

## Are You Laying up Your Boiler for Christmas?

With Christmas around the corner, it's time to start thinking about how your boiler will spend the festivities. Will it be well treated and stable or untreated and corroding away, as you tuck into your turkey and all the trimmings? How you approach your boiler lay-up will depend on the start-up and shutdown steam demands of your particular system, your type of boiler, the time frame intended for the boiler to be out of operation, your chemical dosing arrangements, the type of chemicals used and location of dosing points, all must be considered.

BG04 Boiler Water Treatment Guidance, provides guidance under Section 8 for Idle Boilers, but yours might be slightly different and all systems should be regarded as bespoke, with their own particular set of requirements. Different sites have different boiler combinations and different designs of systems so we cannot possibly cover everything here.

If you are following BG04 correctly, then doubtless you will have carried out your BG04 Boiler Water Treatment Risk Assessment and within your RA document, should be your site specific shutdown and start-up procedures, from a water treatment perspective.

It is important to correctly follow the lay-up procedures for your boiler since incorrect water treatment and poor lay-up and maintenance procedures could lead to corrosion or other damage through the period of inactivity.

On your return to work and before you restart your boiler please read our CEA guidance note "Bringing Your Boiler Online From Cold" and following manufacturer's instructions to ensure your boiler has a warm and safe welcome to the New Year.



No matter how big or small your boiler plant - **P**roper **P**lanning and **P**reparation **P**revents **P**oor **P**erformance

When boilers are laid up it is important that the exhaust gas pathway (gas-side) through the boiler is thoroughly cleaned and all soot removed. This is much more easily done with the boiler hot, when the soot is drier and more easily removed than if the boiler is left to cool down, even for a few hours.

Where boilers are connected to separate chimneys it is best to leave the gas-side fully ventilated i.e. open up the burner or remove it and leave the exit damper (if any) fully open.

Where the boiler outlets are connected to a common chimney this cannot be done, otherwise the flue gases may discharge back into the boiler house through the idle boiler. In these cases, the exit damper must be shut.

**Note:** With hot water systems the system and boiler should be left full of properly treated water, albeit that some inhibitors do not perform well in static conditions and are best deployed in systems where the recirculation pump is run regularly – ideally for at least an hour a day.

Often different industries operate shift patterns in different ways, so there may be periods of time when steam is not required on site, often at weekends or at night after a late shift. If this is how your site operates you might want to consider keeping your system hot and up to pressure to avoid leaks and possible water hammer when restarting production.

You may have considered saving energy by shutting down the boiler because the company wants to save money on fuel, but is this the best method for your site and equipment? You may have considered allowing the pressure to drop but keeping the boiler hot. Will allowing it to go cold cost you more in maintenance and downtime in the long run?

As mentioned above we cannot cover all eventualities, you will need to discuss your specific requirements with the relevant specialists.

**Note:** These lay-up procedures are relevant when dosing with Sulphite as the oxygen scavenger into individual boiler feed water lines. If you are using something different talk to your boiler water treatment specialist for advice. It is advisable that these activities are carried out by using a BOAS trained person.

### **1. Overnight Shutdown**

Under this circumstance it is sufficient to merely valve off the boiler, the boiler should stay hot and avoid cold start-ups. Ensuring that the oxygen scavenger reserve and pH are adequate and assuming that water treatment levels are all within specification:

**Steam Boilers (Shell and Tube Type)** 30-70ppm of Sulphite

**Steam Generators & Coil Boilers** 60-100ppm of Sulphite

### **2. Weekend Shutdown or for periods of up to 72 hours**

Under these circumstances it is sufficient to merely valve off the boiler, the boiler should stay hot and avoid cold start-ups. Ensuring that the oxygen scavenger reserve, and pH levels are adequate but boosting Sulphite levels 1-2 hours before turning off the boiler or generator by turning the dosing pump up to 100%, in order to immediately boost treatment levels.

**Steam Boilers (Shell and Tube Type) and Steam Generators & Coil Boilers** Aim to achieve 150ppm of Sulphite as a **minimum**.

### **3. Shutdown for periods greater than 72 hours and up to 10 days**

Under these circumstances it is sufficient to merely valve off the boiler, the boiler should stay hot and avoid cold start-ups. Ensuring that the oxygen scavenger reserve, and pH levels are adequate but boost sulphite levels 3-4 hours before turning off the boiler by turning the dosing pump up to 100% to immediately boost treatment levels.

**Steam Boilers (Shell and Tube Type) and Steam Generators & Coil Boilers:** Aim to achieve greater than 250ppm of Sulphite as a minimum. It is also important to maintain system alkalinities during prolonged shutdown periods.

### **4. Shutdown for periods greater than 10 days and up to 1 month**

Start by measuring the boiler chemistry to establish water conditions before lay-up and dose appropriately. When laying up your boiler it is up to you to decide how best to achieve a suitable and safe lay-up condition. Always discuss this procedure with your water treatment specialist to achieve the best results.

Here are some points that might help you decide how to best lay-up your boiler:

- When shutting down the boiler and allowing it to cool completely you will need to close the crown valve, and open the air vent but only at under 1 barg pressure, steam will escape but control the flow with the valve. This will avoid water leaving the boiler or possibly drawing a vacuum or damaging the pressure gauge.

- Ensure that the boiler is fully depressurised, and the air vent is open as per the normal manufacturer's instructions.
- Manually override the feed pump to raise the water level until it is seen to escape through the air vent, the boiler is now "water wedged" to minimise the internal surfaces that are exposed to air.
- Close the air vent when the boiler is fully flooded.
- Test the Sulphite reserve at least weekly to ensure Oxygen scavenger levels are sufficient.

Boost sulphite levels 5-6 hours before turning off the boiler by turning the dosing pump up to 100% to immediately boost treatment levels.

It is also important to maintain system alkalinities during prolonged shutdown periods. Treatment levels should be tested at least weekly, even when boilers are off-line, in order to prevent against off-line corrosion attack.

[Steam Boilers \(Shell and Tube Type\) and Steam Generators & Coil Boilers](#) Aim to achieve greater than 500ppm as Sulphite as a minimum.

#### **5. For longer shutdown periods**

If you have a boiler laid-up and out of service for any lengthy period of time, the key activity is to ensure that the internal steel works of the boiler are dried out as quickly as possible to prevent corrosion.

[Steam Boilers \(Shell and Tube Type\)](#) Ensure the boiler is fully depressurised, drain the boiler and systems, open all manways and mud holes and allow natural ventilation throughout the boiler to dry the internal metal surfaces to prevent corrosion. Forced draught with the use of heaters can help dry out the boiler more quickly.

[Steam Generators & Coil Boilers](#) Fully drain the coil and fill with an inert gas, such as nitrogen, then seal.

**Before you restart your boiler you could just:-**



**Or you could read the CEA guidance note:**

#### **“Bringing Your Boiler Online from Cold”**

**and following the boiler manufacturer's instructions to ensure your boiler has a warm and safe welcome to the New Year.**