

The MMST System Information Bulletin

JUNE 1998

THE CENTER OF EXCELLENCE DISTRIBUTES "THE NUCLEAR, BIOLOGICAL, CHEMICAL TERRORISM (NBCT) EVENT" CD-ROM

The Center of Excellence in Disaster Management & Humanitarian Assistance, a World Health Organization Collaborating Center for Humanitarian Civil-Military Cooperation, is a unique and visionary partnership of three Pacific resources: The U.S. Pacific Command (USPACOM), the Tripler Army Medical Center, and the University of Hawaii. This partnership is the only model currently available to answer the mandate of education, training, and research in Operations Other Than War (OOTW), specifically, disaster management, humanitarian assistance, and NBCT events.

In December 1996, the Center of Excellence hosted a conference in Honolulu, HI, on Medical Consequence Management of Biological, Chemical, Radiation, and Terrorist Events. Through the use of lectures, Tabletop Exercises, and interactive sessions, key military and civilian emergency managers were provided the opportunity to come together to discuss relevant issues and focus on crisis/consequence management and mitigation actions unique to these events.

"The Nuclear, Biological, Chemical Terrorism (NBCT) Event" CD-ROM is the multimedia "proceedings" of that conference. This CD-ROM attempts to disseminate the information presented at the conference using digital multimedia technology. It distills the content of the original program into an interactive learning opportunity, containing both the lectures and scenarios presented at the conference. This CD is intended for those with some basic knowledge in emergency and disaster management, as well as some experience in NBC response.

For additional information about the Center of Excellence, or to request a copy of the NBCT Event CD-ROM, please contact:

The Center of Excellence in Disaster Management & Humanitarian Assistance
1 Jarrett White Road (MCPA-DM)
Tripler Army Medical Center, HI 96859-500
Tel: (808) 433-7035 / Fax: (808) 433-1757.

STUDY IDENTIFIES POTENTIAL BEHAVIORAL RESPONSES TO ACTS OF TERRORISM

A recently released study titled "Behavioral Response to Chemical and Biological Terrorism" identifies potential human behavioral responses to acts of chemical and biological terrorism. The study was conducted in support of the recent New York B.A.D (Biological Agent Drill) exercise.

The study opens with a hypothetical scenario concerning the terrorist use of a WMD on domestic soil. The study progresses through a brief review of the Cold War legacy and international politics as a prelude to the author's assessments regarding the current WMD threat. Included in this portion of the study is the author's observation that mitigation and response planning must also consider the sociological outcomes and behavioral challenges resulting from a terrorist use of a WMD. The author describes the behaviors commonly attributed to the masses in response to disaster situations. He identifies this commonly held perception as the "disaster mythology." Relying on 35 years of sociological research on behavioral responses to disaster, the author attempts to debunk the common beliefs of "disaster mythology". Rather than showing the generally perceived tendency for the depravity of mankind to emerge during disasters, he concludes the research shows that community first responders remain on the job, upholding their responsibilities, and disaster survivors emerge ready to respond to each other's needs.

In addition, the author identifies the need for emergency planners at all levels to consider behavioral responses as part of the planning process. Using historical examples of emergency responses to a variety of disaster events, he identifies strengths and weakness in the response efforts and makes recommendations on how to ensure an effective response is coordinated and implemented.

To obtain a copy of the study, or for information about the author, please contact:

Dr. Elmer May or Mr. Greg Palomares at (703) 237-8061.

The MMST System Information Bulletin

EQUIPMENT INFORMATION

The RPI MMST Support Team continues to expand and strengthen our association with vendors. Several companies offering equipment of potential use to MMST System response have recently contacted us. In our effort to continue "Sharing the Knowledge," it is our pleasure to pass this new information on. Enclosed you will find copies of the data we have received on several new products. As we have previously indicated, we are distributing this information to assist you in your equipment identification process; however, no recommendations or endorsements are implied.

NBC Agent Detection

As the RPI Team continues its technical support to the MMST System Development cities, we have noticed that one item in particular is appearing on the DoD training equipment lists. That item is the **Improved Chemical Agent Detector (ICAD)**. To ensure everyone is aware of this item, we have included it for your information.

The ICAD simultaneously detects nerve, blister, blood, and choking agents at pre-set NATO threshold levels, providing both audible and visual alarms. Detection capability is through dual electrochemical cells.

