

SULFUR MAGNET[®]

The Ultimate Sulfur & NO_x Removal Media for Ultra-Pure H₂ & Air



What Is the SULFUR MAGNET[®]?

The SULFUR MAGNET[®] is a revolutionary filter media developed by Standard H₂, Inc. to eliminate sulfur compounds and oxides of nitrogen (NO_x) from gases—most notably hydrogen and bottled reagent gases. The media inside the H₂ FINAL FILTER[®] plays a vital role in protecting sensitive equipment like Proton Exchange Membrane (PEM) fuel cells and Solid Oxide Fuel Cells (SOFC) ensuring high efficiency and long service life.

Key Benefits: Capacity and Tenacity

- High Capacity: Absorbs up to 55.4% of its weight in sulfur, outperforming all other tenacious sorbents on the market
- Unmatched Purification: Reduces hydrogen sulfide (H₂S) to below 0.2 ppb, the limit of detection
- Multifunctional Protection:
 - Removes NO_x to below 200 ppt
 - Broad spectrum antimicrobial
 - Eliminates particles >2 microns
 - Ideal for hydrogen, natural gas, air, reagent gases, and more

Applications

- PEM Fuel Cells – Prevents catalyst poisoning from sulfur and NO_x
- SOFC Fuel Cells – Prevents voltage degradation
- Hydrogen Electrolysis and SMR – Ensures purity for hydrogen production
- Semiconductor Manufacturing – Protects critical instruments from contamination
- Ideal for confined space & clean room air purification, removing odors and pathogens
- Gas Chromatography (GC) – Provides point-of-use ultra-clean gases
- Laboratory & Industrial Systems – Delivers high-purity gases

Safe, Sustainable, and Compliant

- Not water soluble
- 100% VOC-free and non-flammable
- DOT unrestricted – Safe for transport as virgin or spent media
- Eco-friendly – Regenerable, recyclable, and landfill-disposal permitted

Integration and Flexibility

The SULFUR MAGNET[®] is available:

- In bulk in grain sizes as required
- Pre-packaged in H₂ FINAL FILTER[®] Mini-HT and other systems as required
- Housed in 316L stainless steel with compression ends (6mm, 1/4", 1/8" as standard, with other sizes by request)



Performance-Backed Purity

- ✓ 3rd-party tested
- ✓ <0.2 ppb total sulfur
- ✓ <0.2 ppb total NO_x
- ✓ Improves ROI by reducing maintenance, increasing lifespan, and ensuring uninterrupted performance

Contact Us

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Desulfurization is Critical to Improving Performance, Compliance, and Efficiency

Desulfurization—the removal of sulfur compounds from gases and liquids—is a critical process across numerous industries due to its far-reaching impact on performance, compliance, environmental health, and economic efficiency. Below is a detailed overview of its importance, segmented by key sectors:

Fuel Cell and Hydrogen Economy

The Challenge: PEM (Proton Exchange Membrane) fuel cells, widely used in hydrogen vehicles and energy systems, are extremely sensitive to sulfur. Even trace amounts of H₂S poison platinum group metal catalysts, drastically reducing performance and lifespan.

The Role of Desulfurization:

- Protects fuel cell catalysts from irreversible damage
- Enables longer operational life and improved ROI
- Ensures hydrogen purity down to <200 ppt of H₂S, exceeding ISO standards
- Supports clean energy infrastructure (e.g., electrolysis, SMR hydrogen)

Could eliminate the break-in period of SOFC

Industrial and Manufacturing Applications

The Challenge: Sulfur impurities in industrial gases (e.g., hydrogen, natural gas, nitrogen, air, etc.) can corrode pipelines, foul sensitive instrumentation, and compromise chemical reactions in semiconductor fabrication and pharmaceutical manufacturing.

The Role of Desulfurization:

- Prevents equipment degradation
- Ensures process stability and product quality
- Supports clean room and ultra-pure gas requirements (especially in electronics, medical, and optics industries)

Transportation and Mobility

The Challenge: Hydrogen-powered vehicles and internal combustion engines suffer from emissions, corrosion, and reduced fuel efficiency due to sulfur content in fuels.

The Role of Desulfurization:

- Enables zero-emission fuel cell vehicles to run efficiently
- Improves the Return on Investment
- Reduces engine wear and exhaust emissions
- Enhances overall fuel combustion quality

Environmental and Regulatory Compliance

The Challenge: Sulfur oxides (SO_x) and related compounds are regulated pollutants due to their role in acid rain, respiratory illness, and ecosystem damage. Nitrogen oxides (NO_x) and volatile organic compounds (VOCs) are also tightly controlled.

Desulfurization and the Environment:

- Helps companies comply with EPA, CARB, and international emissions standards
- Reduces acid rain precursors
- Contributes to ESG and sustainability goals

Laboratory and Analytical Settings

Traces of sulfur can interfere with analytical accuracy lowering the limit of detection in sensitive instruments like gas chromatographs, spectrometers, and other lab equipment.

The Role of Desulfurization:

- Improves the limit of detection
- Reduces instrument fouling and recalibration frequency
- Maintains precision and reproducibility in high-purity testing environments

Desulfurization is no longer optional—it's essential.

Whether you're purifying hydrogen for a zero-emission vehicle, protecting semiconductor yields, or complying with strict environmental standards, removing sulfur and NO_x are central to optimizing performance, safeguarding assets, and achieving regulatory and sustainability targets.



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