thermal expansions of the two materials steel and ceramic.



Important: Be careful not to damage the catalyst when inserting it into the bracket. Make sure that the seal does not cover the catalyst surface to be passed through.

Then insert the holder, including the catalytic converters, into the space provided in the furnace.

Picture shows fixing system with flame protection baffle and bypass (Picture: Blue Fire GmbH)



Bypass

Catalysts in stoves (EN13420), fireplace inserts (EN13229) and sauna heaters (EN15821) may only be operated with a bypass. Before installation and commissioning, it must be ensured that a bypass has been created that meets the requirements of the standards mentioned.

Find here an abstract out of the standard EN 13229:

No.	Topic	Decision
13-01	filters in appliances <i>Filter in Geräten</i>	Clause 4.5.2 of EN 13229 (or the appropriate clauses in other relevant standards) applies also (30 mm / 15 mm for wood burning appliances of minimum dimension in the flueways). For appliances using filter designs not in line with this requirement the filters are handled like dampers and the appliances shall have a bypass of at least 3 % square area or at least 20 cm ² (in accordance with 4.14 of EN 13229 dampers). If none of the above safety relevant solution is chosen the appliance do not pass the hEN's.

Cleaning

Depending on the operating time, the fuel and the user behaviour of the operator, the catalytic converter must be cleaned, since coarse dust particles settle on the inflow surface due to the flow of exhaust gas. These coarse dust particles must be removed from the catalyst surface at least regularly. The operator must monitor the degree of contamination and decide when cleaning is indicated.

As an aid we show a clean Blue Fire catalyst and a dirty Blue Fire catalyst.

Clean Catalyst (Picture: Blue Fire GmbH)



Polluted Catalyst (Picture: Blue Fire GmbH)



Cleaning Devices

For cleaning you can use a hand brush, a brush or a vacuum cleaner. If you use a vacuum cleaner, please use only a brush top.

Picture shows cleaning devices (Picture: Blue Fire GmbH)



Ash Extractor

We also recommend that you use an ash extractor, which is available in DIY stores, for example, when vacuuming up ash.

Compressed Air

If the installation situation is difficult to access, we recommend cleaning the catalyst by blowing it off with compressed air at regular intervals. Avoid the release of dust particles into the installation room in any case. Also make sure that the compressed air does not have a pressure greater than 6 bar, otherwise the catalyst could be damaged. In any case, you should consult your furnace manufacturer or dealer in this case.

Picture shows compressed air pistol (Picture: Blue Fire GmbH)



Important: Make sure that the catalyst is not damaged during cleaning.

Allowable Fuels

Only the following may be used for heating: Logs and wood pellets in accordance with DIN 51731. Only air-dry logs with a moisture content of 15 to 24 % (13 to 19 % water content) may be used. The firing of any wastes is forbidden according to federal immission protection law, this can lead in addition to damage to the firing system and the chimney.

We point out expressly that it is forbidden to burn woods with nails or with metal remainders insides. In this case, the guarantee we have promised expires.

The use of soft woods can lead to increased abrasion and earlier blocking of the catalytic converter.

In addition, no painted woods or woods with paint residues or other deposits or coatings may be used.

If such woods are used, damage and failure of the catalyst may result.

The catalyst must be replaced if painted or otherwise contaminated wood has been used as fuel.

Important: Resin-containing softwoods lead to rapid blocking of the catalyst. Avoid the use of softwoods such as spruce or pine, etc.

Blocked catalysts may no longer be used.

The blocked catalyst must be cleaned before further operation. See page 6, "Cleaning".

Catalysts blocked with tar cannot be cleaned and must be replaced immediately!

Information:

Air-dry logs with a maximum of 24 percent water are achieved by drying for at least one year [softwood] or two years for hardwood.

Important: Wood is not an endurance burning fuel, which means that heating through overnight is not possible with wood.

Operating Time

The service life and the operating time of the catalyst depend on many factors, which primarily affect the user of the furnace. These are the following factors:

- type and quality as well as residual moisture content of the fuel
- Frequency of use of the furnace during the day and heating period
- the method of operation of the furnace, in particular correct air supply and correct temperature level
- Quantity and frequency of fuel application
- method and frequency of cleaning and maintenance of the furnace and the catalyst
- Protection against mechanical damage

If the aforementioned parameters are in accordance with the combustion manufacturer's specifications and these instructions, a catalytic converter should last for at least 3 heating periods without having to be replaced.

The responsible district chimney sweep can determine the faultless function of the catalyst also after the operating period of 3 years by an emission measurement. The operator must instruct the district chimney sweep master with an emission measurement.

The catalysts are analyzed in the technical chemistry laboratories of the Niederrhein University of Applied Sciences.

For this purpose, sample cores (1-inch diameter) are made from the Blue Fire catalysts and analyzed in a test rig. The parameters set in the test rig with regard to temperature and pollutant emissions are adapted as best as possible to the real application. Specifically, the catalysts are examined in the range between 50°C and 400°C and the temperature-dependent conversion of the carbon monoxide present in moist air (1000 mg/Nm³) is recorded. In the same way, aging takes place in the laboratory for 4000 hours (1000 operating hours per heating period as an assumption) at 400°C, mapping the lifetime over 4 heating periods.