Weighing 8 ounces, the ICAD is lightweight and only slightly larger than a cigarette pack. It is easy to operate, requiring only minutes of training time. The ICAD may be configured for point or remote sensing, may be vehicle mounted or carried by personnel, and offers extended operating time (up to 4 months of continuous operation).

For additional product information, please refer to the ETG, Inc. web site at: www.envtech.com, or contact:

Environmental Technologies Group, Inc.
ATTN: Mr. Scott Goetz
1400 Taylor Ave.
Baltimore, MD 21284-9840
Tel: (410) 321-5370

EQUIPMENT INFORMATION

New Vendor Information

We have received information from two vendors offering equipment that may be of interest to you as you continue your MMST System Development process.

Colt Safety, Inc. is an 18-year-old company that warehouses and distributes Personnel Protective Equipment (PPE), Fall/Rescue Protection Equipment, First Aid Equipment, Gas Detection Equipment, and Plant Protection Equipment. Safety Technologies, Inc., a subsidiary firm, provides repair, maintenance, and calibration services for the Colt Safety, Inc. equipment line, as well as training for key Occupational Safety and Health Administration (OSHA) programs.

For additional information, please contact:

Colt Safety, Inc.
Christine J. Bierman, President and CEO
8300 Manchester Road
St. Louis, MO 63144
Tel: (314) 961-4414, Fax (314) 961-9166

International Sensor Technology (IST) provides toxic and combustible gas monitors for area air quality and safety applications, utilizing the following sensors: IST's patented solid state sensor; Infrared (IR) sensors; Photoionization Detector (PID) sensors; Electrochemical (EC) sensors; and Catalytic Bead sensors. IST manufactures both the sensors and the instrumentation used to detect more than 150 different toxic and combustible gases.

For additional information, please refer to the IST web site at: www.gotgas.com, or contact:

International Sensor Technology
3 Whatney
Irvine, CA 92618-2824
Tel: (800) 478-4271 or (714) 452-9000
Fax: (714) 452-9009

The MMST System Information Bulletin

GENERAL INFORMATION

The RPI MMST Support Team has received information regarding the Third Annual Emergency Medical Preparedness Educational Symposium sponsored by the Veterans Administration. The conference is being held at the Desmond Hotel in Albany, NY, September 22 to 24, 1998.

This year the conference is titled "It's Not If...It's When Disaster Strikes." Topics include Review of the Operations in Response to the Bombing of the Murrah Federal Building in Oklahoma City, Trends in Modern Terrorism, Chemical Terrorism, and Biological Terrorism.

For complete conference information, please contact:

Dr. Paul D. Kim, MD
Area Emergency Manager
Tel: (518) 462-3311, ext., 2364
Or:

Ms. Donna Lewis
Operations Coordinator
Tel: (518) 462-3311, ext., 3059
Or write to:

Department of Veterans Affairs
Samuel S. Stratton
VA Medical Center
113 Holland Ave.
Albany, NY 12208

Please mark your correspondence:
ATTN: Dr. Kim, or Ms. Lewis.

WEB SITES OF INTEREST

U.S. Army Research Institute of Infectious Diseases (USAMRIID)

<http://www.usamriid.army.mil>

Center of Excellence

<http://coe.tamc.amedd.army.mil>

Center for Emergency Medicine

<http://www.pitt.edu/~cemwp>

Special Operations (NBC Information)

<http://www.specialoperations.com>

Emergency Response & Research Institute

<http://www.emergency.com>

LIST OF ENCLOSURES

ETG, Inc. ICAD information

Colt Safety, Inc.

International Sensor Technology

*Our mission
is to continually improve*



Colt Safety

*the quality of distribution
through training, service, and
professionalism and
to create "partnerships"
with our customers and
suppliers that enable us
to profitably meet the
safety and hygiene needs
of the American workforce.*

Christine W. Corman
Christine W. Corman
President & CEO

Colt Safety, Inc.

8300 Manchester Road

St. Louis, MO 63144

tel • 314 • 961 • 4414

(outside 314) 800 • 475 • 2222

fax • 314 • 961 • 9166



*Welcome to the World of Colt Safety. . . We are delighted to bring this catalogue to you as we continue in our mission to **PROTECT THE AMERICAN WORKPLACE.***

Our mission is to continually improve the quality of distribution through training, service, and professionalism and to create "partnerships" with our customers and suppliers that enable us to profitably meet the safety and hygiene needs of the American workforce.

