


# EXTINGUISHES FIRES QUICKLY AND EFFECTIVELY

## FirExting® Inertgas

Gas extinguishing systems
with non-liquefied and
natural inert gases

Nitrogen
Argon
IG-541

WAGNER®



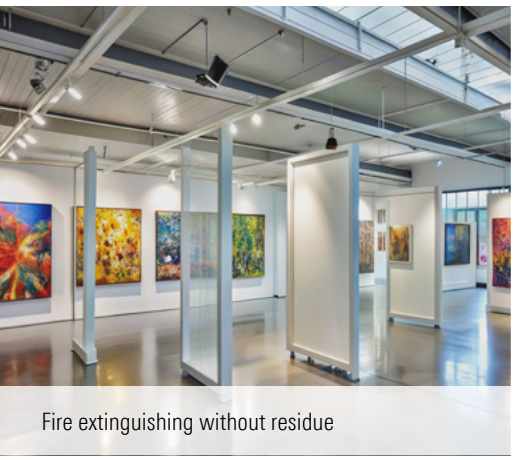
# MINIMISE FIRE DAMAGE – WITH NON-DESTRUCTIVE INERT GAS EXTINGUISHING

## Inert gas extinguishing systems from WAGNER make a crucial contribution in comprehensively protecting existential assets from fire damage

Effective technical protection from fire and its consequences is based on multiple interacting measures. It is based on a fire detection which must ensure reliable, earliest possible detection. Once a fire has been detected, suitable countermeasures must be taken as quickly as possible. After all, the shorter the timeframe between when the fire is detected and the extinguishing commences, the more effective the fire and consequential damages can be prevented.

**Fight fire without damage**

Aside from personal safety, protecting valuables and operational procedures take top priority during the extinguishing process. The extinguishing process must be ideally coordinated to the field of use and may not cause any damage itself. For that reason, WAGNER exclusively uses gas extinguishing for fighting fires with FirExting®. Suitable extinguishing gases can quickly and reliably stop combustion processes without causing damage and leaving residue on buildings, equipment and goods.



Fire extinguishing without residue



Prevents consequential damage to equipment



Protects from operational or process failures

**Individual solutions with inert gas extinguishing systems**

A fire extinguishing installation with inert gases is especially recommendable for areas with demanding protection requirements. This is the case if there are irreplaceable cultural goods or sensitive technology to protect, if maximum availability is required, or if there are special risks in the protected area on account of high fire loads, electrical energy or hazardous substances.

Thousands of FirExting® gas extinguishing systems are already in use worldwide today. Nitrogen is used in more than 80 % of inert gas extinguishing systems installed by WAGNER due to its favourable universal properties.

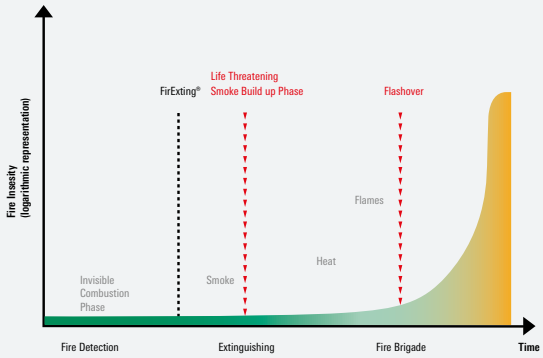
In the case of fire loads near the fire or certain metal fires, argon can also be used on account of its very high density and inertness. The extinguishing gas mixture IG-541 (consisting of $N_2$, Ar, $CO_2$) can also be used as an alternative.

**Typical areas of use**

FirExting® systems protect rooms and buildings from small server cabinets to large warehouses:

- Server rooms, IT/EDP areas and data processing centres
- Building systems/control cabinets
- Telecommunication equipment
- Museums, archive rooms, depots
- High-bay warehouses
- Automatic storage systems
- Hazardous substance and flammable liquid storage
- Lacquering and powder coating systems
- Printing machines
- Tool machines

**Course of fire and intervention**




An automatic gas extinguishing systems earliest fire detection and quick intervention effectively prevent fires from spreading and the fires it causes.



