

energy

The House Journal for the Clients and Staff of Cochran.
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COCHRAN

Welcome

In this edition of Energy we look at some of the core values that are the basis of our Products. It is quality, integrity and efficiency that we at Cochran have used as the foundation of our business ethos.

Energy efficiency is nothing new, it is the ever growing expectation of higher efficiencies and lower carbon consumption that maintains the drive to ever-increasing savings. The incorporation of digital combustion systems, inverter motor drives, and of course good thermal design of the boiler are well known and proven methods of reducing fuel consumption and carbon emissions. Looking to scavenge valuable heat through economisers that can save a further 5% on a conventional unit and up to 9% on our condensing range, thus reducing carbon reduction and increasing the savings on fuel. More on these on pages 9 and 10.

Of course to record, monitor and manage energy efficiency is extremely important and our Synergy system does just that. It is an essential tool for the energy manager in every organisation with boiler plant. For further information visit cochran.co.uk/products/synergy.aspx

The 'Quality' of the product is the proof of the pudding. We take quality very seriously. Long-time Cochran key man James Lynn, has recently been appointed Cochran's Quality Czar. He brings 47 years of experience, within all areas of the Company, to bear on maintaining and further improving our famous quality of service, production and after sales.

James' Quality Compliance Team is ably supported by our own Quality Inspectors and is in turn underwritten by our ISO 9001 credentials, audited by LRQA. Every pressure part is not only inspected by our own team at every stage of the manufacturing process but also by independent third party insurance assessors, with each design being fully verified through their offices.



Finally we look at our Spares Department, headed up by Vicki Shaw. Vicki and her team supplied parts into forty different countries last year, ensuring our customers' boilers kept running. The team in Spares supply the items you need to minimise down time. Few boilerhouses can keep a full inventory of spare parts in stock - that's why we do...

Even if your boiler is forty years old, or even older, Cochran have the records to identify that hard to find part to get you back up and running. For more information on the Cochran all-makes spares service check the article on pages 13 and 14, visit cochran.co.uk/spares or simply give them a call, they're always extremely helpful.

Thomas Ritchie, Group Managing Director

New Cochran Boiler Log Book

Cochran are now taking orders for their new, fully compliant Daily and Weekly Boiler Test Log Book.

Like everything Cochran does, this is a premium quality product that sets the standard for information and compliance in Log Books.

The hard-backed book includes key notes on EU/UK compliance and testing at the front, printed in full colour on high quality coated paper. The remainder of the book comprises a full year's worth of boiler and burner daily and weekly test notes pages, printed on uncoated paper for ease of writing.

Comes complete with place ribbon a foil blocked covers.



To register your interest today, simply email info@cochran.co.uk



Congratulations to our newly qualified Apprentices

Cochran are proud to have run an apprenticeship scheme for more than fifty years. The Company firmly believes that on-the-job training, underpinned by the theory learned at college, produces excellent tradesmen. A small ceremony was held in May to congratulate the latest apprentices to have qualified and welcome them to the Cochran family as time served tradesmen. They join over 325 Cochran apprentices to have qualified over the years.



Ronnie Martin
Apprenticeship in
Pipe Fitting



John Lister
Apprenticeship in Plating



Ryan Lupton
Apprenticeship in Fitting



Jordan Maxwell
Apprenticeship in Welding



Dean O'Connor
Apprenticeship in Welding

The Economics of Economisers

As fuel costs continue to rise inexorably, energy efficiency is top of the agenda for most boiler owners. Cochran has long been at the leading edge of advances in efficiency and fuel use reductions and today fits Economisers to most of the boilers that leave its Newbie factory. However, these environmentally responsible units can also deliver impressive cost savings when retro-fitted to almost any brand of industrial boiler.

What IS an 'Economiser'?

These units, which usually sit unobtrusively on top of a steam or hot water boiler, recover previously wasted heat from the hot exhaust gases they generate. The Economiser then uses it to pre-heat the boiler feed water, improving the system's overall thermal efficiency significantly.

The harvesting of this previously wasted exhaust heat as it is expelled through the flue, regularly delivers operational cost savings in excess of 5%, frequently pushing system efficiency to over 95%.

Cochran designs, builds and retrofits Economisers to all types of boiler. Use of heat recovery units are an important factor in maximising the efficiency of modern Steam and Hot Water generation systems.

A short Heat Recovery and Economiser survey enables Cochran's system efficiency experts to determine a plant's heat recovery potential. Whilst Economisers are most often fitted to natural gas-fired systems, Cochran can also design and fit specialist systems to some liquid-fuelled boilers.

Condensing and Standard Economisers

The standard economiser consists of banks of finned tubes, which the boiler exhaust gases pass over before entering the chimney stack. The finned tubes are used to maximise the amount of heat transfer surface available. The boiler feedwater is pumped from a thermal deaerator or hotwell tank, through the economiser tubes to increase its temperature, typically by about 45°C, before entering the boiler. The finned tube is typically carbon steel for gas firing, with a suitable bypass system to prevent corrosion when using a standby liquid fuel.

