

Case History

Xstrata Nickel's mining operations include five mines and processing facilities in Ontario and Québec, Canada. As the world's fourth largest nickel producer, *Xstrata Nickel* (formerly *Falconbridge Ltd.*) manages an annual production of more than 110,000 tonnes of refined nickel from its fully-integrated operations. It is also one of the world's largest recyclers and processors of nickel and cobalt-bearing materials.

Xstrata Nickel had previously used a variety of air-conditioning, media cell carbon systems for the removal of sulfur dioxide at sites throughout their smelter. Due to the high velocity of the air streams in these air-conditioning units and the limited usage of carbon media, the actual removal of SO₂ was minimal – both cool and warm air contained high concentrations of SO₂.

Filter Innovations Inc. (FII) discussed this application with the engineering department at *Xstrata Nickel* and determined that a deep bed scrubbing unit was required to completely remove the SO₂ from the air stream. It was further determined that an integrated HVAC system would be required to fully condition the air stream feeding three control booths in the Converting Aisle, a lunchroom, a conference room and a number of field offices. The HVAC system, connected to the carbon scrubber, would also regulate air temperature year-round.

Xstrata chose *Leipciger, Kaminker, Mitelman & Partners (LKM) Consulting Engineers*, based in Sudbury, Ontario to provide the necessary bid documentation for the required air handling system. The tender documentation supplied by *LKM* was sent to a number of preferred vendors, including *Filter Innovations*.

FII was approved as the preferred vendor for the carbon scrubbing unit and *Engineered Air*, located in Ottawa, Ontario was chosen to provide the air-conditioning component.

The *Xstrata* project was titled “Smelter Converter Aisle HVAC System Improvements” and included the supply, delivery, start-up and commissioning of one built-up air-handling unit and condensing unit for the Smelter HVAC upgrade.



Air Treatment Using *FII* Scrubber System

The selected *FII* carbon scrubbing unit was designed (as per *LKM's* and *Xstrata's* requirements) to handle 7600 cfm of SO₂ laden air. Concentrations varied from few to very many parts per million SO₂. The unit consisted of three, 12-inch deep media chambers for the required media depth of 36 inches. The multiple bed chambers (3 x 12-inch) provide flexibility for future use should contaminants requiring different filtration media enter the air stream. Single bed media scrubbers are not suitable for these possible unforeseen problems.

FII chose to build the scrubber unit out of 11-gauge epoxy-coated mild steel, since high humidity was not a factor. If humidity were an issue, stainless steel construction would be required in order to prevent internal corrosion. Eleven-gauge steel is used in *FII* media vessels in order to resist buckling.

The scrubber unit was also designed with media top-loading hatches for quick carbon fill-up and vacuum unloaders for rapid carbon removal. Differential pressure gauges were added for monitoring airflow through both the multiple media chambers and two pre-filters housed in “glidepack” high-pressure door enclosures.

In order to ensure satisfactory SO₂ levels were achieved, an SO₂ sensor was added to the scrubber. Note that the scrubber and the HVAC unit were provided with 25% outside make-up air and 75% indoor plant air.

Results and Advantages

The Filter Innovations 7600 Scrubber / HVAC system was first used in early January of 2007 and has performed exceedingly well since then. The SO₂ sensor has yet to register above 0 ppm SO₂ at the outlet. There is virtually no maintenance required on the scrubber side of the system beyond pressure monitoring and particle filter change-outs from time to time.

About Filter Innovations 1nc.

Filter Innovations, a privately held firm, is a leading provider of treatment solutions for process water, wastewater, ground water, and air in Canada, with additional sites in the US and several countries overseas.

Headquartered in Toronto, Canada, FII has had consistent growth and increased annual sales with systems and equipment supplied for over 1,000 sites and with over 500 clients.

For more information, please contact Filter Innovations at 416-490-7848, email us at inquiries@filterinnovations.com or visit our website at www.filterinnovaitons.com.