# EFFECTIVELY STOP THE FIRE WITH NATURAL INERT GASES

Inert gases use a simple extinguishing principle: They suffocate the source of the fire by displacing the oxygen from the environment.

Fires can only break out if all three components of the fire triangle (oxygen, heat energy and fuel) are present. Feeding in ignition energy in the form of heat initiates a combustion reaction and causes the fuel and oxygen to begin reacting to one another. Once the reaction has started, fuel is continuously fed in the form of oxygen, giving off heat – a fire breaks out.

**Take the fuel from the fire**

When a fire is detected, the gas extinguishing system is triggered. This can take place automatically as well as manually. The area to be protected is flooded with extinguishing gas; the oxygen is displaced. This reduced the oxygen content in the protected area from the normal 20.9 vol% to a concentration set to the specific building, which stops the combustion process. After that, the concentration of extinguishing gas will have to be retained for a defined hold time (such as 10 minutes) in order to prevention reignitions. Inert gases are well-suited to effectively extinguish class A (solid substances), B (flammable liquids) and C (flammable gases) fires with this process.



**Extinguishing without side-effects**

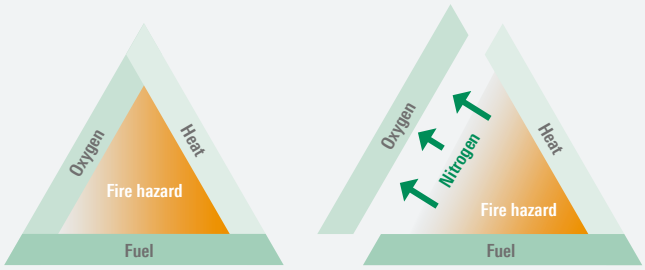
Inert gases enable residue-free extinguishing which prevents secondary damages such as those caused by the use of water, foam, powder or chemical extinguishing gases. Moreover, they do not react with any chemical compounds which occur in the usual fire scenarios. They do not conduct electricity and thus cause no short circuits during and after the extinguishing process. This makes them ideal for use in electrical and electronic systems. Inert gases spread quickly and homogenously throughout the entire room and thus dependably extinguish fire sources, even ones which are concealed.

**Simple disposal, quick refilling**

The inert gases nitrogen and argon occur in the natural atmosphere, are not toxic in concentrations for extinguishing fires, and can be disposed of without special requirements.

Refilling is a simple and inexpensive process, making the extinguishing system quickly ready for operation again.

**The fire triangle: Fire extinguishing through oxygen displacement**




Inert gas extinguishing reduces the oxygen concentration in the protected area and stops the combustion process by suffocating it.



# FIGHT FIRES EFFECTIVELY – WITH INDIVIDUAL CONCEPT

## Depending on the specific requirements, the non-liquefied inert gases nitrogen ($N_2$), argon (Ar) or IG-541 are used as extinguishing agents in FirExting® systems.

The extinguishing agent is supplied in pressurised cylinders and is used to flood the extinguishing zone in the event of fire. All of the inert gases for use in FirExting® systems are of natural origin, non-toxic, not electrically conductive and do not cause any visual impairments when used. It is easy to maintain concentrations of these gases which are suitable for extinguishing fires in the protected area, thus effectively preventing reignitions.

**Nitrogen ($N_2$)**

- Nitrogen is one of the most effective natural extinguishing gases.
- WAGNER is the first extinguishing technology provider to use nitrogen.
- Nitrogen has a similar density to air and spreads homogeneously in the room, thus taking effect very well.
- It is readily available and easy to obtain – 78.09 vol% of the atmosphere is made up of nitrogen.
- Refill costs are low.
- Nitrogen is versatile and universal in its applications.

