

# RETROFITS AND ENHANCEMENTS ARE COST EFFECTIVE WAYS OF IMPROVING BOILER PERFORMANCE



## AIR PREHEATER RETROFIT AND ENHANCEMENT



AIR PREHEATERS PLAY AN INTEGRAL PART IN THE EFFICIENT OPERATION OF POWER PLANTS. AS THE CONDITIONS IN THE PLANT CHANGE, FOR EXAMPLE BY CHANGES IN FUELS OR OPERATING CYCLES, DEMANDS ON THE AIR PREHEATERS ALSO CHANGE. WHEN THIS HAPPENS, HOWDEN'S EXPERIENCED ENGINEERS AND SITE SPECIALISTS CAN PROVIDE A COMPLETE ADVISORY SERVICE.

### HOWDEN KNOW-HOW

#### UPGRADING AIR PREHEATERS TO THE LATEST TECHNOLOGY STANDARDS BRINGS A WIDE RANGE OF BENEFITS.

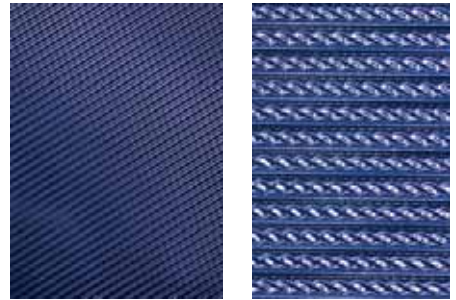
- It reduces the power demands of the draught fan, and thus raises the saleable power output.
- If the operating conditions have changed, replacement elements can improve overall performance significantly.
- It helps to eliminate the temperature dilution effect of air leakage, and so helps reduce corrosion downstream of the air preheater.
- By reducing leakage it makes more air available at the coal mills, ensuring an adequate supply of pulverised fuel to the burners – especially when the coal is wet – and compensating for shortfalls in output.
- Reduced leakage also lessens the flow through the forced draught and induced draught fans, and thus eliminates the output shortfall that would be caused by overloading the fans.
- A routine cleaning of the elements with highly efficient sootblowers will ensure a steady heat transfer and minimise pressure drop in the plant system.
- If operating condition has changed then replacement elements can improve overall performance significantly.

Upgrading or enhancing an air preheater is usually one of the most cost-effective ways of improving boiler performance. Dramatic results can be achieved by either increasing thermal performance or reducing leakage. Before retrofitting FGD plant downstream of the boiler, it is always worth investigating air preheater leakage, which can create unnecessary

demands elsewhere in the system. Improving the air preheater sealing system can actually reduce the size of the FGD plant, with obvious cost savings.

In many cases, heat recovery can be increased by installing higher performance elements, or increasing their overall depth, or both.

## AIR PREHEATER RETROFIT AND ENHANCEMENT



Selecting from our broad range of profiles, we can supply direct replacements for all of the element types commonly used in air preheaters, regardless of make. In many cases alternative profiles or arrangements can improve performance significantly, particularly if the operating conditions have been changed since the original elements were specified. Improving the use of space within the rotor can also make significant contributions to overall boiler efficiency.

In several designs of air preheater, leakage can significantly increase over time. Known as 'leakage drift', this can impair boiler operation in several ways. It can increase the fan's power demands, raise velocities and thus reduce effectiveness in the precipitators, reduce the flow of hot air to the mills or greatly diminish the operational margins of the induced draught fan. These problems can be vastly reduced, or even eliminated, by fitting the advanced Howden VN sealing system to the air preheater.

Air preheaters on coal and oil fired plants are subject to a degree of corrosion, caused when the dewpoint of either the water or the sulphuric acid is approached. Acid enhanced fouling is dependent on the sulphur content of the fuel and the amount of  $SO_2$  to  $SO_3$  conversion in the boiler and FGD plant. Corrosion can be minimised by the use of a cold end layer of higher grade steel or an enamel coating. We have sophisticated software that can calculate the cold end temperature for each case, enabling us to determine the most economic choice of higher-cost material and the precise depth of it required.

To maintain the optimum performance of air preheaters it is vital to ensure that the elements are routinely and effectively cleaned. Failure to do so will quickly lead to fouling, an increase in pressure drop and a reduction in heat transfer. We supply a wide range of highly efficient sootblowers, which combine steam or air blowing with high and low pressure water washing as appropriate.

**CORROSION CAN BE MINIMISED BY THE USE OF A COLD END LAYER OF HIGHER GRADE STEEL OR AN ENAMEL COATING**