If a customer is primarily using a liquid fuel, the economiser would be manufactured using Stainless Steel to ensure longevity.

Where there are low levels of condensate rate return and high levels of relatively cold make up water it can be economic to use a two stage economiser system, often referred to as a condensing system. In addition to the 'standard' economiser

fitted at the rear of the boiler, which continues to be fed hot water from the deaerator, a second stainless steel unit is fitted in the flue duct. This is used to preheat the cold make up water from ambient before it enters the deaerator (or hotwell). With high levels of ambient make up water this system can add another 3-4% efficiency to the plant.

As the name suggests, it recovers a substantial amount of energy as the exhaust gases condense in the unit. As a consequence of this process moisture will condense out of the flue gases. This will be mildly acidic (hence the stainless steel construction) and will need to be neutralised before disposal.

Shanghai Tobacco

Shanghai Tobacco typifies a Cochran customer who has benefitted significantly from the development and retro-fitting of Economisers to its industrial boilers.

The Company, which is China's leading manufacturer of cigarettes, utilises large volumes of steam during the drying and processing of tobacco. It already operates three Cochran Twin furnace boilers at its factory in the famous port city, producing 70 tonnes/hour of steam.

The Cochran survey team visited to review their specifications for a further four 20 tonnes/hour boilers for their new facility. To match their efficiency and process requirements it was agreed that a two-stage economiser system would be fitted to each boiler.

Cochran designed a two-stage system, consisting of a conventional carbon steel first stage economiser mounted at the rear outlet of the boiler and a stainless steel second stage economiser mounted in the flue ductwork. The high volume of cold make up water is passed through the second stage economiser, entering at ambient and leaving at a raised temperature. This water then enters the deaerator where it is further heated to 103°C before being pumped through the first stage economiser and entering the boiler at 132°C. This increased the boiler design efficiency by an impressive 9%.

Ask Cochran to fit an economiser to your boiler and achieve paybacks that will please your accountant and improve your plant's green credentials.

Installation of a Cochran economiser frequently increases boiler efficiency by as much as 9%.

Why choose a Cochran Economiser System?

The Cochran design is based on a standalone economiser unit rather than being integrated into the rear smoke box of the boiler. This has the benefit of flexibility to fit the boiler / economiser system within the confines of the boilerhouse, whether it be vertical or horizontal.

Whether the economiser is fitted to the rear of the boiler or is standalone, the removable side panels allow easy access for cleaning and maintenance. Unlike other designs, there is no need to isolate the boiler and cut into the rear smokebox to access the economiser for maintenance.

Cochran economisers are designed with water and gas bypass systems as appropriate to protect them from corrosion when firing liquid fuels. The gas bypass coupled with temperature control also enables better atmospheric exit temperature control, which can be used to prevent startup plumbing for example.

When specifying an economiser, most people concentrate on the additional efficiency at full load and at these outputs the Cochran standard design adds at least 5% efficiency to the boiler. However, the Cochran design also achieves such high gains across the firing range, by maintaining a continuous flow of water through the whole economiser tube bank at turndown, compared with header type designs which have limited exposure to the boiler flue gases.

In summary, requesting Cochran to fit an economiser to your new boiler plant or requesting them to investigate retro-fitting a unit to your existing boiler plant is a ideal way to optimise the efficiency of your plant, achieve paybacks that will please your accountant and improve your plant's green credentials.

Below: Sitting neatly atop a boiler, or positioned as a standalone item, a Cochran Economiser is a compact, highly cost-effective box of tricks that can deliver an impressive 9% boost in system efficiency.





James Lynn Locks-in Quality

Cochran has long been renowned for designing, manufacturing, delivering, installing and maintaining high quality products and Services across the globe. To maintain its position as the market leader Cochran's continuous drive for improvement has led to the creation of a new, but very important role. The introduction of a Quality Compliance Manager is set to deliver an even higher level of focus on quality and customer satisfaction through increased control and customer contact. Cochran's mission, primary driver, even passion is to provide an excellent customer experience.

James Lynn was recently appointed as the Quality Compliance Manager; focusing on all aspects of quality from order inception through to handover and beyond. James is a long-time Cochran stalwart with a great passion for the brand. Starting his career with Cochran as an Apprentice fresh from school, he rose through the ranks during a 47 year-long career (so far!) to become Factory Manager at the famous Newbie Works near Annan.

Apprenticeship and my early days at Cochran

My career at Cochran began in August 1970 as an apprentice. The first year was spent learning the standard engineering disciplines before moving into a specialist trade. I started my journey as a Plater manually marking off tube plates for drilling - no CNC machines at that time! We were still manufacturing Vertical boilers in the 70s - 'welded not riveted!' Back then everything was manufactured on site; we even had our own foundry and two huge presses.