**Argon (Ar)**

- Argon is a non-toxic noble gas which is contained in the atmosphere at up to 0.93 vol%
- Argon does not enter into any chemical compounds amongst the inert gases – even under extreme conditions.
- Thanks to its inertness, it is also used to fight fires at very high temperatures.
- Argon's high specific weight (38% heavier than air) makes it ideal for extinguishing areas with fire loads near the floor, as well as in raised floors.
- Refill costs are low.

**IG-541**

- IG-541 is a mix of natural inert gases which makes use of their respective benefits.
- It is made of 52 vol% nitrogen, 40 vol% argon and 8 vol% carbon dioxide.
- Due to its composition, the refilling costs with IG-541 are a bit higher than those with nitrogen or argon.

FirExting® can be tailored precisely to meet many different requirements: from system configuration for one or more protected areas to the right extinguishing gas. The decision as to which extinguishing gas to use is part of the specific planning process for the entire system.

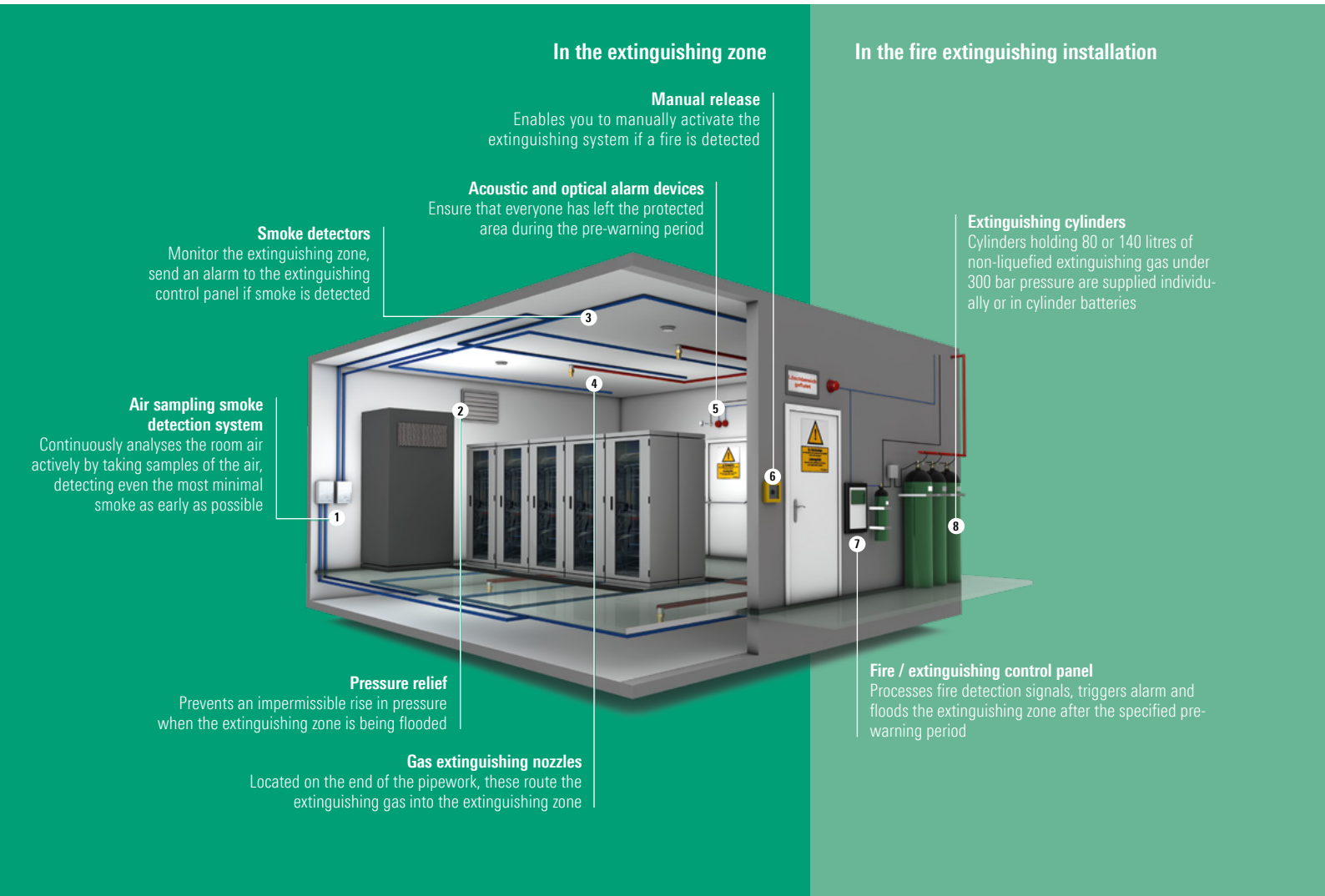
**Configuration and functioning of a gas extinguishing system**

