

AP Technology™

Sustainable Development Pot gas cooling by water vaporisation: a Rio Tinto Alcan patented system



Taking pot gas cooling to the next level

Our patented pot gas cooling by water vaporisation system is intended mainly for seasonal use (typically during summers for smelters in cold climates) or for continuous use when gas temperatures are always over 130°C (typically for smelters operating in hot countries). The system achieves a temperature drop of 25°C to 30°C.

Several well-known methods exist in the aluminium industry for reducing gas treatment centre (GTC) inlet temperatures.

Fact sheet

Pot gas cooling by water vaporisation

The principle behind our unique system

Lances spray finely atomized water droplets in the ductwork. The vaporisation of water cools down the hot gases. Monitoring the size of the water droplets is crucial to ensure that the water entering the GTC is fully vaporised to avoid corrosion hazards.

Today this system has been implemented in three smelters: Tomago Aluminium (Australia-2003), Saint-Jean-de-Maurienne (France-2006) and Sohar Aluminium (Oman-2011).

Positive results have been achieved at all three sites.

Specific concerns related to the technology such as scale build-up, polyester fabric hydrolysis and corrosion risks are now well under control.

Summary

Main objective: achieve a pot gas temperature drop of 25°C to 30°C

Provide same GTC stack emission level while reducing CAPEX, in comparison to other available technologies such as air dilution and heat exchanger

Alternatively, reduce the GTC stack emission level owing to the lower gas temperature

Cost savings

CAPEX: minimum 50% saving compared to other available technologies

OPEX: similar to or lower than other available technologies

Applies to creeping and greenfield projects featuring AP Technology™ and other prebaked technologies using gas dry scrubbing treatment.

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