The boiler shops were dark and extremely noisy; with Caulkers chiselling away with riveting guns it was deafening. Most of the internal movement in and around the factory was on rail lines that extended out to our River Annan slipway and all the way to the main rail track; the old shunter 'Blinking Bess' was still operating back then.

Cochran almost goes up in smoke!

Disaster struck in July 1974 when pitch from re-roofing resulted in a major fire. I was astonished to see the factory ablaze on the news, with gas bottles exploding and a large plume of black smoke over the site. When we returned to work almost nothing was left of the old wooden shops... Everyone worried this was the end of Cochran, but our owners rebuilt - it was a very tough time for our phoenix company. By 1977, as 'NEI Cochran Ltd', the Company had become part of a large group of companies, often manufacturing components for other parts of the group. In 1989 we joined Rolls Royce Industrial Power Group and our identity was re-established as 'Cochran Boilers'. Around 1983 one of the Foremen was off ill for a few months, so the Boilershop Manager asked me to stand-in right out of the blue. It was a huge challenge and led to me regularly acting as temporary foreman over the next few years, before finally 'officially' becoming Boilershop Foreman in 1990.



One of James' primary objectives as Quality Compliance Manager is to ensure that everyone at Cochran is totally focused on matching the needs and expectations of its customers.

In 1996 I stepped up to join the Cochran Project 'Dream Team'. We undertook a comprehensive six month review of manufacturing at Cochran which led to some key changes in the business. My role changed again in '97 and I became Product Stream Leader for Small Boilers, responsible for all the units manufactured in the range.

Works Supervisor to Manufacturing Manager

2000 saw a promotion to Works Supervisor; a job I held until 2005 when I was further promoted to Manufacturing Manager. This new position was both a huge challenge and a great opportunity; one I truly relished during the twelve years I spent in the job. I took great pride in being Manufacturing Manager, I am proud of the people, proud of the product AND proud of the high esteem in which Cochran are held in worldwide.

An exciting new initiative

Last year I was given the opportunity to undertake a different, but highly important new role within the business. I see the pivotal position of Quality Compliance Manager as a challenge, but one I will give the same positive focus and commitment to that I have done in all my other jobs. One of my main objectives in the role is to ensure that everyone within Cochran is fully focused on the needs and expectations of our customers.

140 Years of Quality

For almost 140 years we have been delivering the very highest quality to our global customer base, which is a source of great pride to us all. Personally, having conducted many factory tours with both existing and potential customers, I am proud of the fact that the quality of our product shines through... We have fully dedicated, highly qualified people in all our departments.

Our goal is to ensure we all work together to enhance our customers' experience; from the first point of contact, right through the delivery of world class after sales support; on every product and throughout its operational lifetime. We know this can only be achieved if everyone drives towards clearly defined objectives. To this end we are working on enhanced internal communications and everyone is fully aware of the crucial part they play in the continuing success of Cochran.

We are a company that has always led the way through innovation and development; providing an optimum solution to customers, whilst maintaining the highest level of build quality and documented control. The world is changing; our markets are changing too and we must continue to develop every opportunity... To do that we need to be able to demonstrate our impressive capabilities, our commitment to success and our drive towards maximum customer satisfaction.

World beating energy solutions can also come in smaller packages

Cochran boilers are globally renowned for their quality, reliability and durability and are especially well-respected for medium to large steam outputs... But did you know that Cochran boilers are also available in production capacities as low as 455kg per hour?

If you are involved in food and drink manufacturing, laundry services, healthcare, hospitality, or you're a boutique brewer or craft distiller, you too can benefit from Cochran's unbeatable Scottish-built quality, efficiency and reliability... And they cost less than you'd expect.

Boilers by Appointment

Smaller outputs are particularly attractive for the brewing and distilling industries where large volumes of steam and hot water are required for heating, cleaning and fermenting. In fact, Cochran are already the boiler of choice for many of the world's top whisky brands, so smaller 'boutique' distillers and craft breweries are safe in the knowledge they're choosing a proven solution to their needs.

Numerous leading professional laundries, hotels and resorts, schools, colleges and hospitals across the UK also utilise Cochran units, such as the compact Borderer, in outputs ranging from as little as 455kg/hr up to 6,000kg/hr.

These smaller capacity boilers help maximise efficiency through reduced operating costs by matching optimum output to actual requirement, whether utilised as a primary boiler, or as a backup during peak demand.

Numerous other pharmaceutical, leisure, farming, food and drink manufacturing, processing and packaging businesses also benefit from reliable, cost effective steam and energy provision delivered by a Cochran boiler.

Cochran's famous quality and efficiency comes in small packages too!





Annandale Distillery

Improving Efficiency

Whilst Cochran boilers are famed for their efficiency, the use of Economisers to recover exhaust gas heat for in use in pre-heating boiler feed water improves the system's thermal efficiency significantly, delivering fuel cost savings of 5%+.

