

Non-CO₂ Greenhouse Gases: High-GWP Gases

Source/Sectors: Substitution of ODS/Solvent Uses

Technology: Aqueous cleaning (C.1.3.2)

Description of the Technology:

Aqueous cleaning processes use water and detergents as a solvent. A hydrocarbon solvent combines with a surfactant to remove contaminants. The process consists of four stages: washing, rinsing, drying, and wastewater disposal (IEA, 2003).

Effectiveness: This technology can successfully displace HFCs and PFCs usage in some solvent applications.

Implementability: Good

Reliability: Some technical limitations, such as substrate corrosion, inadequate performance for applications with complex parts, still remain (USEPA, 2006b).

Maturity: Aqueous cleaning technologies have been used for over 25 years in developed countries (UNEP, 1999). Further market penetration is not expected in the United States, where the market prefers fluorinated solvents such as HFCs and HFEs (USEPA, 2006b).

Environmental Benefits: High-GWP gases emission reduction

Cost Effectiveness:

Technology	Lifetime (yrs)	MP (%)	RE (%)	TA (%)	Capital cost	Annual cost	Benefits
Aqueous cleaning ¹	10	5	100	90 - 100	\$40.00	\$0.00	\$0.00

Note: MP: market penetration; RE: reduction efficiency; TA: technical applicability; costs are in year 2000 US\$/MT_{CO₂-Eq.}
1: USEPA (2001), IEA (2003), & USEPA (2004)

Industry Acceptance Level: Many electronics and metal cleaning sectors worldwide have already adopted this technology (IEA, 2003).

Limitations: There is an uncertainty in cost performance for the wastewater treatment processes as well as energy consumption (USEPA, 2001).

Sources of Information:

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