



TOXIC GAS DETECTION IN HEALTH STERILIZATION APPLICATIONS

WILL BOWDEN- SALES ENGINEER-
INTERSCAN CORPORATION





Easy to use, easy to own specialized gas detection instruments.

SPECIFIC CHALLENGES WITHIN HEALTH STERILIZATION OPERATIONS

ETHYLENE OXIDE

TOXICITY: HEALTH RISKS INCLUDE SKIN/EYE IRRITATION, DIZZINESS, RESPIRATORY ISSUES, AND CANCER.

ENVIRONMENTAL IMPACT: CONTRIBUTES TO POLLUTION. HIGHLY REGULATED

REGULATORY CHALLENGES: COMPLIANCE REQUIRES COSTLY SAFETY MEASURES.

HYDROGEN PEROXIDE

RESIDUE CONCERNS: MAY LEAVE BEHIND RESIDUES ON EQUIPMENT.

COMPATIBILITY: LIMITED SUITABILITY WITH CERTAIN MATERIALS.

REGULATORY COMPLIANCE: REQUIRES SPECIALIZED EQUIPMENT DUE TO STRICT REGULATIONS.

PERACETIC ACID

CORROSIVENESS: CAN CORRODE SOME MATERIALS, RESTRICTING ITS USE.

ODOR AND IRRITATION: STRONG ODOR AND POTENTIAL RESPIRATORY SYSTEM, SKIN, AND EYE IRRITATION.

REGULATORY COMPLIANCE: REQUIRES RIGOROUS MONITORING AND CONTROL MEASURES.





- Graduated Clarion University of Pennsylvania with a BS in Biology
- Veteran of the US Army Medical Corp., serving overseas and in the US
- Licensed Medical Laboratory Scientist (ASCP) & Clinical Laboratory Scientist (NCA)
- Spent 32 years in the Clinical Laboratory/Automation Field with Beckman Coulter, retiring as Government Sales Director.
- Sales Director for Branch Medical, a Service-Disabled Veteran Owned Small Business that specializes in Medical Diagnostics, Automation, and Cybersecurity since 2022
- Owner & President of Medbrokers LLC since 2017

George G. Meade MLS (ASCP)
Owner
Medbrokers LLC
gmeade@medbrokersllc.com
www.medbrokersllc.com
(412) 607-9193



Case Study #1: Safety AND Productivity in a business setting

Problem: How do we ensure worker safety without delaying EO sterilized shipments?

- Interscan worked with the company's safety personnel, insurance company, and customers to develop a SOP employing portable EO monitoring solutions within their DC's.
- Interscan portable monitors yield real-time results, providing instant feedback to EO workers with minimal impact on TAT.
- Annual Employee EO education & monitor competency audits are a key component and are strictly enforced & documented.
- Result: safer warehouse environment, less employee reluctance to work with EO products, and no decrease in TATs.

Case Study #2: Hydrogen Peroxide Monitoring in SPD

Problem: Why consider H₂O₂ or PAA monitoring if not required by OSHA?

- H₂O₂ has the same PEL (1.0 ppm) as EO and is ten times more dangerous than EO based on an IDLH of 75 ppm v. the IDLH of EO, which is 800 ppm.
- Large Hospital Network in the NE decided to install permanently mounted, Interscan LD09 H₂O₂ monitors after employee was injured by vapors while removing load from Plasma sterilizer.
- Interscan worked with SPD and IH leadership at the Hospital Network to implement a new SOP- utilizing alarm thresholds, real-time results, and continuous air exchanges of the Interscan monitors- to be followed while removing loads.
- Result: Safer SPD workspace and no reported exposures since implementation.



Case Study #3: Gas Monitoring and Beyond!

Problem: How does NASA keep astronauts and their landing & recovery crews safe?

- Upon splash down, spacecraft can emit a dangerous levels of hydrazine, a chemical that has toxic effects on several organ systems and is classified as a possible carcinogen.
- Before recovery can occur safely, NASA employees cautiously approach the spacecraft in Gemini boats, using portable Interscan hydrazine monitors to ensure recovery may proceed safely for all parties.
- Result: live and accurate gas monitoring eliminates the possibility of hydrazine exposure.

Medbrokers LLC is a Veteran-Owned Small Business as certified by the SBA and has been helping customers globally with their gas detection needs since 1996. We feature Interscan Products and offer sales, calibration, repair, training, and consultation services.

Please contact me any time:

George G. Meade, MLS (ASCP)

Owner, Medbrokers LLC

412-607-9193

gmeade@medbrokersllc.com

www.medbrokersllc.com

Delivering Gas Monitoring Solutions since 1996!



