HFC-23 From HCFC-22 Manufacturing

Introduction

Trifluoromethane (HFC-23) is a by-product formed during the manufacture of difluorochloromethane (HCFC-22) as a result of over-fluorination. The formation of HFC-23 is dependant upon the process conditions used in the manufacturing process and varies between 1.5 to 4.0 % of the production of HCFC-22. There are 10 manufacturing plants for HCFC-22 in the EU. The capacity for the production of HCFC-22 in the EU is estimated to be 184,000 metric tonnes; the reported levels of production are very close to this capacity. It is estimated that levels of HCFC-22 production will decrease by 30% by the year 2010 under the EU Regulation 2037/2000 on Substances that Deplete the Ozone Layer. The total potential emissions of HFC-23 depending upon the rate of formation in the individual manufacturing plants is 2,760 to 7,340 tonnes per annum (or 32.3 to 85.9 MMT CO2 equivalent).

Actions Taken

Six of the ten HCFC-22 manufacturing facilities have installed thermal destruction facilities as of mid-2000. These facilities make up approximately 80% of EU HCFC-22 production. Manufacturing plants in Spain (2), UK (1) and Greece (1) remain without such facilities. The typical costs of such units are Euro 3 million to destroy 200 metric tonnes of HFC-23 per year plus Euro 200,000/ annum operating costs. Emissions in the year 2000 have reduced from 3,150 metric tonnes in 1995 to between 760 and 2,025 metric tonnes, depending upon the rates of HFC-23 formation in the respective HCFC-22 manufacturing facilities.

Proposed Recommendations based on discussions at ECCP Industrial Products meeting

1. At an EU level

- Further legislation at an EU level would not achieve further reductions in emissions and additional regulation is not required.
- Individual HCFC-22 manufacturing facilities should be treated on a country by country basis in a way that no competitive disadvantages will occur.
- Voluntary data collection of actual HFC-23 emissions and annual reporting should be agreed.
- An estimation of the impact of ‘down-time’ of thermal oxidation units on the emissions of HFC-23 should be undertaken on a voluntary basis.

2. At a National Level

- Use the IPPC Directive, where appropriate, to encourage the adoption of thermal destruction technologies or other appropriate and practicable technologies at the remaining facilities.
- Encourage further reductions where practicable and cost-effective.