
BLUEPROOF
BUYS TIME SAVES LIVES
BLUEPROOF TECHNICAL BROCHURE
HOME FIRE PROTECTION FOR WATER-BASED SYSTEMS
BLUERAD

Bluerad is helping you protect your habitat.
The **Blueproof™** product is designed to work in a wide variety of buildings from homes, hotels, hospitals to schools.
Contact us today to find out how we can help your business. Whatever the challenge, whatever the building, you can count on us to provide the right solution for you.

BLUERAD

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INTRODUCTION

When you think of manufacturers and suppliers of fire protection, the **Bluerad** name may not be the first name that springs to mind. However, today we offer the world's first cost-effective fire suppression system for the domestic market. With any fire alarm in public places or buildings, we are drawn to think of the traditional water sprinkler system, but the traditional sprinkler system as an effective method of fire suppression has moved on.
This means that **Bluerad** is the ideal partner to work with you to deliver a fire suppression solution for your home at a price you can afford. The majority of residents have nothing fitted in their home, to protect them from fire and smoke.

Blueproof™ installation (or fitting) is a simple DIY task.

- It is designed to be used where water based central heating systems are installed.
- Fitted on the radiators it provides a new level of protection to many building types.

Blueproof™ is a revolutionary fire suppressant device. It allows extra time to effect an escape and for the emergency services to be called. In a house fire, **Blueproof™** delivers water where and when it's needed the most. It reduces smoke and may be the difference between life and death for you, your family and your loved ones. In light of the latest findings[1] showing that today's homes burn 800 times faster than the homes most of us grew up in, it is more important to get your family out of a burning home faster then ever before.

Fire alarms activate when children and the elderly may already be overcome by smoke our biggest killer. Fire is silent.

If you have the vision to transform your house, but are put off by the exorbitant cost of fitting current systems, fit **Blueproof™** now.

Ref [1] innovating fire attack tactics - New Science - UL.com (2014)

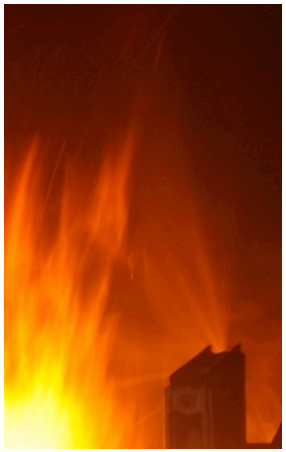
PERFORMANCE

Made from advanced thermoplastic materials: **Blueproof™** has outstanding activation speed. The material is chemical and corrosion resistant, non-toxic and taint-free. The result is a uniquely designed fitting, independently witnessed and proven in full-scale building fires, that delivered the following benefits:

- Temperature falls throughout a building in excess of 250 ^{o}C on activation
- Temperature falls below 50 ^{o}C at 1 m above floor level in fire area
- Temperature falls within the stair well and upper floors
- Flash over eliminated
- Oxygen levels stabalised
- Smoke stabilised significantly

Independently pressure tested by Seetru (Bristol) far in excess of the Department for Environment, Food and Rural Affairs Water Supply (Water Fittings) Regulations 1999

Built to withstand the toughest conditions to ensure longevity and durability. A giant leap in technology presenting outstanding quality and value, both practical and financial, to focused homeowners.



SYSTEM DESIGN CONSIDERATIONS

This section highlights engineering considerations when designing a suppression system with **Blueproof™**

Blueproof™ works with both open systems and combi systems, small and large bore pipe work. Made and manufactured from advanced, lightweight high-performance thermoplastic materials with outstanding chemical and corrosion resistance. The material is non-toxic and taint-free.

Resistance to impact
The thermoplastic materials used in the **Blueproof™** fittings have excellent impact-resistant properties.

Abrasion Resistance
Blueproof™ is suitable for the expulsion of abrasive solutions and will withstand the ejection of abrasive fluids found in radiators deposited by internal corrosion, industrial, rural water and even waste-water usage.

Weathering
The materials used contains pigments to provide protection against degradation due to the ultra-violet radiation in sunlight. Continuous use of **Blueproof™** in systems is therefore permissible without additional protection.

Electrolytic Corrosion
Blueproof™ is not magnetizing and does not cause electrolytic deterioration.

Thermal Insulation
Polypropylene has natural thermal insulation of 5 times that of copper and 4 times that of 1025 steel.

Light Transmission
Blueproof™ does not transmit light, thus protecting the water quality in radiators.

