

Water Treatment

In closed hot water heating systems water treatment refers to the addition of a chemical that inhibits the development of oxygen based corrosion. Oxygen, as air, enters a system through a wide variety of ways such as pump and valve seals, micro-fissures in pipe fitting threads, and of course in fresh make up water that replaces water leaking from a system. In plastic fittings the act of oxygen migration through plastic pipe wall is well documented.

Once in the system oxygen acts aggressively with iron and to a lesser extent copper, to form oxides that we know as rust. Oxide formations develop in a variety of ways. The most common are pitting and scaling. Pitting is the development of many small but intense attacks on the inside wall known as tubercles that result in a pinhole under each tubercle. Scaling is another type of corrosion in which deposits build inside the walls. These deposits block the flow of water through the piping, insulate heat exchange surfaces and shed small particles that circulate through the system causing other problems.

The best remedy for an older system under a corrosion attack is to first wash the system with a mild detergent while it operates in a normal manner. Then a running flush to drain removes the detergent and all of the matter it has loosened. The system is refilled and then an inhibitor is added. Usually the inhibitor compound has a three-fold effect. Firstly it raises the pH of the water to a value between 8 to 10, well above the point at which water has any acidic tendency. Next it coats the inside of the pipe with a thin-walled protective compound to protect against abrasion by circulating material. Finally an oxygen scavenger neutralizes free oxygen before corrosion can occur. These components of the inhibitor are consumables and become depleted over the course of time. The system must be checked frequently for the first few months and on a routine basis after that. Such a timetable might be once a week for the first month, once a month for the next six months and every six months after that.

As the inhibitor is non potable an approved back flow prevention device must be installed on the make up water line if such a device is absent from the existing system. The RPBA has the important job of making sure the boiler water cannot back flow into the buildings potable water supply. This could occur if the building water pressure falls below the boiler water pressure. The presence of the RPBA is made mandatory in the BC Plumbing Code and is often overlooked by heating contractors and service organizations.