

ATF-06-05—Fluoride Emissions Management

Project

Fluoride is part of the aluminium smelting process with alumina being dissolved in a bath of molten cryolite (sodium aluminium fluoride) to facilitate the electrolysis process. Fluoride emissions (as gases and particulates) remain of high environmental concern for the aluminium smelting sector.

Depending on the local conditions, fluorides could have a serious environmental impact on the local flora and fauna. Fluorides accumulate in vegetation and can cause damage to coniferous trees. They also accumulate in the teeth and bones of ruminants eating fluoride-contaminated forage. Plants with modern control systems to remove and recycle the fluorides do not generate local concerns. Optimum fume collection from the electrolytic cells, coupled with specific workplace-related training of employees, has led to further improvement.

The management of fluoride emissions is critical to ensure that environmental impacts are minimized or eliminated. This project will identify practical mechanisms to reduce fluoride emissions for existing smelter operations and disseminate information to enable implementation to achieve reductions in fluoride emissions.

Project objectives

To provide smelter operators with information on their operation's fluoride emissions performance as it relates to the global average.

To implement best practice and technology to reduce fluoride emissions across all primary aluminium smelters in the Partnership.

Performance indicators

All Partner countries are trained in the collection and reporting of the required data.

Each Partner achieves the IAI median benchmark for fluoride emission performance for each technology type.

Ongoing PFC emissions performance benchmarks to be reassessed based on global benchmarks.

Milestones

2006–07 An international organization (to be determined) with expertise in data collection and analysis to collect data and report current status of fluoride emissions for aluminium smelters from all Partner countries.

The international data collection organization to provide smelter-specific reporting which benchmarks against global average.

Concurrently, identify, collect and collate information on fluoride emissions reduction measures and opportunities that have been implemented by smelters in Partner countries and international experience.

2007–08 Disseminate the collated information to all Partner countries. The information dissemination process could be supplemented by industry presentations/workshops and/or site visits to increase industry awareness of current opportunities/best practice for reducing fluoride emissions.

2008–09 Establish an expert review team from Partner countries to review a small number of representative, less efficient facilities to identify potential opportunities for cost-effective and practical fluoride emissions improvements as the basis for preparation of case studies to be shared with all Partner countries/facilities.

Individual Partner countries/facilities (possibly with expert assistance from other Partner countries) to implement cost-effective fluoride emissions management measures. (Note, while Partner countries would work collaboratively to identify projects, decisions on implementation would continue to be the responsibility of individual companies and facilities.)

2009–10 Prepare, collate and disseminate case studies and lessons learned on implementation of projects.

Collect national-level data on the fluoride emissions of production facilities in Partner countries and compare to the original data collected at the commencement of the project.

Resources

An international organization (to be determined) with expertise in data collection and analysis to collect and analyze fluoride emission data.

Government agencies and industry associations (where these exist) distribute aggregated and benchmark data and information.

Expert review group for assessment of a small number of smelters, which would include the preparation of case studies to be shared with all Partner countries/facilities.

Presentations, workshops and site meetings hosted by participating companies and supported by industry experts (e.g. consultants, researchers) to disseminate aggregate data results and analysis of measures.

Project identification, development, financing and implementation by companies supported by internal and external resources (project and financing consultants, in-house staff)

Participation

Australia, China and the United States.