A FirExting® gas extinguishing system consists of an extinguishing control panel outside of the extinguishing zone and a pipe network with extinguishing nozzles which leads into the extinguishing zone. If a fire is detected, the system will activate automatically or by manual release. First, persons receive a visual and acoustic alarm to let them know to leave the protected area. In terms of fire safety, operating media such as ventilation and air-conditioning systems must be shut down in order to prevent reignition. Doors and fire protection dampers are automatically closed.

After a delay period, the protected area will be flooded with extinguishing gas within the specified period (generally 60 or 120 seconds) in order to extinguish the fire once the extinguishing gas concentration is reached. This must be maintained for at least ten minutes to prevent potential reignitions.

**Single and multi-zone installations**

The figure shows a typical single-zone installation. Several zones (incl. zones of different sizes) can be protected by a FirExting® multi-zone installation. In this case, the extinguishing gas is transported to the protected area concerned through selector valves. A multi-zone installation is generally more cost-effective than having several single-zone installations, since the quantity of extinguishing gas supplied will be lower.







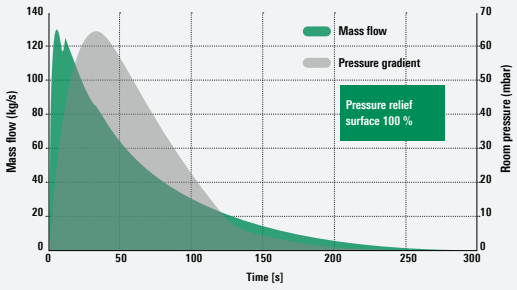
Flow regulator for soft flooding

# PREVENT PRESSURE PEAKS – WITH SOFT FLOODING

When gas extinguishing is released, the room pressure in the protected area will briefly rise. WAGNER Soft Flooding offers an effective solution for space-saving and cost-reducing pressure relief.

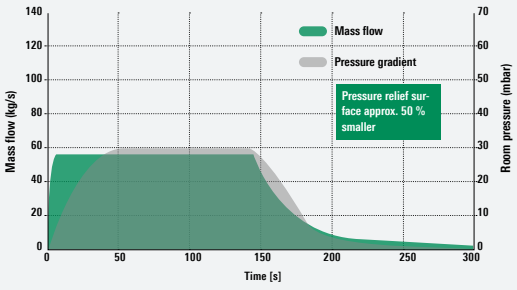
In order to build up a suitable concentration for extinguishing with a subsequent hold time, the protected area must be sufficiently tight. In the event of fire, the pressure in the room will increase due to the flooding process. Pressure relief devices are needed for compensation purposes. FirExting® systems from WAGNER are also available in a soft flooding version. The extinguishing gas cylinders are equipped with flow regulators. The protected area will be flooded with a constant and controlled pressure. The reduced pressure peaks enable smaller dimensions for the pipework and reduce the pressure release surfaces by more than 50%. This makes it easier to install gas extinguishing systems under difficult structural conditions, such as interior rooms.