Heat recovery units are also valuable contributors to cost reduction in operations generating waste process or exhaust heat. The large diesel engines and generators, furnaces, kilns and ovens frequently used by manufacturers and processing businesses can all be harnessed to generate 'free' energy. This can be returned to the process or sold-on to nearby users, such as schools, housing estates, healthcare facilities or cattle or poultry sheds.

Cochran Hire

When businesses require additional steam output, or simply wish to avoid front-loaded capital expenditure, Cochran's containerised 'plug and play' Boiler Hire is ideal to meet short or long term peak flow, or breakdown or service shutdown requirements. Boiler skid and packaged ancillary skid unit options are also available.

Turnkey Installations

Cochran's turnkey system design, specification, manufacture, construction, installation and commissioning option is ideal for smaller operations. It takes the headache out of ensuring your facility has a correctly specified, installed and fully integrated energy solution by providing you with a well-proven total solution that enables you to concentrate on your core operations.

Of course, though they are famously reliable, every Cochran boiler is backed-up by the largest network of Engineers in the UK, supported by a comprehensive spares solution, 24/7 breakdown cover and fully accredited operator training; ensuring your Cochran boiler operates at maximum efficiency.



Professional Laundries: Utilising substantial volumes of heat during cleaning, professional laundries 'punch above their weight' in terms of requirements for steam and hot water, making even relatively small establishments ideal customers for Cochran's compact low volume boilers. Waste heat generated also has excellent potential for recycling using a Cochran heat recovery unit to reduce overall costs.



Small Distilleries and Micro Breweries: Cochran's recent project for Annandale Distillery, close to the Company's headquarters, typifies its work with smaller whisky and gin makers and breweries. The project entailed a comprehensive turnkey installation within the old building of the site which had been returned to production after a break of more than 90 years.




Food Manufacture and Processing: The manufacture and processing of food traditionally requires substantial volumes of steam for ingredient preparation, hygiene, processing and canning. Cochran's compact low volume boilers provide world-beating 'big business' quality and reliability at a size and cost that makes them highly attractive for smaller businesses operating in the food sector.



Healthcare, Education and Hospitality: Every site that involves the care and/or accommodation of substantial numbers of people inevitably requires large volumes of steam and hot water for heating, cleaning, washing, food preparation and laundry. Lower volume Cochran boilers are ideal to cost-effectively meet the needs of hotels, care homes, private hospitals and clinics, schools and satellite campuses.

Water Treatment

The chemistry of the water in your boiler can be a major factor in the performance of your system and the working life of your boiler... Get it wrong and you could be heading for breakdowns, serious reductions in efficiency and ultimately the extremely costly replacement of your boiler years earlier than should be necessary.



As a leading manufacturer of industrial boilers, Cochran find that the most common cause of operational problems and failures in boilers is a poor or inadequate water treatment regime. In fact, research has shown that this issue is the root cause in more than 95% of all boiler failures.

Poor water treatment is the result of a badly managed regime; something that advice and adjustment can usually easily and cost-effectively correct; potentially saving you thousands in breakdown costs and loss of production.

Gin Clear?

No matter how clear it looks, all sources of water contain impurities which are harmful to industrial boilers. As a result, all feed water must be pre-treated and then chemically treated, either to remove these impurities or minimise their adverse effects.

Of course, most boiler operators, engineers and managers do not hold a PhD in water treatment chemistry, nevertheless boiler staff need to have a basic knowledge of the effects the water and its subsequent treatment can have on their boiler plant and its ancillary equipment. Engaging suitably trained personnel to monitor and manage water quality, is a sensible way to address the problem.

The boiler industry's trade associations; ICOM Energy Association (ICOM) and the Combustion Engineering Association (CEA); have recently launched a Boiler Water Treatment Guide (BG04) specifically for personnel involved in the operation and management of industrial boiler plant.

Cochran strongly recommend that anyone with responsibility for their facility's boiler plant obtain a copy of this informative booklet from the CEA, cea.org.uk. Ideally they should also attend one of the regular CEA seminars covering water treatment, as well as a number of other key risk management aspects.

Your responsibilities and the need for 'competence'

As scale becomes more extreme, the temperature of the boiler's metal surfaces can actually reach softening point... **This can ultimately result in a catastrophic, life threatening explosion.**

The ultimate responsibility for Health & Safety matters; including risk assessment of boiler plant and its associated water treatment; lies with the employer's 'Duty Holder'. This nominated officer should appoint a 'Responsible Person' within the boilerhouse team to manage feed water chemistry for them.

The responsible person would normally action the risk assessment with assistance from outside bodies like the boiler manufacturer, controls specialists and water treatment advisors. Alternatively a third party water treatment contractor can be brought in to manage the whole process on their behalf.

It is of fundamental importance that the statutory 'Duty Holder' and 'Responsible Person' are properly trained. If they have not been formally trained by a qualified trainer they simply cannot be deemed 'competent' to manage any industrial boiler system.

