

FLAME DETECTION FOR SILANE & OTHER NON-HYDROCARBON FIRES

**Ernesto Vega Janica – Jonathan Eisenberg
Rolf Jensen & Associates
Email: evega@rjagroup.com**

Abstract:

The intent of this research is to analyze extremely volatile and toxic gas which can spontaneously ignite on contact with air without any external ignition source, review some national e international Codes and Standards; determine the applicability of design concepts and, their implementation in real case scenario.

During this presentation we will review some simple questions such us: What is Silane? and Why is so important on this date and age? Then, we will move to more interesting questions related to our fire protection industry, for example: What are the differences between UV and IR detectors? How should we perform our risk analysis and how to integrate our recommendation with national e international codes and standards?

Key Words:

Silane (SiH₄), Disilane, TSA (Trisilylamine - H₉N₃Si₃), MCS (Monochlorosilane - SiH₃Cl), Anisole Solvent (C₇H₈O) and Ammonia (NH₃) fire alarm detection, flame light spectrum, UV/IR/video flame detectors, Silane handling and storage, ANSI/CGA-G-13.

Introduction:

Pyrophoric gases and liquefied gases are a real challenge when protecting people and Client's manufacturing plants; the potential fires and their impact could be substantial in a matter of seconds. Therefore, early and accurate fire detection is key for notification and evacuation of occupants, as well as, for mitigation and fire suppression activities.

Our research is based on technical provisions of NFPA 318 and ANSI/CGA Standards as approved methods for the protection of semiconductor fabrication facilities for bulk silane storage and handling. A real case scenario is examined under Code regulations and possible detection system layouts are analyzed. Our lessons learned are also discussed in plenum.

Reference & Applicable Codes:

- ✓ 2006 ANSI/CGA-G-13, Storage and Handling of Silane and Silane Mixtures
- ✓ 2012 NFPA 318, Standard for the Protection of Semiconductor Fabrication Facilities for bulk silane storage
- ✓ 2009 International Building Code (IBC)
- ✓ 2009 International Fire Code (IFC)