RISKS ASSOCIATED WITH GASES

- STERIGENICS \$35 MILLION CIVIL SETTLEMENT FROM 79 CLAIMS FOR LONG TERM HEALTH ISSUES/CANCERS DUE TO EXPOSURE TO LONG TERM ETHYLENE OXIDE RELEASES
- STERILIZED MEDICAL DEVICE OFF GAS EXPOSURE IN WAREHOUSES
- 54 LB. ETHYLENE OXIDE RELEASE OVER 8 DAYS AT BD STERILIZATION FACILITY



HYDROGEN PEROXIDE

- PEL- 1 PPM OVER 8 HOURS
IDLH- 75 PPM
- Hydrogen peroxide breaks down into water and oxygen, leaving no harmful residues, making it safer for both patients and healthcare workers compared to ethylene oxide, which is carcinogenic.
- Hydrogen peroxide can be used as a sterilizing agent for medical devices and equipment, particularly those sensitive to heat and moisture. And prone to corrosion from EO exposure.



ETHYLENE OXIDE

- PEL- 1 PPM OVER 8 HOURS IDLH- 800 PPM
- EtO is commonly used to sterilize medical devices and equipment that are sensitive to heat and moisture, such as surgical instruments, catheters, and syringes. Can also be used for sterilization of surgical dressings, gowns, gloves, and linens, helping to prevent the spread of infections.
- Brief contact with ethylene oxide (EtO) gas can cause respiratory discomfort, headaches, nausea, vomiting, diarrhea, breathing difficulties, and bluish discoloration of the skin. Long-term exposure has been linked to cancer, reproductive issues, genetic alterations, nervous system damage, and heightened sensitivity.



PERACETIC ACID

- PEL- NO SET LIMIT IDLH- 0.55 PPM (PROPOSED)

- Widely used for health sterilization due to its strong antimicrobial properties and effectiveness against a broad spectrum of microorganisms. PAA sterilization typically requires shorter exposure times compared to other sterilization methods, allowing for faster turnaround of sterilized items.

- Acute exposure to peracetic acid is irritating to the eyes, respiratory tract, and skin. Peracetic acid is a strong sensory irritant considered to be more potent than acetic acid or hydrogen peroxide yet is a safer alternative to other methods.





OSHA AND ENVIRONMENTAL REGULATIONS

OSHA Regulations

- Specific IDLH and PEL limits set for toxic gases present in health sterilization applications
- Exposure events/accidents.

State and Federal Government Regulations on Gases

- Uses exposure guidelines from NIOSH and OSHA as guidelines for the health and safety of workers (some states such as California may have stricter guidelines than federal).
- EPA guidelines/regulations for emissions. Especially for Greenhouse gases (GHG) such as Methane, Carbon Dioxide, etc.

WHAT IS A MEDICAL FACILITY DO TO PREVENT EXPOSURES, INJURIES AND FINES?

EVERY TOXIC GAS PRESENT IN A MEDICAL STERILIZATION FACILITY IS DETECTABLE. THERE ARE TWO PLATFORM OPTIONS AVAILABLE FOR THESE SCENARIOS:

- PORTABLE GAS DETECTION
- FIXED GAS DETECTION



GASD 8000 PORTABLE GAS DETECTOR

- AN INTEGRAL SAMPLE PUMP, POWERED BY RECHARGEABLE LITHIUM-ION BATTERIES, GIVING UP TO 8 HOURS OF CONTINUOUS SERVICE
- DIGITAL READOUT OF CONCENTRATION, ALONG WITH REAL TIME GRAPHICS DISPLAY AND INTEGRAL DATA LOGGING
- AUDIBLE AND VISUAL ALARM
- ANALOG OUTPUT (4-20 MA AND 0-2.5 V)



ACCUSAFE FIXED GAS DETECTOR

- ONE CONTROL UNIT FOR EACH TEN SENSOR UNITS
- 5-INCH (12.7 CM) TOUCH DISPLAY, REMOTE WEB BROWSER, DESKTOP APP, MQTT API
- 8 GB DATA STORAGE (DATA ACQUISITION IS BUILT RIGHT IN)
- COMMUNICATION VIA MODBUS TCP & RTU (RS485)
- SOUND AND E-MAIL ALARMS



ALARM SETPOINTS/MEASUREMENT RANGE CRITERIA

Risk Assessment: Evaluate potential exposure scenarios and associated health risks for each gas.

Regulatory Compliance: Understand permissible exposure limits set by regulations to determine detection range requirements.

