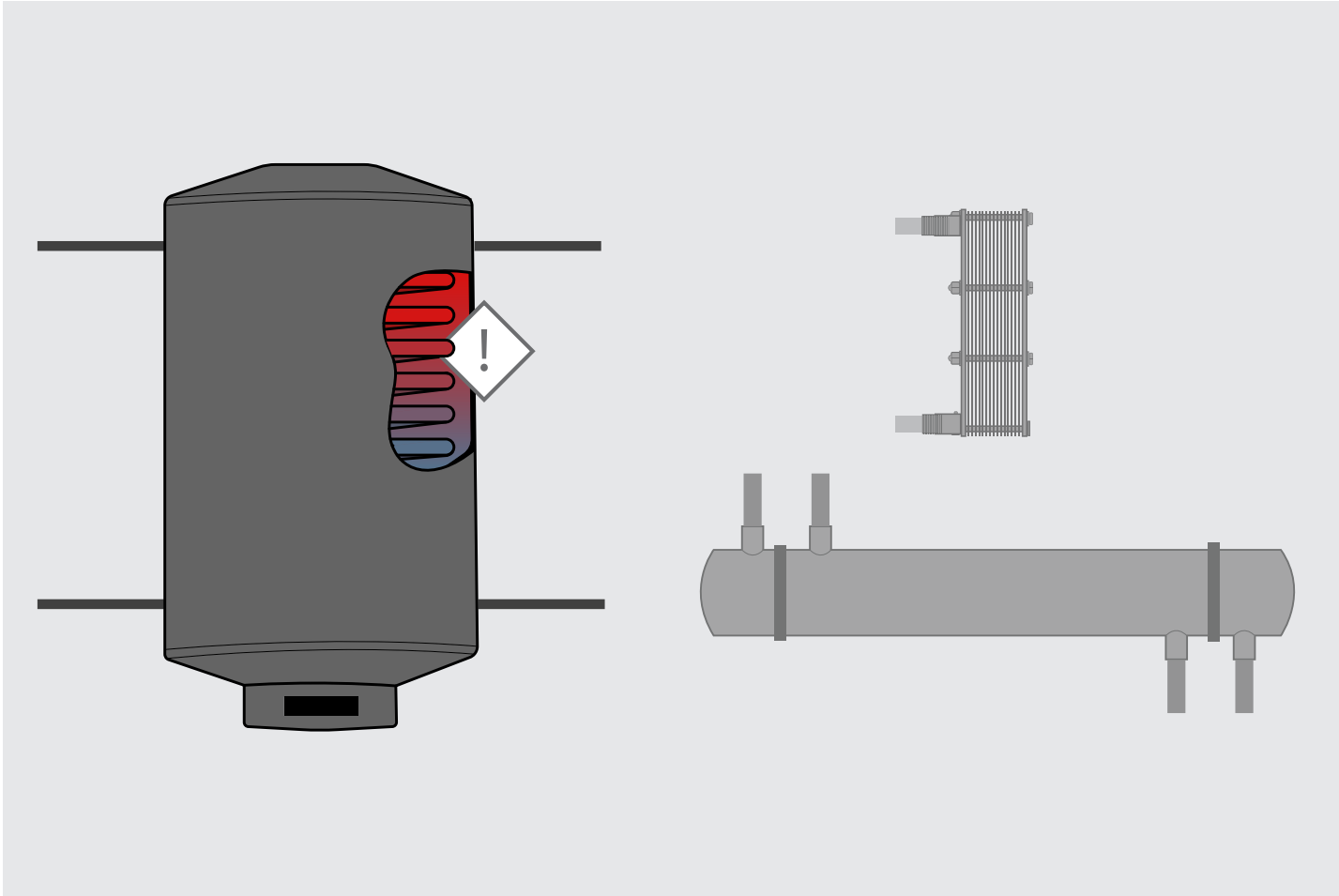


RICA 06 - breakdown of indirect potable hot water heater



RISK OF OXYGEN ENTRY

In the event of a leak of the heat exchanger that heats the hot water (PWH) oxygen-rich potable water can enter the heating circuit. This problem may go unnoticed for a long time, with catastrophic consequences in terms of corrosion and possible scale formation.

OPERATION

In many cases the heat generator (boiler) not only provides heating but also heats the potable hot water (PHW) through a heat exchanger.

A heat exchanger works with the counter-flow principle: water (central heating water and PHW) passes each other in opposite directions in separate channels. Thus, heat is efficiently transferred from one medium to another.

A heat exchanger can consist of plates or tubes, or a spiral or double jacketed exchanger built into a storage vessel. Such a vessel is usually called an indirectly heated "boiler".