*As we strive to continuously improve our scales of efficiency and as we continuously update our training and services regarding pertinent safety, health, hygiene, and environmental concerns, we believe we are true to our strategic intent to be. . . **THE LOWEST TOTAL COST PROVIDER OF SAFETY IN THE MARKET PLACE.***

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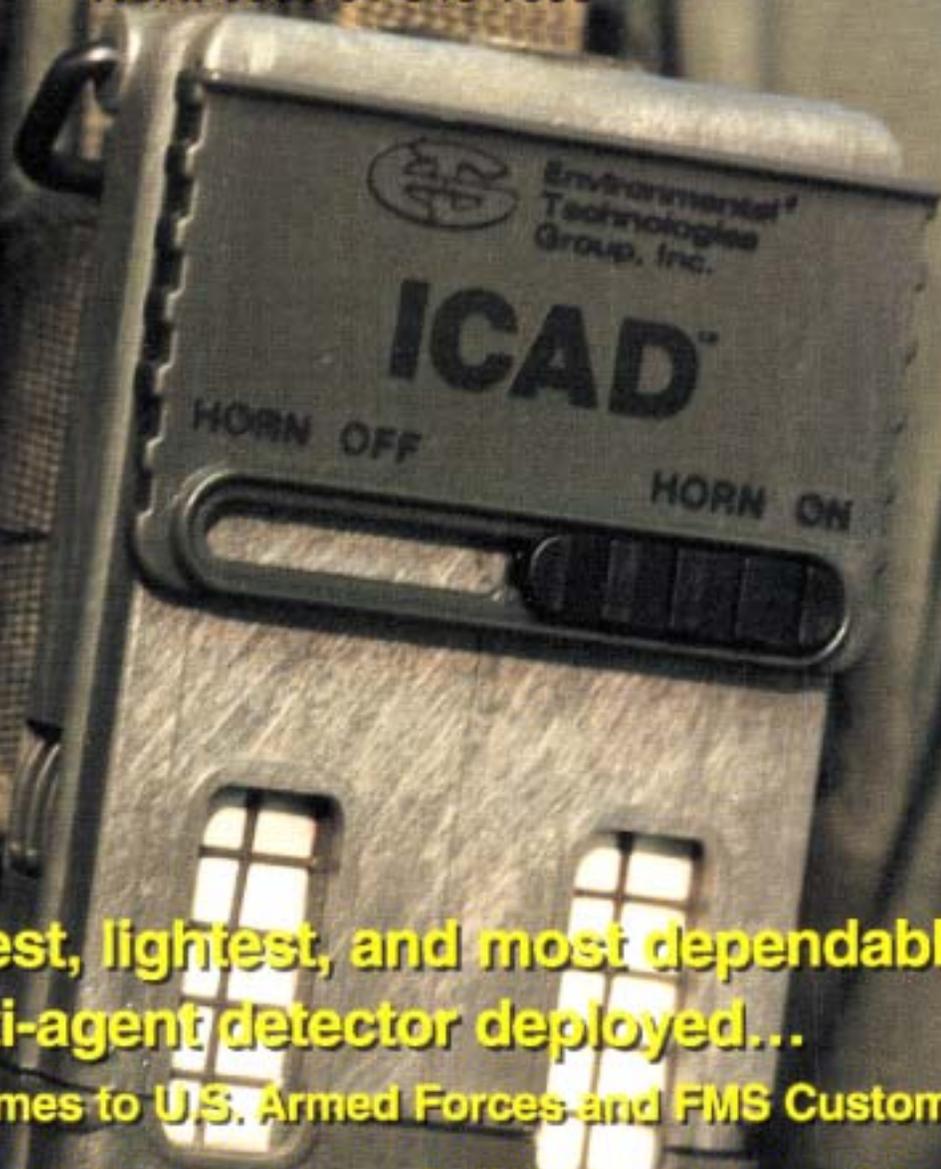
Sincerely,

Christine Bierman

*Christine J. Bierman
President & CEO*

Miniature Chemical Agent Detector (ICAD™)

NSN: 6665-01-340-1693



**The smallest, lightest, and most dependable
multi-agent detector deployed...**

...over 10,000 times to U.S. Armed Forces and FMS Customers

The ICAD Miniature Chemical Agent Detector from Environmental Technologies Group, Inc. (ETG) simultaneously detects nerve, blister, blood, and choking agents and warns personnel through both audible and visual alarms. Its dual electrochemical cells contain no radioactive source and respond to preset NATO ICT threshold levels of chemical agents. It satisfies all acceptance standards for battlefield deployment and currently is in use by U.S. and NATO forces.

