

Progress Report: EPA's Magnesium Industry Partnership

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SF₆ and the Environment:

Emission Reduction Strategies

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Organization

- Who are EPA's Partners?
- 2001 Results
- Overview of Emission Reduction Technologies
- Current Initiatives and Next Steps



Welcome New Partners!

- Consolidated Foundries - Pomona
- Xstrata Magnesium



17 Partner Companies

- Acme Die Casting
- Chicago White Metal Casting
- Consolidated Foundries - Pomona
- CONTECH Metal Forge Division of SPX Corporation
- Del Mar Die Casting
- Diversified Diemakers
- Hyatt Die Cast & Engineering Corporation
- Lunt Manufacturing
- Magnesium Aluminum Corporation
- U.S. Magnesium
- Magnesium Products of America
- Northern Diecast
- Northwest Alloys*
- Product Technologies
- Spartan Light Metal Products
- Xstrata Magnesium
- Wyman-Gordon Investment Castings



2001 Partnership Results

■ Total Emissions (kg SF₆)

- 1999 = 129,500

- 2000 = 112,800

- 2001 = 78,300 (40% reduction from '99)

■ Partners' Usage Rates (kg SF₆/tonne Mg)

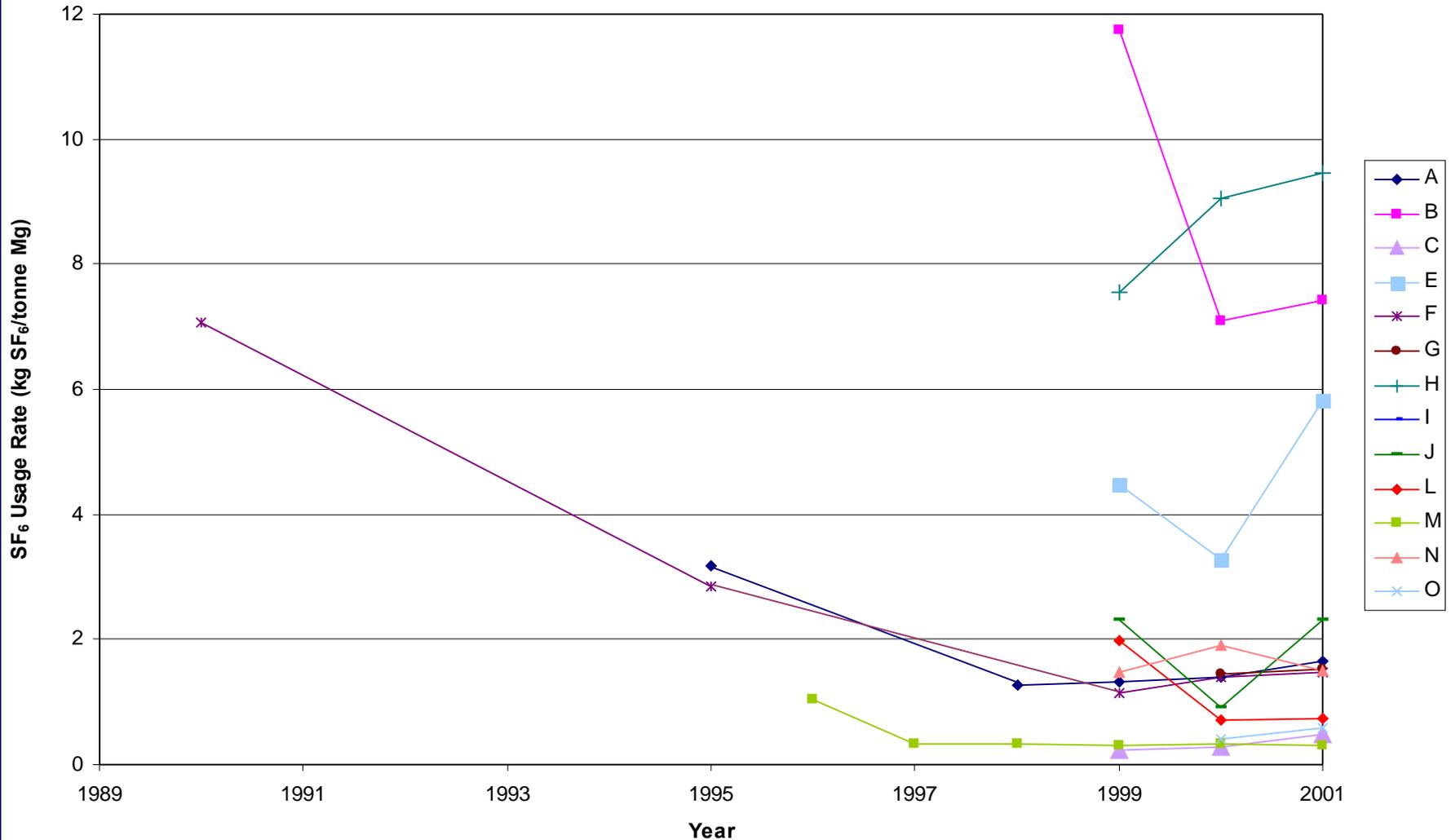
- range = 0.5 - 9.5

- Average weighted (die casting) = 0.8

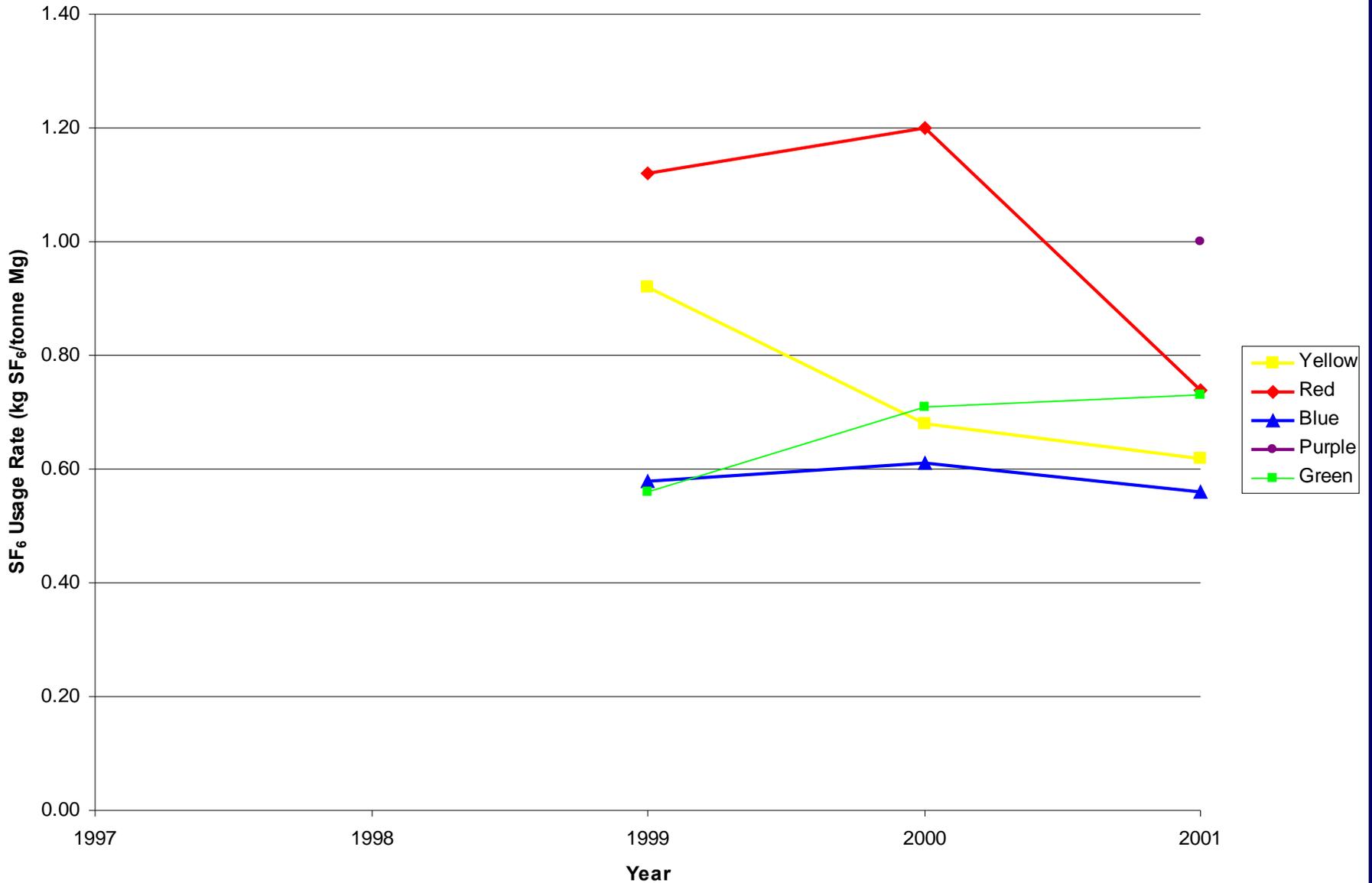


Partnership's SF₆ Gas Usage Rates - Die Casting

Partnership SF₆ Usage Rates - Die Casting



U.S. Partners/International SF₆ Gas Usage Rates - Primary Production



