

Aquafacts No. 20

Chemical water treatments

(Aqua-Nouveau Limited acknowledge the United Kingdom Water Treatment Association for the majority of the contents of this fact sheet).

Chemical water treatments can generally be categorised under 3 headings:

Chemicals to reduce hard water lime-scale precipitation. These work by adding a small quantity of phosphate to the water which reacts with the dissolved mineral ions responsible for lime-scale keeping them in suspension when the water is heated. Dosing devices usually have a reservoir containing phosphate pellets which typically need to be replenished once or twice per year. (Cost of replacement for a typical 3-4 bed house is circa £30 per annum). Devices are usually plumbed-in at the cold mains water inlet or before an individual appliance.

Chemicals for domestic wet central heating.

There are four main types:

1. system cleanser,
2. corrosion inhibitor,
3. noise reducer,
4. leak sealer.

These are generally available in liquid (bottle) form and concentrate/gel (cartridge) format with one unit usually sufficient to treat a system with up to 10 radiators. Aerosol-type products deployed by a propellant have also recently entered the market. Older heating systems can easily be treated with all types of product dosed via the feed/expansion tank. Closed, pressurised systems are more easily treated using cartridge or aerosol products introduced via the feed loop or a suitable radiator bleed vent.

Cleaners. These may be sub-divided into products which meet the different requirements of new and older heating systems and should be selected according to requirements (Some products are suitable for universal application): A pre-commissioning cleanser should be used to remove commissioning debris (such residual machining swarf and mineral oils from the

manufacturing process) and solder flux residues used in Construction. A sludge remover should be used to remove magnetite, sludge, scale and corrosion debris from an older system, for example when the boiler is replaced. Note that when using mechanical assistance (such as a powered flushing machine), to cleanse a system, a more active specialist chemical with good suspension properties may be required to ensure that debris is effectively and rapidly removed from the system. A universal cleanser may need to be left in the system for an extended period of time.

Inhibitors.— prevent corrosion and should be added to a heating system at the time of final fill after thorough cleansing. Inhibitors must be capable of protecting the range of materials used in construction of the central heating system, such as steel, copper, brass and aluminium, and must be suited to fill water quality. Not all inhibitors can be applied universally and products should be selected accordingly. Inhibitors must prevent lime-scale precipitation which may lead to boiler noise in hard water areas and specifically formulated inhibitors are required to protect the metals in systems filled with softened water. Care should be taken to select a product capable of providing protection dependent upon the specific system and water requirements. The installation engineer should leave evidence (usually an installer label) indicating the type and date of installation of product installed. It is recommended that inhibitor level is checked on an annual basis.

Noise Reducer (Also known as a boiler silencer or de-scaler). These are usually added to systems already treated with an inhibitor in hard water areas to reduce boiler noise. Lime-scale often forms on the boiler heat-exchange surfaces leading to localised sub-nucleate boiling (kettling). Noise reducers work by

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slowly re-dissolving the precipitated lime-scale and react with the hardness ions to keep them in solution.

Leak Sealers are often added to inhibited systems which show evidence of weeping at joints or under screeded areas to avoid the need to carry out otherwise costly repairs. They work by affecting surface tension at the leak and are most effective for sealing small capillary leaks.

Chemicals for the treatment of water in storage tanks and swimming pools – Usually involving disinfection through chlorination (or addition of bromide-based chemicals) and treatment to prevent microbiological growth. At the present time the treatment of swimming pools is outside the scope of the UKWTA. Anyone with enquires is directed to the Swimming Pool and Allied Trades Association: www.spata.co.uk

Why use them?

The use of cleansers and inhibitors in heating systems is required for compliance with Part L of the Building Regulations (as specified in the [Domestic Heating Compliance Guide](#) - published May 2006) and BS7953:2006 Code of practice for Treatment of Water in Domestic Hot Water Central Heating Systems. Members of the UKWTA were instrumental in helping to revise these regulations and fully support compliance in all installations.

Which product is right for me?

There are a wide variety of products on the market. Special care should be taken to select a product suitable for the particular application and water quality. Consumers are advised to question installers as to the suitability of products being used.

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Aqua-Nouveau comments

Chemical water treatments must not normally be used in isolation. If water hardness is above 200ppm the Building Regulations state that additional treatment must be incorporated, such as a water softener. We would be pleased to advise further on all aspects of this fact sheet.



A selection of chemical products available from DIY stores, builders merchants and plumbing suppliers.