FERNOX
MAKES WATER WORK

How to clean a system

Why should systems be cleaned?

Systems should be cleaned when commissioning a new system or installing a new boiler within an existing system. The purpose of cleaning and flushing is to protect against mineral oil contamination, particularly in low temperature hot water central heating systems by removing harmful flux residues and installation debris, which cause corrosion.

Cleaning existing systems removes black sludge (iron oxide) and limescale which improves circulation and reduces fuel wastage and boiler noise.

What should be done?

New Systems

Fernox Cleaner F3 or **Cleaner F5** should be added before commissioning the system. Simply circulate **Fernox Cleaner F**3 or **Cleaner F5** for at least one hour when the boiler is switched on, after which the system should be drained and thoroughly flushed until the water runs clear.

Existing Systems

Ideally the system should be powerflushed to remove any existing treatment and contaminant. **Fernox Cleaner F3** or **Cleaner F5** should be added to system water and circulated hot for at least one hour. After which the system must be drained and flushed until the water runs clear. The cleaning time can be extended to up to one week for hardened iron oxides and limescale.

For both new and existing systems, a **Fernox TDS meter** should be used to ensure efficient flushing by comparing the readings of the system water and mains water. The system is thoroughly flushed if the readings are within 10% of each other.

Protecting new and existing systems

In accordance with Part L of the Building Regulations, after cleaning with **Fernox Cleaner F3** or **Cleaner F5**, add **Fernox Protector F1** with the final fill water for long-term protection against corrosion and limescale.

All **Fernox Protector F1** and **MB-1** products are compatible with mixed metal systems, including aluminium as well as plastic pipes. For continued protection, check Protector levels annually using the **Fernox Protector Test Kit** or **60 sec Protector Check Kit** and top up the level as required.

Protecting against mineral oil contamination

Hot water central heating systems can become contaminated by the mineral oils used to protect steel components i.e. radiators from corrosion during the manufacturing process and before installation. If the oil is not removed, rubber parts within thermostatic radiator valves, motorised valves and other fittings can become swollen, resulting in component failure. Oil can also cause pump seizure where the bearings become fouled.

New installations

The risk of failures can be eliminated by pre-commission system cleaning using **Fernox Cleaner F3**. Cleaning should be undertaken in accordance with the recommendations set out in BS7593:2006. Commercial low temperature hot water and chilled water systems can be cleaned using **Fernox HVAC Cleaner F3**. After which the system should be protected using **F1 Protector** for domestic or **HVAC Protector F1** for commercial systems.

Existing systems

Clean the system using either **Cleaner F3** or **Powerflushing Cleaner F5**, drain and thoroughly flush before dosing with a **Fernox Protector F1**.

Where failures have occurred, the failed components should be replaced together with all similar components, as these are also likely to have been affected by the mineral oil.

FERNOX
MAKES WATER WORK

How to prevent corrosion

What causes corrosion?

Corrosion occurs when a refined metal reverts back to its natural ore state. Corrosion in water systems takes place when two areas of metal with a different electrical charge are in contact or linked via a conductor such as water.

What should be done?

An inhibitor should be added to system water to reduce the rate at which corrosion takes place. To determine the existing level of protection simply use the **Fernox Protector Test Kit** or a **60-second Protector Check Strip** to measure the concentration of inhibitor within the system.

Over and under-dosing with inhibitors
Although manufacturers specify a recommended dose rate for their product, it is important to find out how a product performs when over or under-dosed. Anodic passivating products will require a sufficient dose to 'coat' the internal surfaces of the system, plus some excess to maintain this film. If the dose is below the level required to achieve sufficient protection, exposed areas of metal will continue to corrode. Over-dosing with anodic inhibitors is unlikely to have any detrimental effect. Oxygen scavengers and cathodic inhibitors will not be fully effective if under-dosed, but will have a partially protective effect.

Negative impact of contaminants
The presence of contamination by flux residues, existing corrosion sludge, residual cleaning agent, or even washing-up liquid may adversely affect the performance of an inhibitor and lead to corrosion. To make sure an inhibitor performs as effectively as possible, it is advisable to clean the system thoroughly before treating. The **Fernox Water Test Kit** or **Total Dissolved Solids (TDS)** Meter can be used to check that a system has been adequately cleaned and flushed before an inhibitor is added.