Common Problems

Poor water treatment can result in a number of different problems, depending on the water quality and chemistry and how it has (or has not) been treated. The main problems are scale deposition, corrosion, foaming and priming. Taking each in turn:

■ **Scale:** When 'hard' water is heated, Calcium and Magnesium salts can be deposited on boiler surfaces as 'scale'. This deposit that 'furs up' your kettle also seriously impedes tube capacity and heat transfer between the boiler's tubes and its furnace... So at its most basic level, more heat is required to generate the same amount of steam with, as you would expect, an attendant decrease in efficiency and increase in fuel costs. The thicker the scale, the greater the impact.

As scale becomes more extreme, the temperature of the boiler's metal surfaces can actually reach softening point. This can ultimately result in a catastrophic, life threatening explosion.



Research has shown that water quality is the root cause in more than 95% of all boiler failures.

Pre-treating the water to 'soften' it, supplemented by further conditioning should be undertaken to prevent scale.

■ **Corrosion:** In boiler water treatment, the most common form of corrosion is called 'pitting'. This is caused by the presence of Oxygen in the water and most often occurs in an alkaline water chemistry. Eliminating oxygen and keeping alkalinity under control will extend boiler life considerably. Cochran have come across well attended boilers that have had 15-20 years use without the need for re-tubing. Conversely others have been rendered inoperable in under a year due to corrosion - an extremely costly result of ineffective treatment.

■ **Foaming and Priming:** 'Foaming' is the bubbling out of foam to the steam main, whilst 'priming' is the release of water droplets into the steam distribution system.

Boilers are designed to have a suitable steam offtake velocity and steam storage space to ensure that the steam entering the main is more than 98% 'dry'. Mechanical scrubbers can be installed to achieve even higher levels. This figure is based on adequate boiler water quality. When contaminants are present, serious foaming or priming becomes more common and can cause difficulties.

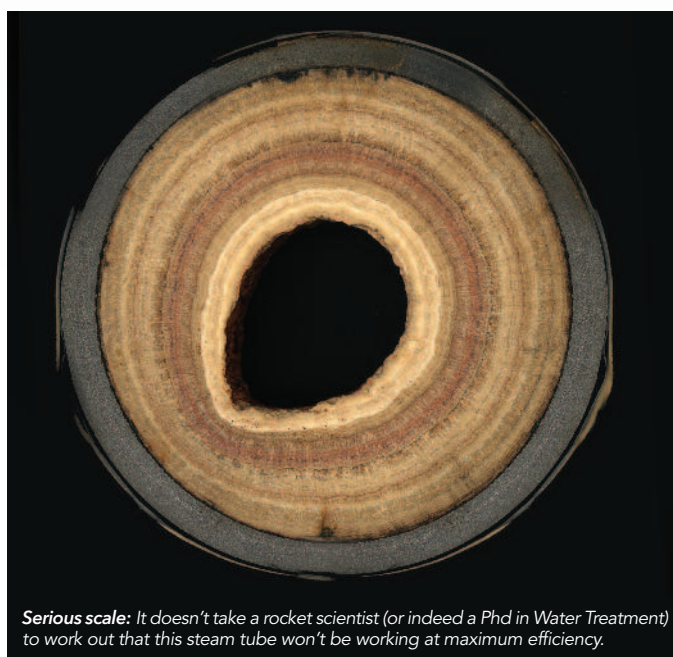
In serious priming, gross carry over of significant volumes of boiler water into the steam main can result in water hammer which can be very dangerous and can cause serious damage to the boiler.

Water level controls are designed to operate IN WATER, NOT foam; so if foaming is present it can lead to boiler lockout. What is more, foam in contact with tube surfaces does not conduct heat away as effectively as water, potentially resulting in boiler overheating. Carryover as a result of foaming can also precipitate out in the steam system as priming, causing operational issues such as blocked valves and steam traps.

High levels of Total Dissolved Solids (TDS) also increase the tendency to foam. This issue can be further exacerbated by high alkalinity levels in process water; either those occurring naturally or as a result of overdosing of water treatment chemicals.

Mitigating Water Issues

Cochran recommends that every boiler site engages a specialist water treatment company to test feed water and design a system that matches process water quality with the site's pre-determined operational parameters. Daily checks on boiler water, feed water and condensate properties should also be carried out by competent, trained site personnel. These records should be available to both the specialist contractor and boiler inspectors during their routine scheduled visits.



Serious scale: It doesn't take a rocket scientist (or indeed a Phd in Water Treatment) to work out that this steam tube won't be working at maximum efficiency.

The better the boiler water pre-treatment and lower the TDS levels, the less energy has to be wasted on blowdowns.

To avoid scale and improve the quality of water entering the boiler, water pre-treatment should always be carried out. Nevertheless, even after the pre-treatment phase, the water will still require further conditioning or chemical dosing.

- **Water Quality:** It is important that the water entering the pre-treatment plant is clear. When using normal mains supply this is not usually an issue, but if the water source is a spring or a well, a front end filtration plant may be required.