Effect on Water
Blueproof™ does not impart to water any odour, taste, colour, or any constituents in concentrations that could be hazardous to health.

20 year+ design life of Blueproof™
Whilst **Blueproof™** conforms to institutionalised specifications written to have a minimum life of 5 years, it is intentionally developed to exceed the expectations of these specifications. Its life expectancy is improved if kept out of direct sunlight and may be OK for up to 20 years[2]. However, we recommend they are visually inspected periodically to ensure the mechanical properties (indicated by clear discolouration) have not been degraded which may reduce its performance if needed in response to a fire.
Blueproof™ has been installed for the past two years on a fully functioning central heating system with no leaks or failures.
Ref [2] Polypropylene Degradation and durability estimates based on the master curve concept. Lecon Woo, Michael Ling, Atul R. Khare, and Y. Samuel Ding

Maintenance is negligible as **Blueproof™** has no moving parts and just needs periodic dry dusting. Polishes, paints and solvents can affect the longevity and mechanical properties of the material and are NOT advised.

STANDARDS

Blueproof™ is:

- in compliance with the EU directive 2001/95/EC of the European parliament and of the council of the 3 December 2001 on general product safety

- pressure rated to exceed the requirements of BS EN 442

- activated in half the time required for a sprinkler head during wind tunnel tests. BS EN 12259-1:1999 (Fixed firefighting systems-Components for sprinklers and water spray systems-Part 1:Sprinklers) Annex N (normative) Thermal response tests. Ref: Bluerad BRE 25th June 2015

  ASTM E84, NFPA 255, UL 723 and ULC S102

- Tested to ISO 5660-1-2002 Reaction to fire tests. Heat release, smoke production and mass loss rate. Part 1: Heat release rate (Cone calorimeter method) International Organisation of standardization Geneva. 2002

- Tested in full-scale fire experiments to ISO TC 021 SC 05 N634 Fire Protection-Automatic Sprinkler Systems – Part 13 International Organisation of standardization Geneva. 2013 using the BRE "ISO room" Ref: Bluerad BRE 25th June 2014

- Pressure Tested to BS EN 442 to failure and max temperature of 85°C

- Manufactured under a Quality Assurance scheme to ISO 9001

REPORTS AND RESULTS

All available from **Bluerad** on request:

1. Blueproof Active fire suppression system for domestic application: White Paper 10th February 2014

2. Seetru (Bristol): Pressure Test Results 23rd June 2014

3. Building Research Establishment (BRE): Temperature response experiments using pre-mixed flame ignition source Results 9th July 2014

4. Blueproof Report on BRE Results 6th August 2014 Draft

5. Building Research Establishment (BRE):Global Client Report. Bluerad fire suppression experiment. 7th August 2014 Report Number 296853 issue 2.2

6. Bluerad Report: Blueproof Experimental Results 4th November 2014.

7. Bluerad Report: Blueproof Demonstration at Ollerton Fire Training Centre Nottinghamshire 21st January 2015

You Tube links

Testing and fitting of Blueproof
Blueproof Fire protection for all
Blueproof fire house demonstration
Blueproof by Bluerad Ltd.
Fire Behaviour and Tactical Considerations Aug 23rd 2013 IAFTV NIST UL

FEATURES AND BENEFITS

Blueproof™

- High quality
- Fits directly into vent plug housing
- Quick and easy installation
- Does not require a power supply
- Self-targeting
- Installation: horizontal or vertical
- Maximum operating temperature 85 °C

Standard size $^{1}/_{2}$" into vent plug housing

Fitting

Bluerad have a team of Gas Safe plumbers who can fit the device in the home and can provide an estimate. A full set of instructions are printed on each label to enable DIY.

Returns Policy:

Satisfaction Guaranteed

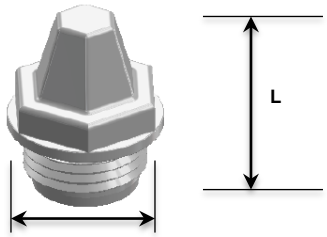
For your complete piece of mind, our products may be returned to us within 30 days of purchase for a refund of the purchase price. Items must be returned unused, at your cost and in mint condition. All items carry a manufacturer's 12 month defects warranty.

Duty of Care

It is the responsibility of the person in charge of the property to ensure all necessary steps are taken to prevent people being injured. On all commercial or institutional properties, a risk assessment should be carried out to establish how susceptible people are to the dangers of fire. If a person has taken all reasonable steps to ensure safety of those people living and working in the environment.