Pollution Prevention (P²) Approach

- Process Optimizations
 - Gas handling
 - Leak detection
- Alternative chemicals
- Capture/Recycle
- Abatement



Equipment Optimizations

- Well sealed furnace lids
- Uniform gas distribution system
- Flexible/leak resistant delivery pipes
- Upgraded air dryer
- Dual/triple cover gas flow rate control
 - Idle
 - Active
 - Ingot loading/drossing



Gas Management and Leak Detection

- Advanced leak detection technology
- Central cover gas blending
- Assure appropriate concentration
- Limit access to flow controls
- Designate SF₆ “Champion”



Alternative Cover Gases

■ IMA Study

- Fluorinated ketones

- HFCs

- SO_2F_2

- SO_2

- BF_3

- Equipment manufacturer's blend

 - CO_2 , "oxidizing gas", Argon, Xenon



SF₆ Capture and Recycle

- Magcorp/Air Liquide
- Solvay Fluor & Derivate
- “Used” SF₆ from electric utilities?

Industry Trends

- China dominating primary production
 - Environmental impact?
 - Increasing SF₆ emissions?
- Australia to enter market
 - Primary (and casting?)
- Global efforts to protect climate
 - Encourage lighter vehicle production
 - Mg as “climate friendly” material



Current Activities & Next Steps

- Support IMA SF₆ substitutes study and implementation
- Measure SF₆/Mg reaction products
 - GHG reporting protocol for alternative gases
- Set emission reduction goal
 - 2005 and 2010
 - **Eliminate** SF₆ emissions by 2010
 - White House industry sector commitments