The ICAD weighs only 8 ounces (215 grams) and is small in size, slightly larger than a pack of cigarettes, and light enough to be included in light forces battle packs, the ICAD is easy to operate, requiring only minutes of training time. The ICAD incorporates a replaceable sensor module which allows it to operate continuously without maintenance for up to four months. The ICAD is configured for point or remote sensor missions and can be vehicle mounted.

There is no other comparably sized detector in production which offers the capabilities and dependability of ICAD.



**Environmental
Technologies
Group, Inc.**

ICAD™

Miniature Chemical Agent Detector

NSN: 6665-01-340-1693

Features

- ▶ Simultaneously detects nerve, blister, blood, and choking agents
- ▶ Warns personnel through both audible and visual alarms
- ▶ Configured for point or remote sensor missions
- ▶ Virtually maintenance free
- ▶ Fielded Vehicle Mounted Applications

Specifications

Weight: 8 oz (215 grams)
Height: 4.3 in (11.0 cm)
Width: 2.6 in (6.6 cm)
Depth: 1.1 in (2.8 cm)
Color: Forest Green
Material: ABS Plastic

Alarms:

audible - pulsed continuous tone, fixed time duration
visual - continuous flashing LED indicators for class of agent

Clear down or reset time:

less than 2 minutes at minimum alarm levels

Maintainability:

sensor module replaceable in field by operator

Operating life:

4 months continuous service

Operating temperature:

-18°C to +45°C at 5% to 95% RH

Storage life:

5 years

Storage temperature:

-40°C to +65°C

Decontamination:

bleach with water flush or M258 Decon Kit

Performance

The ICAD meets or exceeds NATO ICt specifications; the ICAD will provide personnel sufficient warning so that no more than 5% of the personnel will experience threshold incapacitating effects. Typical performance data at 25°C as indicated.



Electronics Module

Sensor Module



ICAD
mounted
inside the
LAV



Remote
ICAD

Agent	Concentration	Time to Alarm (Seconds)
Nerve (GA, GB, GD)	0.2 - 0.5	<120
GB	> 5.0	< 30
GD, GA	> 5.0	< 60
Blister (HD)	>10.0	<120
HD,L	>50.0	< 30
Blood (AC)	>50.0	<120
Choking (CG)	>25.0	< 15

For information: Environmental Technologies Group, Inc.
1400 Taylor Avenue, P.O. Box 9840
Baltimore, MD 21284-9840
Telephone: (410) 321-5370
FAX: (410) 321-5255
Attention: CBW Marketing Manager



Overview of I.S.T. SENSORS

Various different sensor technologies are currently used for the detection of toxic and combustible gases for area air safety monitoring. Of these, the most common are Solid State, Catalytic Bead, Electrochemical, Infrared, and Photoionization Detectors (PID's). IST's diverse product line includes instruments which utilize each of these technologies, giving you the ability to select the proper sensor for your particular application. The following summarizes the characteristics of each sensor type.

ELECTROCHEMICAL (EL)
Various Toxic Gases, Low Cost,
Some Selectivity, 1-2 Year Life.

ELECTROCHEMICAL (EL): Detects 20-30 toxic gases in ppb to low ppm ranges. Provides good selectivity for some gases, but has a limited lifetime, typically 6 months to 2 years.

CATALYTIC BEAD (CB)
Combustible Gases,
2 Year Life.

CATALYTIC BEAD (CB): Detects combustible gases in higher concentrations, from 1000 ppm to %LEL levels. Not prone to interference from low levels of toxic gas. 1-2 year lifetime.

SOLID STATE (SS)
Toxic and Combustible Gases,
Long Life, Low Cost, Low Maintenance.

SOLID STATE (SS): Detects over 150 gases, both toxic and combustible, in ranges from low ppm to %LEL. Long life, typically in excess of 10 years, with many lasting 20 years or more. Are typically more prone to interference than other sensor types.

PHOTOIONIZATION DETECTOR (PID)
Volatile Organic Compounds,
Fast Response, Low ppm ranges.

PHOTOIONIZATION DETECTOR (PID): Detects most Volatile Organic Compounds (VOC's) in low ppm ranges including benzene, vinyl chloride, phosphine, and hexane, to name a few. PID's UV lamp requires periodic maintenance.