This clean water is then 'softened' by passing it through a special resin which exchanges the scale forming magnesium and calcium ions with sodium ions. Sodium salts are highly soluble and do not form scale when the boiler water's TDS is maintained at an acceptable level. When the ion exchange capacity of the resin is exhausted, it is regenerated using a brine solution.

- **Alkaline Water:** In areas where water has high alkaline hardness and/or in large boiler plants; especially where there is little, or no condensate return; use of Reverse Osmosis (RO) may be necessary after the softening phase. RO is increasing in popularity and offers a more reliable method of improving water quality. The very low levels of dissolved solids entering the boiler can drastically reduce the amount of energy lost through TDS blowdowns, offering a respectable payback on the increased capital cost of this process.

- **Conditioning:** After an effective pre-treatment has been carried out, calculated additions of a chemical sludge conditioner are added to precipitate any remaining traces of hardness salts, which can then be removed through the blowdown system.

- **Reducing Corrosion:** To reduce the opportunity for corrosion within the system, oxygen should be eliminated from the boiler and the boiler water maintained at the correct pH. Removal of oxygen is normally carried out by physical thermal deaeration. The higher the water temperature, the lower the levels of oxygen saturation. For the majority of boiler applications, a simple hotwell tank fitted with a steam spurge pipe to pre-heat the feed water to around 85°C is commonly used. The hotwell is then followed by dosing with a scavenger chemical to neutralise any remaining oxygen.

An alkali booster may also need to be dosed into the pre-boiler system and the boiler itself to prevent corrosion if the feedwater is acidic, especially when carbon dioxide is present.

- **Bottom Blowdown:** Raising steam will naturally increase the concentration of dissolved and suspended solids in the water of the boiler. These can be controlled by blowing the boiler down. All boilers are fitted with a bottom blowdown which is used to control sludge deposition.

The blowdown valve can be opened manually or automatically on a timer. The valve is periodically opened for a short, sharp burst, setting up a wave action in the bottom of the boiler that dislodges any sludge that has built up.

The fitting of an automatic continuous surface blowdown system is also recommended. This monitors and controls the levels of Total Dissolved Solids in the boiler, which should be kept below 3500 ppm, but ideally less than 2500ppm. Obviously the better the boiler water pre-treatment and lower the solids, the less energy is wasted on blowdowns.

The safe installation and application of blowdown systems is covered by a separate CEA guidance document (BG03). This should be known and understood by all concerned in the management and operation of the Boilerhouse

- **Water Treatment Quality:** Unfortunately Cochran comes across numerous instances of inadequate water treatment leading to a build up of scale. When a boiler inspection reveals scale, Cochran recommend that it should be removed; even if it isn't serious enough to put the boiler's pressure parts at risk. As previously described, small amounts of scale can dramatically reduce boiler efficiency and increase fuel costs. Boiler scale can easily be removed during inspection by utilising a specialist contractor to undertake a chemical descale.

When boilers stand idle

If the boiler is merely being left overnight, then no special actions are required. However, for longer shutdowns of up to a week, sulphite levels should be boosted prior to shutting down the plant.

For periods of up to a month, the boiler should be fully flooded and the water pH checked to ensure it remains in the range of pH 10 -11.5, with a sulphite reserve of at least 500ppm. Water analysis should be checked weekly during idle periods and corrected as necessary.

For periods exceeding a month, the boiler should be drained, and the man doors and mud doors left open to help ensure the inside is completely dried. A source of hot air should be ducted into the mud hole, and the boiler inspected from time-to-time to ensure that it remains fully dry.

How can Cochran help?

Cochran always recommends that sites engage a reputable specialist to oversee their water treatment regime. This expert will regularly inspect the hardware and water quality tests, adjusting the water and condensate conditioning as necessary.

Cochran also supplies a range of hardware packages, including pre-treatment softeners, dosing equipment, deaeration systems and a blowdown vessel with heat recovery system. These can be supplied loose for on-site installation, or packaged into a compact 'skidpac', this can be pre-piped or connected on site as part of a turnkey installation buy the Cochran team.

■ **Risk Assessment Solutions:** Cochran also provide comprehensive guidance on undertaking boilerhouse risk assessments tailored to your specific facility. This includes a review of the current water treatment regime and an assesment of the competence and training of your staff. This review covers other key areas like safety; legislative compliance and best practice; controls and automation; and plant efficiency, reliability and resilience.

■ **Cochran Training:** The CEA BOAS courses are seen as the gold standard in training for boilerhouse managers, technicians and operatives. Cochran are a CEA-accredited training provider; delivering this pivotal course at the Company's Newbie Training Centre, your own facility or another preferred venue.

These invaluable courses cover all the main aspects of water treatment and the potentially catastrophic consequences of getting it wrong. The courses should be complemented in conjunction with specialist water treatment training to ensure staff understand the sampling they are undertaking.

