ULTIMA-Sorb™ Dry Abatement Media for Arsine and Phosphine

20% to 50% Cost of Ownership Savings

Overview

ULTIMA-Sorb™ Dry Abatement Media is a new and improved cost saving solution for hydride abatement serving the Compound Semiconductor Industry. Developed through a joint alliance between MATHESON and ATMI, Inc. (ATMI), ULTIMA-Sorb™ employs state of the art technology to abate MOCVD process gases, especially arsine and phosphine. ULTIMA-Sorb™ dry abatement media gives the end user the highest capacity available on the market today resulting in a 20% to 50% reduction in abatement cost of ownership.

Description

Expertise in abatement material technology by Matheson and ATMI resulted in the development of the highest capacities and lowest heat generation dry abatement media when compared to other conventional dry absorbent technologies such as copper oxide and activated carbon. ULTIMA-Sorb™ combines two special materials to optimize the scrubbing capacity and efficiency, while reducing heat generation of the system. Together, these materials are designed to chemically remove hydride gases at room temperature without intermittent oxidation steps, as well as, delivering 3 to 5 times larger capacity than conventional dry abatement media.

Recent demand for higher flow applications requiring AsH_3 and PH_3 have caused excessive heat generation problems with the hydrogen carrier gas using conventional copper oxide technology. ULTIMA-Sorb™ is less reactive to hydrogen eliminating the issue of excessive heat generation.

Compare the ULTIMA-Sorb™ Dry Abatement Media to any other dry scrubber media and you will see the rewards. The cost of ownership benefits of ULTIMA-Sorb™ arise from greater capacity for hydride adsorption without any regeneration, plus reduced disposal charges. These attributes improve the cost of ownership through reduced labor, tool up time and disposal costs.

Product Features and Benefits

Reduces Cost of Ownership by approximately 20% TO 50% through:

- 3 to 5x greater capacity of carbon-based systems
  - Results vary with linear velocity and hydride concentration
  - Higher equipment uptime and stable operation
  - Lower maintenance and disposal costs
- No regeneration requirement during processing
  - Only needed for final decommissioning
- Higher compatibility to hydrogen carrier gas and lower heat generation when compared to conventional copper oxide-based systems
  - Safer system to operate
- Direct drop in replacement for competing abatement media (carbon / copper oxide / copper carbonate)
  - No equipment modifications are required
- Disposable DOT canisters are available in 37 gallon downflow configuration at this time
  - Will help eliminate on-site labor requirements for filling and disposal
- Abates all metal organics efficiently
  - Complete abatement operation

Comparison of ULTIMA-Sorb™ Capacity with other Abatement Materials

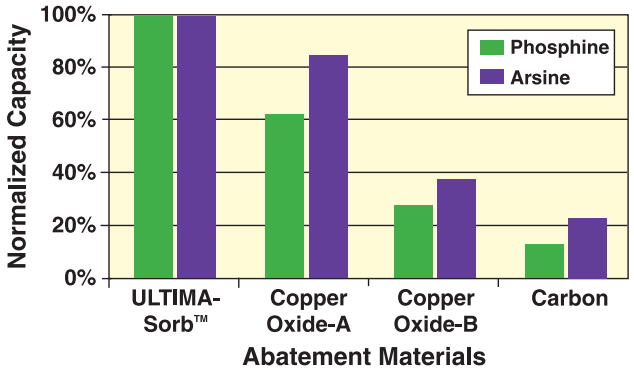

Figure 1: ULTIMA-Sorb™ delivers much higher capacity for PH_3 and AsH_3 than conventional copper oxide-based abatement material and activated carbon-based material.

MATHESON
The Gas Professionals

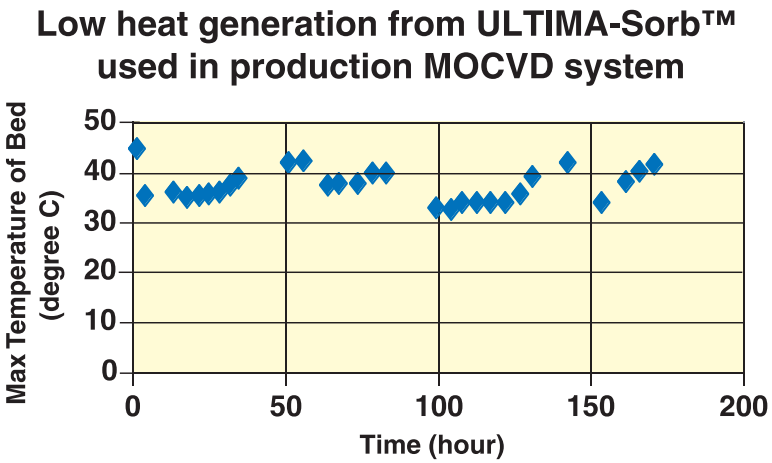

Figure 2: Plots for Maximum temperatures of ULTIMA-Sorb™ bed measured by thermocouples inserted into an abatement canister when approximately 0.9% of AsH_3 at 1.2 cm/sec diluted with H_2 was introduced into a production MOCVD reactor.

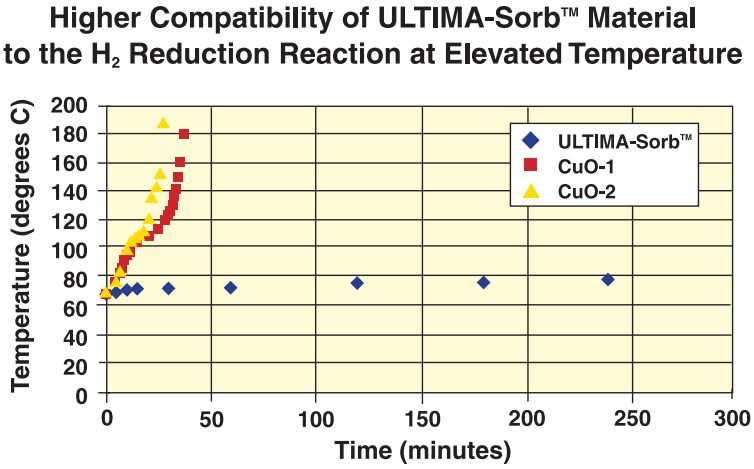

Figure 3: Conventional copper oxide abatement materials (CuO-1 and CuO-2) start run-away reaction by H_2 at 70 °C while ULTIMA-Sorb™ is stable at the same condition.

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