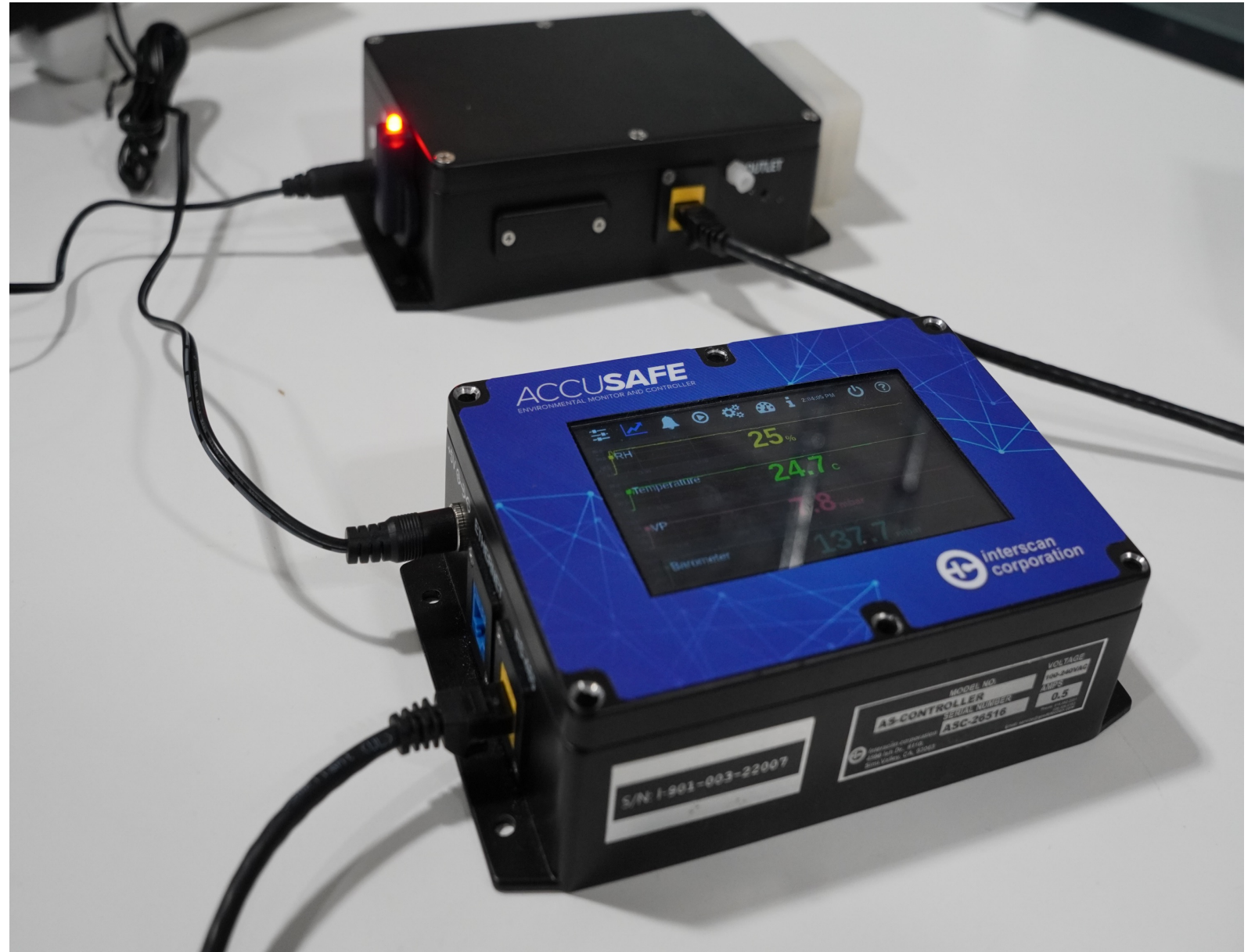
Equipment Specifications: Select detection devices capable of measuring concentrations within the anticipated exposure range.

Safety Protocols: Establish protocols for early detection of gas leaks and prompt corrective actions to ensure worker safety.



WHAT IT LOOKS LIKE TO SET UP A GAS DETECTION SYSTEM

- DISCUSS AND REVIEW APPLICATION DETAILS AND REQUIREMENTS
- PROVIDE DETECTION SOLUTIONS THAT MEET THE NEEDS AND DEMANDS OF THE MEASUREMENT APPLICATION
- PROVIDE OPERATION AND MAINTENANCE TRAINING AND SUPPORT
- DATALOGGING
- SENSOR EXPRESS
- QUICK REPLACEMENT SENSOR MODULE



Q&A

For more information, please contact me directly:

Phone: 360-833-8835 Ext. 207

Email: wbowden@cid-inc.com

Web Address: <https://www.gasdetection.com/>

Schedule a consultation:

<https://tinyurl.com/interSCAN>