■ **Emergency Assistance:** If things DO go wrong, Cochran offer a bespoke boiler cleaning service. The Company offers a full chemical descale service to remove any accumulated scale, enabling your boiler to operate with greater efficiency and significantly more safely; cutting costs and extending its life considerably.

To find out more about Cochran's comprehensive package of water treatment services and emergency breakdown assistance, simply call 01461 202 111.

Supplied in easily handled and used 25kg kegs, Cochran markets a range of water additives designed to deal effectively with most treatment regime requirements.



BioAlk 3 (SKU: BioAlk3)

BioAlk 3 is a concentrated alkalinity builder. This product is recommended for raising boiler water internal pH where the natural feedwater alkalinity or cycles of concentration are low. Hydroxide concentration is directly elevated to promote boiler internal softening and control of corrosion.

Disp 5 (SKU: Disp5)

Disp 5 is a boiler water treatment based on sodium hexametaphosphate, it is used to precipitate calcium hardness as a mobile phosphate sludge. It has been formulated with polymers that condition and mobilize the resultant phosphate sludge and aid in removal during boiler blowdown.

Oxy 2 (SKU: Oxy2)

Oxy 2 is a convenient to use liquid oxygen scavenger recommended for the complete removal of oxygen from Deaerator Heaters, Feedwater Storage Areas, Feedwater Lines, Condensate Return Lines, Boiler Internals and Closed Recirculating Water Systems.

Multi S18 (SKU: MultiS18)

Multi S18 has been specifically formulated to satisfy the water treatment needs of the low pressures steam raising boilers up to 350psig. This 'all in one' formulation containing sulphite to scavenge any dissolved oxygen in the feedwater, avoiding corrosion within the boiler; phosphate and hydroxide to ensure any small amounts of calcium/magnesium hardness present are precipitated in the bulk water phase and prevented from forming scale deposits by the incorporation of a dispersant.

Multi S9 (SKU: MultiS9)

An economical, multi-functional boiler water treatment recommended for the complete control of softened boiler feedwater. Multi S9 will control residual calcium hardness found in the feedwater or from condensate; adjust hydroxide levels for correct chemical balance; and eliminate dissolved oxygen, preventing pitting corrosion.

SIEMENS

Solution
Partner

Building
Technologies

**BOILERHOUSE
SPARES**



The Cochran Spares Team, left to right: Spares Interpreter Christine Thomson, Spares Manager Vicki Shaw, Storeman Robert Soutar, Spares Interpreter Kerrie Byers, Spares Interpreter Diane Boyde. The Cochran team have the experience and knowledge to provide valuable advice and assistance, no matter what make or model of boiler and ancillary equipment you are operating.

Every Spare for (almost) Every Boiler

Cochran supply all the parts, equipment and consumables required to optimise the efficiency and working life of steam and hot water plant. The Company's dedicated five-strong spares team has the experience and knowledge to advise and supply all items rapidly and cost-effectively. Parts for a long list of OEMs are held in stock, including Autoflame, Gestra, Hamworthy, Hopkinsons, Saacke, Nu-way, Spirax-Sarco and Siemens. Cochran holds over a thousand items in stock at its Annan HQ and has several agents located worldwide. Items in stock range from pumps, valves and gaskets to blowdown vessels, hotwell tanks and burners, all with rapid dispatch to meet your needs.

Parts for other leading boilers

In addition to the complete range of current and past Cochran boilers, the Company can also supply components for all makes of Industrial Boilers including Beel, Wellman Robey, Hoval, Fulton, Byworth and more.

Easy Online Ordering

Make shopping for spares easy. Cochran has years of experience supplying boiler spare parts and have developed an online arena to bring unbeatable expertise direct to you. The Company's aim is to make your search for spare parts as simple as possible. If you can't find the part that you require on the website or in the catalogue, please don't hesitate to contact the Cochran Spares Team.

UK Online Spares

The Cochran Spares website, cochran.co.uk/spares offers UK customers direct online access to a one stop boilerhouse shop. This comprehensive site enables quick and easy ordering 24/7, backed up by Cochran's swift dispatch service. The Company's comprehensive parts inventory is constantly being added to:

- Autoflame Systems and components.
- Blowdown Vessels.
- Boiler Plates and Tubes.
- Combustion Control Systems.
- Complete Burner Units and all spares to suit.
- Feed Pumps.
- Gas Analysis and Combustion Trim Systems.
- Monitoring and Communication packages.
- Siemens Building Technologies.
- Valves, Gauges, Glasses and Seals.
- Variable Speed Motor Packages.
- Water Level and TDS Control Systems.