DIMENSIONS

Dimensions with 909 O_Ring



L Length	21 mm
D Diameter	25 mm
Weight Average	2 gramme
Flowrate (variable)	4 L/min at 3.5 bar *
Pressure	20 bar at 20 °C
	20 bar at 75 °C
Material	Polypropylene-based copolymer
"O"_Ring	Nitrile rubber

*Perfectly formed nozzle of a fire tested **Blueproof™** at BRE during flame impingement experiments. Ref: Report 3.

RADIATORS

In each of the rooms that require heating will be one or possibly more radiators. The function of the radiator is to convert the hot water generated by the boiler into the air temperature of the room. It stands to reason that the hotter the radiator temperature then generally the hotter the room temperature. Air is a poor conductor of heat so approximately twice as much water is stored in a radiator than is required to suppress a fire.

Radiator components

There are 3 major components connected to the radiator. For the radiator to function to its design it must always be vented of air and full of water. The air release vent, as its description implies, is where any air within the radiator can be released by using a special air vent key. **Blueproof™** replaces the vent plug but still allows venting of the radiator.

Please note that it is most important that your installer has instructed you on how to replenish the water levels within a sealed heating system before you attempt to release air from radiators. Your installer should have regulated the lockshield valve so that there is an 'even heat up' that takes place throughout the radiator, generally with an approximate 10 C – 12 C (20 C for condensing boilers) difference between the incoming flow of water and the outgoing returning water.

Combi boilers and water meters

Generally, combination (combi) boilers do not store any water; they heat the water instantly from the mains, on demand. There are some exceptions to this and generally speaking floor standing, oil or gas-fired combi boilers have a store of water, but the majority of wall-mounted boilers are instantaneous versions. When a hot water tap is operated and subsequently turned off, a small amount of expansion of that water takes place. Within the water regulations it is permissible for this expanding water to travel back down the water mains. If, however, a device has been fitted to prevent the water flowing back down the mains e.g. a water meter, a build up of pressure could occur between the turned off hot water tap and the meter. This could lead to the pressure rising to a high enough level to make taps or showers start to drip. Consequently, if you have a combi boiler and a water meter has been installed after the boiler was installed, it is important to check with your installer that an additional expansion vessel has been fitted to the mains water pipework. This will absorb all of the expansion water created by the generation of hot water. Expansion vessels should hold sufficient water to top up a system.

Radiator removal for decorating

When decorating a room it is more convenient to remove the radiator from its brackets to paper or paint behind it more thoroughly. Usually this means isolating the two valves either side of the radiator and opening the union nut connection will allow the water in the radiator to be drained into a container. The radiator can then be removed.

Replacing the radiator after the work has been completed means tightening the union nuts back to the radiator valves and then turning the valves back to where they were previously set. If, however, the boiler is a combi and is run on a sealed system, the system will need re-pressurising .

This is now by far the most common arrangement of heating system with a combi boiler. Within the system (either within the boiler hydraulics or within the system pipework) will be a filling link. This allows mains water to enter the system pipework and radiators via a temporary hose connection or key, filling the system with water until the pressure gauge reads generally around 1bar. When the heating or hot water system is on, the gauge will rise. However, when the boiler system is cold, the gauge should revert to around 1bar. Your installer should have instructed you on how to operate the filling link. In a fire the internal pressure in the radiator will rise significantly. For example during experiment 4 at BRE the pressure increased to 9 bar within one minute.

Open vent primary system

An open vent system has a small feed and expansion cistern connected to the boiler and is generally located in the roof space.
This type of arrangement automatically fills the heating system and removes the need for a pressure gauge.

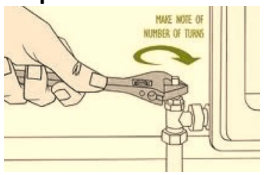
FAST AND EASY TO INSTALL

When you fit **Blueproof™** you are significantly increasing the fire-protection of your home. In the event of a fire it may limit your losses and could save your life.
Bluerad are leading Expert Fire Suppression Engineers and can provide advice on all aspects of the **Blueproof™** suppression system including design and installation for the domestic, residential and commercial markets. No available fire suppression device on the market provides total protection but **Blueproof™** achieves more than most other devices. However, it has been proven that when the flames come close or a full-scale fire occurs **Blueproof™** activates faster than any competitive product.