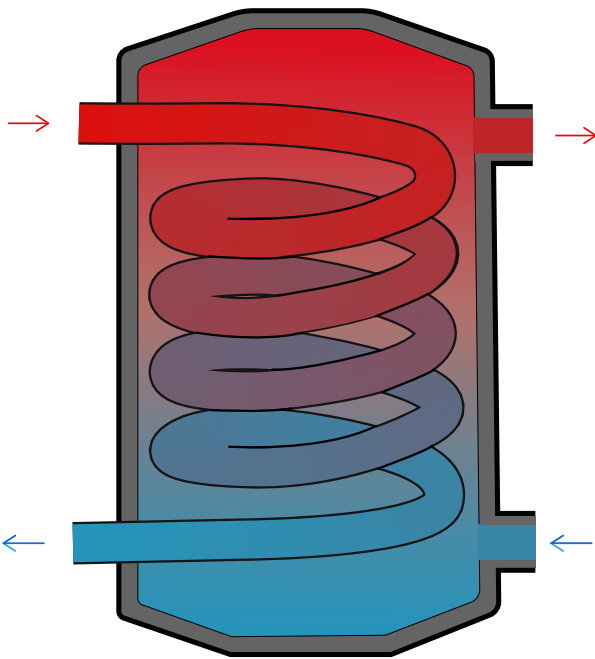


Fig.: boiler

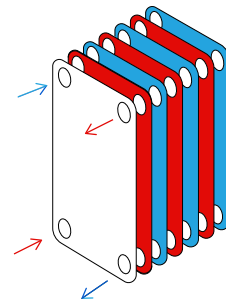


Fig.: plate heat exchanger

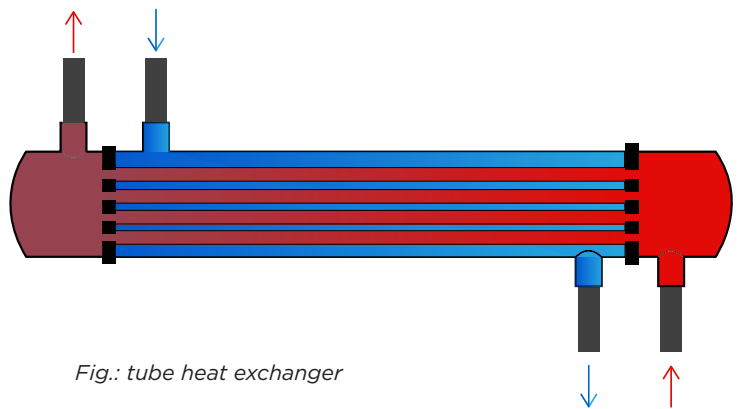


Fig.: tube heat exchanger

RISK OF OXYGEN ENTRY

Under normal circumstances, there is no direct contact between the domestic hot water to be heated and the water in the heating system. The two are separated from each other by the heat exchanger (plates, tubes, tube coil or vessel wall.)

In a normal single-walled heat exchanger, **a leak will cause the oxygen-rich potable water to leak into the central heating circuit**, since the pressure on the sanitary side will almost always be higher than that of the central heating installation. In this way, the heating circuit is permanently topped up with sanitary water. In the event of a major leak, this will immediately be noticed because the pressure on the central heating system will rise. In practice however the leaks are very small and the entry of sanitary water into the central heating water will often go unnoticed. Occasionally (especially in the warming up phase, e.g., after the cool down at night or over a weekend) the pressure will rise, and the safety valves of the heating system will open to drain the excess water. Since the discharge of the safety valves is usually connected to a drainpipe it is frequently not noticed.

The result: a constant supply of fresh, oxygen-rich water that causes damaging corrosion which goes undetected until it's too late.

There are several case studies available from Resus that illustrate the Risks covered in the Risycard series.



DID YOU KNOW?

Some heat exchangers are double-walled to exclude any risk of a leak between sanitary and central heating water: if one of the two walls leaks, the leaking water from the double-walled chamber escapes to the atmosphere. For constructional reasons, such heat exchangers are much more expensive and therefore not used very often.

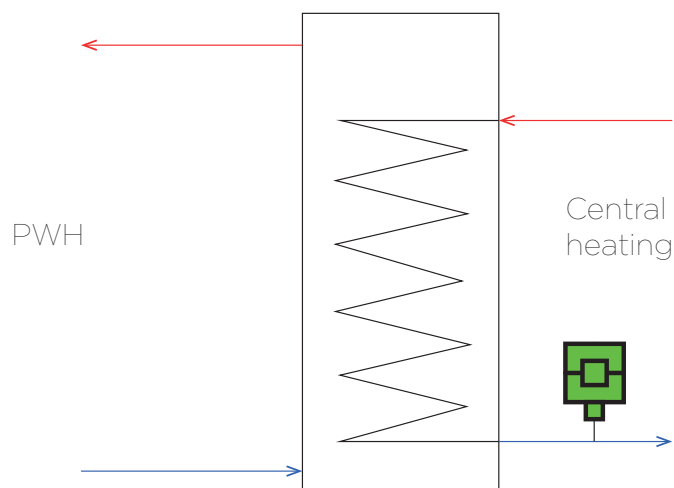
A leak between the PWH and the heating circuit can be the result of damage, a defective seal, faulty assembly, or a manufacturing defect.

If the leak is not detected in time the danger is not only the oxygen corrosion in the heating circuit, but also the quantities of hardness salts (calcium, magnesium) that enter the heating circuit. They deposit uncontrolled in the heat exchanger of the heat generator in the form of scale, which drastically increases the risk of loss of efficiency and overheating.

Leaks from sanitary to central heating water is a little-known problem, which can, however, have very expensive consequences.

THE IMPORTANCE OF RISYCOR

We recommend installing a Risycor on the return of the hot water boiler. In the event of a breakdown, the Risycor will immediately detect the increased oxygen intake. For a good follow-up of the entire installation, the recorded data should be checked using the Resus dashboard at least once a year.



ABOUT US

Resus is the manufacturer of Risycor, a system for continuous corrosion monitoring in closed heating and cooling systems. Like a smoke detector, a Risycor is an early warning system that prevents problems by providing an early warning.

Corrosion is ALWAYS the result of oxygen ingress, which in 90% of the cases is the result of poor pressure control. The remainder of the cases are often the result of failing risk components. Read more about this in our Risycards and Risybasics. The application of Risycor is explained in the Risycor Application Guidelines.

READ ALSO

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|---|--|
| RICA 01 - automatic air vents | RICA 06 - breakdown of PWH water |
| RICA 02 - green zone | RICA 07 - oxygen diffusion |
| RICA 03 - neutral point | RICA 08 - content indication constant pressure |
| RICA 04 - failing air non return valve | RICA 09 - clopen systems |
| RICA 05 - oxygen diffusion open bladder | RICA 10 - pre-pressure |