Benefits of the Cochran Spares solution:

- **Extensive:** Any part for any boiler: Cochran has a huge database and stock holding of parts for boilers and equipment - old and new - for all the major boilermakers, and are the UK Siemens Solution Partner for boiler parts. The Company holds the largest in-stock spares inventory of any UK boiler parts supplier.
- **Support:** As the UK's leading boilermaker, Cochran also has the expertise to provide engineering support and authoritative advice on alternative parts for obsolete items. When required, parts such as tube plates, doors and furnaces, can also be re-engineered by the Cochran team.
- **Urgency:** The Cochran spares website provides 24 hour UK ordering and rapid delivery from stock. Same day UK delivery is also available if required.
- **Service Stock:** Cochran's Service Engineers carry their own stocks of commonly used items and offer loyalty discounts to service contract customers.
- **Customer Stock:** Cochran encourages customers to retain their own small stock of regularly used consumables or specialised items to help cut downtime to a minimum. Speak to the Spares Team for a stockholding recommendation tailored to your system.
- **Online Ordering:** European customers can order online at the dedicated Cochran Spares Website. Telephone ordering is provided for global customers... Fully supported by expert customer spares support from Cochran's highly experienced and knowledgeable team.

Key Spares Contacts

+44(0) 1461 202 111 cochran.co.uk/spares spares@cochran.co.uk

Opening Hours (UK Time):

Monday-Thursday: 8.00am to 4.30pm Friday: 8.00am to 1.00pm Weekends: Closed Out of Hours Support: 01461 306 006

Training Update

Cochran's small classes and closer personal attention deliver an unbeatable **93% PASS RATE**. Meanwhile, the flexibility to deliver **training anywhere you require** can minimise the time crucial personnel spend off your premises.

Major Training Material Revamp

Cochran has long had an international reputation for its highly authoritative boiler training courses, many of which are officially accredited by the CEA.

Now, in a major positive step, the Company is making significant investment in premium quality full colour literature that will set the new benchmark in communication within the boiler training industry. These publications are substantially restructured and re-written, providing even greater clarity for candidates, whilst the quality of binding and finish will ensure that these documents become handy operators' technical reference guides for years to come.

Cochran provide a comprehensive package of premium quality, Certified Industrial Boiler Training courses for every boilermaker's specification. These courses cover the full spectrum of customer needs; from introductory overviews, to boiler operator and management courses.

Important MCPD News

It is important to remember that the new Medium Combustion Plant Directive (MCPD) passes into law in December 2017.

During the last MCPD working Group it became clear that this significant change needed to be highlighted urgently; during the Conference Workshop the CEA Chairman asked delegates "Who among you knows anything about the MCPD". Shockingly, only six people out of an audience of thirty five new anything about it at all! Under the new MCPD rules emission Limit Values (ELVs) will be imposed on combustion plant of 1MWth Input and above. Plant must also be registered with the Competent Authority. All new boiler plants will have to fully comply by December 2018.

ELVs are now set for all fuels and the following pollutants:

- **NOx:** Compulsory measurement and reporting to the limits.
- **SOx:** Compulsory measurement and reporting to the limits.
- **Dust:** Compulsory measurement and reporting to the limits.
- **CO:** Must be measured and reported - no limits set... Yet!

The CEA are currently arranging some dates for a new one day MCPD seminar to further improve understanding of the new laws.

CEA Approved Training and Events

Cochran Training Courses

Date	Details
26-30 June	BOAS Steam (Category 2): Cochran, Newbie Works, Annan DG12 5QU.
1 August	One Day, Boiler Operations & Safety Awareness: Cochran, Newbie Works, Annan DG12 5QU.
2 August	One Day, Boiler Operation & Safety Awareness: Cochran, Newbie Works, Annan DG12 5QU.
28 Sept	One Day Boiler Operation, Safety & Awareness: Mercure Burton-on-Trent, Newton Park, Midlands DE15 OSS.
3 October	One Day Boiler Operation, Safety & Awareness: Mercure Livingston, Edinburgh, Scotland EH54 6QB.
1 November	One Day Boiler Operation, Safety & Awareness: Mercure Leeds Parkway, Yorkshire LS16 8AG.

CEA Technical Boilerhouse Risk Assessment and BG04, I-GAS & MCPD Update Conferences

July 18-20:	Chesford Grange Hotel, Kenilworth CV8 2LD.
Sept 26-28:	Crewe Hall, Cheshire CW1 6UZ.
Nov 14-16:	Hampshire Court Hotel, Basingstoke RG24 8FY.

Days One and Two:

- Technical Boiler House Risk Assessment to achieve compliance with Boiler Guidance (BG01), conference workshop. This enables you to meet your legal obligations under 'The Management of Health and Safety at Work Regulations' 1999.

Day Three:

- **BG04:** Industrial Boiler Water Treatment to help keep your boilers operating safely and in good condition.
- **I-GAS:** Industrial Gas Accreditation Scheme, for those working on gas equipment.
- **MCPD:** the Medium Combustion Plant Directive being transposed into UK Law 19 December 2017.

Bookings for these events should be made directly through The Combustion Engineering Association, cea.org.uk telephone +44 (0)1740 625 538 or email info@cea.org.uk