The results of the tests show that the activity (light-off temperature) of the catalyst is unchanged even after 4000 hours of operation and is below 150 °C. From the point of view of the laboratory experiments, there is nothing to prevent the use of Blue Fire catalysts for a period of 4000 hours. However, it has to be taken into account that an individual early deactivation due to improper operation of the fireplace cannot be excluded (e.g. due to improper firing with large or moist amounts of wood etc.).

Prof. Dr. Andreas Roppertz
University of Applied Sciences Niederrhein
Adlerstr. 32
47803 Krefeld
Email: andreas.roppertz@hs-niederrhein.de
Tel: 02151-822-0

Disposal / Recycling

At the end of its useful life, after damage or improper use, the Blue Fire catalyst must be replaced. The used catalyst does not have to be disposed of, but can be recycled. The precious metals contained in the catalyst can be reused to a very high degree.

For this purpose, end users should return the used catalyst to the manufacturer of the furnace via the specialist trade. Blue Fire GmbH will take back the catalysts used from the manufacturers of the firing system, provided that they are delivered to our company address free of charge for Blue Fire GmbH.

Improper Use

The Blue Fire catalyst must not be fired with: Waste, plastics, varnish residues, paper, sawdust, oils, oil residues. Also wood with varnish adhesion, varnished wood or wood with other contaminations must not be used. Wood with nails or screws driven into it must also not be used.

The catalyst will be destroyed by such improper use and must be replaced.

It must be ensured that sufficient combustion air is supplied.

The Blue Fire catalyst is an oxidation catalyst and always requires an excess of oxygen in the combustion to function properly.

No changes may be made to the catalytic converter, otherwise the approval for the type-tested furnace with the catalytic converter and the warranty for the catalytic converter expire.

Only original spare parts may be used. These can be obtained from the manufacturer. Non-compliance will result in loss of approval and warranty.

Overloading of the Blue Fire catalyst which exceeds the determined and recorded values results in the destruction of the catalyst.

Retrofitting Of A Catalyst

In the case of catalyst retrofitting in a furnace that has already been operated, the operator is obliged to prove compliance with the valid emission limit value in accordance with the applicable laws and regulations. This is done by obtaining a written release of the fireplace with retrofitted catalyst from the responsible district chimney sweep.

Fire Protection Regulations

The respective national fire protection regulations must be observed and observed

Warranty Conditions And Warranty

You have opted for a catalyst from Blue Fire GmbH and thus purchased a product that is processed to the highest quality standards.

Unfortunately we cannot guarantee the durability of the catalytic converters and we also exclude the warranty for it, since the condition and function of the catalytic converter depends 100% on the behaviour of the user. Failure by the user to follow these instructions will result in damage to, or failure of the catalyst. However, we warrant that the catalytic converter will perform its intended function when delivered.

The quality of the catalytic coating is monitored and electronically documented during the production process. We therefore guarantee the promised coating quality and provide proof of this on request.

Damage caused by transport must be proven to us, and the damaged goods must be returned to us for inspection.

Furthermore, no liability is assumed for consequential damage caused by a defect, in the case of intent, gross negligence, breach of essential contractual obligations by the manufacturer and supplier, injury to life and limb.

The salvatoric clause applies to these warranty conditions and we refer to our general terms and conditions.

Technical Data

Metal Oxide-Catalysts

Start-Up Temperature Catalyst Type 023-00:	350° C
Maximum working temperature Catalyst Type 023-00:	800° C
Chimney negative pressure:	12 Pa
Pressure drop due to catalyst:	0,5 Pa
Optical Control of the catalyst ^{1,2,3}	1x / week recommended
Cleaning interval ^{1,2}	according to the specifications of the furnace manufacturer
Useful life of the catalyst Type 023-00 ^{1,2}	3 heating periods ^{1,2}

Noble Metal-Catalysts

Start-Up Temperature Catalyst Type 030-10 /-40:	250° C / 200° C
Maximum working temperature Catalyst Type 030-10 /-40:	650° C
Chimney negative pressure:	12 Pa
Pressure drop due to catalyst:	0,5 Pa
Optical Control of the catalyst ^{1,2,3}	1x / week recommended
Cleaning interval ^{1,2}	according to the specifications of the furnace manufacturer
Useful life of the catalyst Type 030-10 /-40 ^{1,2}	3 heating periods ^{1,2}

¹ Depending on the frequency of use, the type, quality and nature of the fuel, the quantity of fuel and the nature and nature of the firing and chimney installation concerned.

² Only valid if the information given in these operating instructions has been complied with without restriction.

³ It is to be decided by optical control whether the catalyst is blocked (tar formation on the upstream side) or whether it is covered with dust (see photo p. 7, this manual) and a cleaning is necessary or whether it is clean and can be used further (see photo p. 7, this manual).

Subject to optical and technical changes.

Revision-Index: 05/230915



BLUEFIRE

Blue Fire GmbH

Industriestr. 5

26683 Saterland-Ramsloh

Telefon +49 4498 92326-130

contact@blue-fire.org

www.blue-fire.org