

GasVue and the Magnesium Industry: Advanced SF₆ Leak Detection

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The SF₆ Problem

- EPA regards SF₆ as a serious greenhouse gas
- The magnesium industry uses significant amounts of SF₆
- EPA/industry partnerships
 - Generic emission plan
 - Voluntary compliance
- SF₆ is *EXPENSIVE*

The Solutions

- **Use of SF₆ recycling equipment**
- **Implement leak detection and repair programs**

Background

- **Backscatter/absorption gas imaging (BAGI)**
- **A real-time gas plume visualization technique**
 - Developed for the US Navy
 - Works *FANTASTIC* for SF₆

Background (continued)

- **LIS has exclusive license to BAGI technology**
- **Marketed by LIS as GasVue[®]**
- **Current applications**
 - Location of fugitive emissions
 - Assembly-line leak testing

GasVue[®]

- **What is it?**
 - A qualitative 3-dimensional vapor detection scheme which makes normally invisible gases “visible”

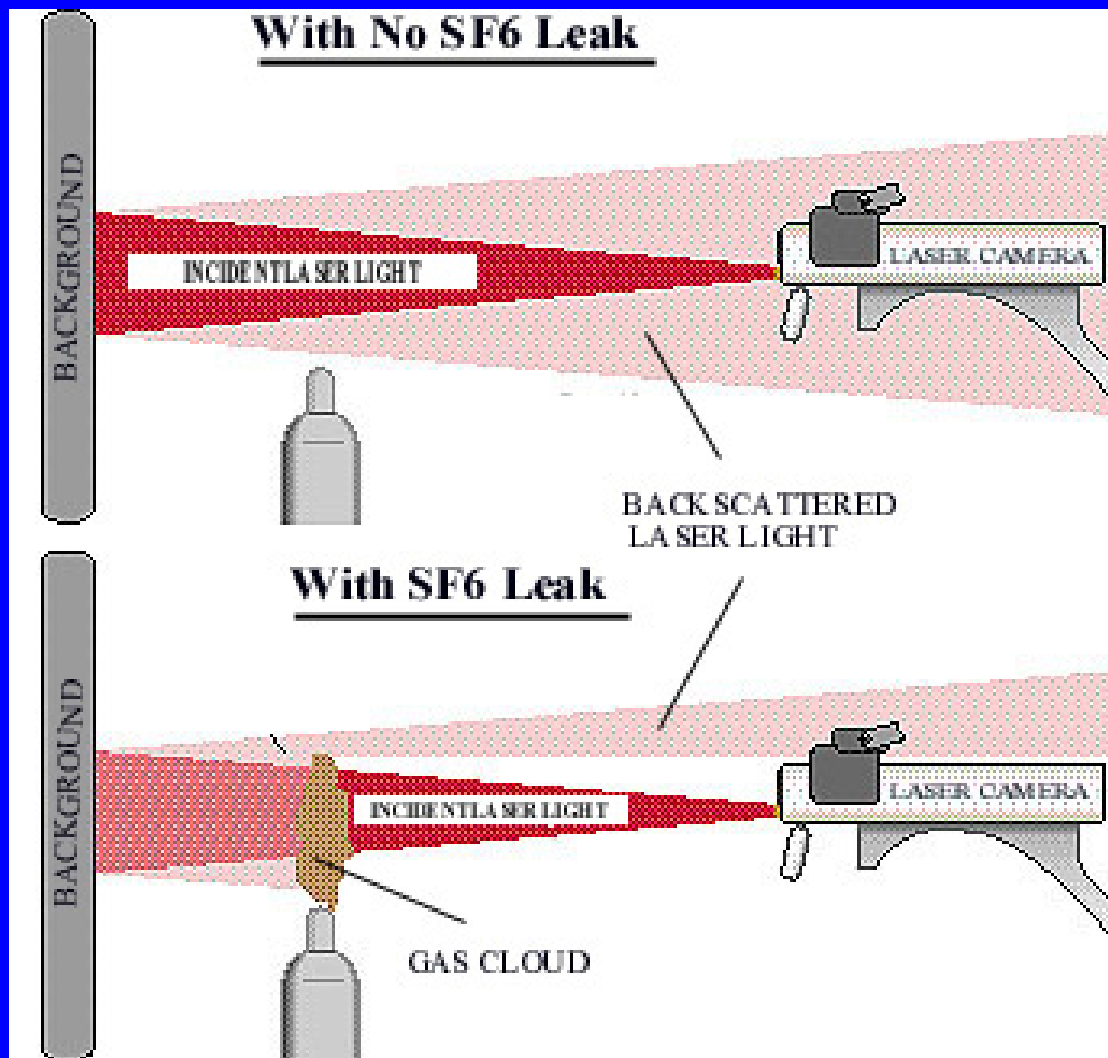
GasVue Leak Visualization Demonstration



GasVue

- **How does it work?**
- **Formation of a video image by the appropriate laser light**
 - (1) Terrain image produced by backscattered laser light
 - (2) Gas plume image produced by absorbed laser light
- **Result: both terrain & gas plume visible on the TV monitor**

GasVue Fundamentals



GasVue Operational Constraints

- **Must operate in an atmospheric transmission window**
- **Must have a scattering background behind the gas plume**
- **Gas must absorb the laser light**

Video Segments

- **Electrical substation SF₆ leaks (EPRI)**
- **Natural gas leaks (DOE/GRI)**
- **VOC leaks (EPA/API)**

The GasVue TG-20 (water-cooled)



The GasVue TG-30 (air-cooled)



GasVue & the Magnesium Industry

- **Rapid leak inspection of gas storage & handling systems**
- **In-house vs service?**

Summary

- **Background information about GasVue technology**
- **Description of technology fundamentals**
- **Videos of GasVue applications**
- **Use in the magnesium industry?**