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This equipment has been used very successfully for the last 30 years in the mining-related industry as well as the steel, pulp and paper, sugar, power generation, petrochemical, general industrial, and water sectors. The company has a reputation for supplying safe, reliable and sustainable solutions to process problems, resulting in minimum downtime and maximum productivity.

OMSA has just relaunched itself with a streamlined, more customer-centred approach to its business. It has expanded its supplier base, geographical footprint and staff complement. The company is now well positioned to take advantage of the upturn in economic conditions, thus enabling it to expand further into its target markets.

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Comment

The humble heat exchanger and global warming

Following on from the email scandals from the East Anglia Climate Research Unit and the debacle in Copenhagen on Climate Change, a raging debate is taking place in the scientific and non-scientific world: those on the global warming side are busy saying the emails were deliberately leaked to undermine the good work by interest groups within the energy industries; those who have always doubted what they perceive as the alarmist message from the Intergovernmental Panel on Climate Change, say that the message from those 'Climategate' messages cannot be ignored. So far, it looks like the two sides are polarized and one cannot see how a middle ground can be achieved soon. It seems science has been politicized and interest groups have taken over.

However, certain facts are clear: as we generate more electricity to power cities, TVs and computers and industry, we alter the landscape. As we develop the industries to produce the cars and other products for human needs, there is an increase in concentrations of greenhouse effects. Big cities which are an inevitability with modernization, mean more people in concentrated areas and thus more waste, pollution and landfill. Therefore serious research into ways to mitigate these challenges facing modern beings is needed. The US House of Representatives has passed a law mandating an 83% reduction in greenhouse emissions by 2050. It is most likely that the rest of the world will follow a similar approach.

So, what can the humble heat exchanger contribute to this complex and rather emotive issue?

Heat exchangers are already widely used in the environmental pollution mitigation: from suppressing the generation and reduction of VOC to indirect methods like the use of less fossil fuel by developing more efficient exchangers.

VOCs are generated from many manufacturing processes like glass fibre curing, pulp and paper, petrochemical processes, sewage plants and food industries. Amongst the many ways to mitigate against VOCs like biofiltration, adsorption, absorption, high temperature oxidation and condensation, the heat exchanger has an important part to

play. For example in high temperature oxidation (thermal oxidation and catalytic oxidation), heat exchangers are used to preheat the polluted air, thus reducing the amount of fuel gas required. Thus a complex heat generation and recovery process is developed using conventional exchangers and regenerative heat exchangers. Because these exchangers are operating at high temperatures, unique challenges around slagging, fouling and materials need to be overcome.

In most modern wastewater plants, anaerobic digestion is the method of choice for sludge treatment. The sludge is very variable and contains solids and fibres. The sludge needs to be treated at a certain temperature in order to aid efficient biological treatment. The use of compact heat exchangers as preheaters has led to smaller spiral heaters which are used as sludge heaters by providing a close or almost exact temperature to aid sludge stabilization.

The pulp and paper industry also faces a lot of challenges with VOCs. Evaporation is one of the ways used to mitigate against this problem. Because of the complexity of fluids involved, a lot of research is required to develop more efficient evaporators, eg, heat transfer coefficients correlations representing the particular components, which will ultimately lead to less usage of steam.

From the process industry to the automobile with the compact radiator, modern aircon to the mining industry, the heat exchanger is playing its part in mitigating against greenhouse emissions. The challenge is to solve the current challenges related to this important and omnipresent equipment: developing more compact equipment, overcoming fouling issues due to the complexities of the fluids involved, developing the science that mimics real situations within the unique and specific industries and developing the materials for these very speciality applications.

The list is neverending. It is, however, clear that a lot of R&D work is still required and chemical engineers have an important role to play in solving the challenges of global warming and the heat exchanger contributes towards that!