**Extinguishing with standard flooding**




Sample mass flow and room pressure curve with classic inert gas flooding

**Extinguishing with soft flooding**




Sample mass flow and room pressure curve with soft flooding with inert gas



VdS-certified sound suppressor *SILENT*



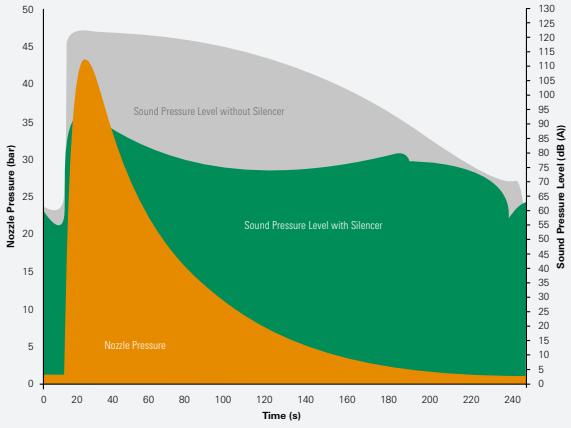
# SPECIAL PROTECTION FOR EDP SYSTEMS – WITH FirExting® *SILENT*

## Specially designed sound suppressors are used in IT areas to protect sensitive electronics from damage caused by vibrations.

When a gas extinguishing system is triggered, the rushing noise from the nozzles can reach a sound pressure level of up to 130 dB (A). This can cause hard disks and other sensitive parts to vibrate, thus damaging them.

WAGNER can reduce the sound pressure level of its FirExting® systems by 20-38 dB (A) through the use of VdS-approved *SILENT* sound suppressors. This makes WAGNER the first manufacturer to develop a solution which prevents data losses and damage to hard disks. The *SILENT* sound suppressor does not impair the system's extinguishing effectiveness. Retrofitting existing systems is possible and recommended.

**Measurement diagram**
**Reduced sound pressure level**




The *SILENT* sound suppressor prevents harmful sound pressure levels from forming, even at maximum nozzle pressure.



# SAFETY THOUGHT ALL THE WAY THROUGH – WITH US AT YOUR SIDE

## WAGNER develops concepts for fire protection – and implements them in each and every specific project as a VdS-certified installer.

WAGNER's mission is to serve its customers entirely from a single source. Our specialists are available to you from your first consulting session on building the system of your tailor-made fire protection solution all the way to ongoing maintenance. This way, we make sure that the solutions we develop fully meet your protection objectives – and comply with all guidelines and approvals which the legislators and insurers require.

**FirExting® has the following VdS system approvals for the permanent inert gas fire extinguishing systems:**

- FirExting® Inertgas 60: S319007
- FirExting® Inertgas 300: S303006
- FirExting® $N_2$-diffuser: S316010

**The optional sound suppressor also have VdS device approval**

- Sound suppressor *SILENT*: G310025

VdS Inspected. Approved. Safe.




**Always on the safe side**

WAGNER's holistic thinking includes offering the best service possible. This naturally includes supporting WAGNER gas extinguishing systems beyond installation and commissioning. In our maintenance offer, we provide regular system inspections and check for factors such as changes in room use and system configuration. In short: When it comes to safety, you can always rely 100% on WAGNER!

**In good company**

FirExting® gas extinguishing systems are used by thousand all over the world today. Thanks to their flexibility and outstanding efficiency, they make a major contribution to the safety of our customers.

# Fire protection as holistic solution. Trendsetting. Worldwide.



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**Fire Prevention**
Oxygen reduction: OxyReduct®

**Fire Extinguishing**
Gas extinguishing technology: FirExting®

**Hazard Management**
Organization via: Visu*LAN*®

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BETTER SOLUTIONS IN FIRE PROTECTION

WAGNER®