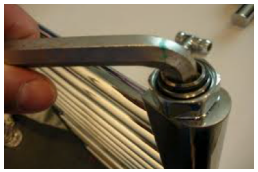
INSTALLATION

Step 1. Switch the central heating system off and allow to cool. Isolate the radiator by closing the isolation valves. Turn off the Radiator using the isolating valves at the bottom of the radiator. (Make a note of the position of the Lock Shield valve, if fitted, as this valve is used to balance the system and must be returned to the same position)

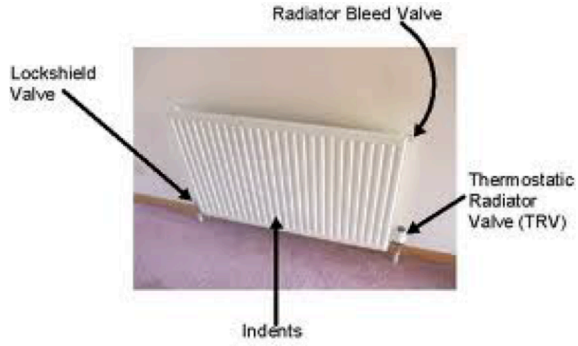
Step 2. If no valves are fitted to the radiator contact specialist.



Step 3. If a thermostatic valve is fitted, turn the valve to the closed position. If in doubt refer to manufactures instructions.



Step 4. Remove the vent needle from the vent plug. (Water will seep from the hole so care needs to be taken to catch the discharged water) Remove existing radiator bleed valve (vent plug) from the radiator (Water will seep from the hole so care needs to be taken to catch the discharged water). Clean the threads inside the housing from where the vent plug has been removed to clear any jointing products.



Step 5. Slightly open one of the radiator valves to allow water to run from the hole. When the water runs out of the hole close the valve.

Step 6. Select the **Blueproof™** device. Screw the device directly into the ½ " BSPT female thread in the radiator bleed valve housing.

Step 7. Insert the device ensuring that the "O" ring is in place and tighten it finger tight. Open a valve to turn the water on. Should water appear tighten slightly with a spanner to stop the flow. When satisfied that the water does not leak out of the device open both isolating valves. We do not recommend measuring torque as a guideline for installation.

Turn on the heating. If water is seeping from the device tighten further being careful not to over tighten. When no water is detected, turn off the heating, let the system cool down and check again. If no water appears the system is ready to be used.
To vent the radiator simply slacken and allow the air to escape.

HOW IT WORKS

Bluerad know that when central heating is fitted in your home the radiators are placed in the most strategic position to provide heat. It is this placement that is key to the success of **Blueproof™**. Placed at the top of the radiator, will send out a spray of water that is capable of reaching several metres. It replaces the vent plug.

Each Central Heating system is designed specifically to the home. Furniture and panels may obstruct a fire but will only delay its activation.

HIGH PERFORMANCE

Blueproof™ is a patented fire suppression device to supply water from the central heating system. It works when the heat from the fire is sufficient to activate the device by softening and melting its heat sensitive face allowing a spray of water to be driven into the fire. This creates a cooling effect throughout the room or building to suppress the fire.

Once activated, **Blueproof™** delivers the available water from the system. The diaphragm in a combination system can provide additional pressure to drive the water.

Fire suppression commences within seconds of activation. Temperatures fall dramatically within the first few minutes. Thermal imaging has proven that **Blueproof™** held back the spread of fire, even with an open door, and still suppressed the fire.

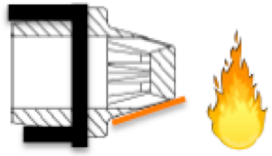
Complete Security

The advantage of **Blueproof™** is that it works 24/7/365 and if a fire breaks out responds accordingly.

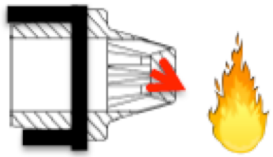
If you have any questions, we are always ready to help.

Sequence of operation

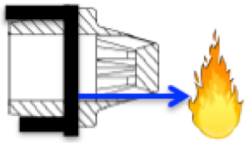
Fire Breaks out



The surface of **Blueproof™** starts to heat and soften on exposure to fire



The surface starts to expand towards the heat source driven by the internal pressure rise in the heating panel and softening at the surface as the temperature exceeds the heat deflection temperature of the material.



The surface starts to expand outwards towards the fire forming a discharge nozzle. The pressure in the system breaks through the surface forcing a stream of water directly at the highest heat source. Secondary Streams may form, dependant on the type of fire, and aim directly to the ceiling. Each forming stream reacts to the movement of the fire.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