INFRARED (IR)
CO₂ and Methane,
Accurate and Reliable

INFRARED (IR): Detects CO₂ and Hydrocarbons. Offer good selectivity and good lifetime (typically 3 years or more). Ranges for CO₂ available from ppm to 20% by volume, with the lower ranges offering better resolution. Hydrocarbon ranges available from %LEL up to 100% by volume, depending on the gas.

APPLICATION NOTES FOR VARIOUS GASES:

Carbon Monoxide (CO): Both SS and EL sensors can be quite selective. Lifetime of EL sensor depends on how 'wet' the sample is. 1-2 years is typical. Readings of SS sensor can be affected by moisture or H₂, but generally the long lifetime give it the advantage over EL.

Hydrogen Sulfide (H₂S): Both SS and EL sensors exhibit good selectivity and offer similar performance. SS sensor has the overall advantage over EL sensor due to life expectancy.

Ammonia (NH₃): Constant exposure, or exposure to high concentrations of gas will severely reduce the lifetime of the EL sensor. SS sensor performs well and is generally recommended for NH₃ applications where interference is not the problem.

Hydrogen (H₂): For either ppm or %LEL ranges, the SS sensor is definitely the best choice. Outfitted with a charcoal filter, it is extremely selective and has exceptional lifetime.

Ethylene Oxide (ETO): Similar to ammonia detection, SS sensors are generally recommended but will respond to some background gases and this should be taken into consideration.

HBr, HCN, HCl, NO₂, Cl₂, PH₃, HF: Depends on application but the general rule is this: Choose EL for low ppm alarm setting applications and where selectivity is key. Choose SS sensors for long life and low maintenance.

O₃, AsH₃, PH₃, B₂H₆, COCl₂, SiH₄/GeH₄: These gases are mainly used in the semiconductor industry. IST recommends the use of EL sensors for these gases because of their selectivity and low ppm Threshold Limit Value (TLV) detection.

Oxygen (O₂): ppm or %O₂ is detected with EL only.

Carbon Dioxide (CO₂): IR is the only sensor available. Ranges available from ppm to 20% by volume.

Hydrocarbons (HCs): Can be detected with either SS, CB, or IR sensors. Generally, CB sensors have relatively short lifetimes (1-2 years) but good selectivity (for use in %LEL ranges only). SS sensors detect HC's both in ppm and %LEL and have good selectivity and exceptional lifetime. IR sensors can be used for most combustible gases, such as methane, butane, propane, ethane, kerosene, etc. They are not selective among HC's but are not prone to interferences by other gases outside the HC family. They exhibit good lifetime and, depending on the gas, can be used in ranges from ppm to % by volume.

Volatile Organic Compounds (VOC's): PID's provide detection for most VOC's in low ppm ranges. They provide fast response and good accuracy. As a low cost alternative, SS sensors can also be used for many of these gases. They are typically available in higher ppm ranges than PID's, and are generally less selective.



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The Leader In Gas Detection Since 1972

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SOLID STATE SENSOR GAS LIST

The following gases are available for detection using EST's Solid State Sensors. The full-scale ranges listed are standard ranges available. For toxic gas monitoring, ranges are typically chosen which are higher than the TLV so that hazardous levels will be detected (TLV is defined as a SAFE level). For combustible gases, the typical range is 0-100% LEL. Other ranges can also be provided—please contact EST for information. The following information is valid as of 3/95.

GAS	FULL-SCALE RANGES	GAS	FULL-SCALE RANGES
Acetic Acid	100, 200 ppm	Hexane	50, 100, 200, 2000, 2500, 3000 ppm, % LEL
Acetone	100, 200, 500, 1000, 5000 ppm, % LEL	Hexene	% LEL
Acetonitrile	100 ppm	Hydrazine	5, 10, 20, 100, 1000 ppm, 1% by Volume
Acetylene	50 ppm, % LEL, 3% by Volume	Hydrogen	50, 100, 200, 500, 1000, 2000, 5000 ppm, 3%, 5% by Vol., 2% to 100% LEL
Acrolein (Acrylaldehyde)	50 ppm	Hydrogen Bromide	50 ppm
Acrylic Acid	100 ppm	Hydrogen Chloride	50, 100, 200, 400, 500, 1000 ppm
Acrylonitrile	50, 60, 80, 100, 200, 500 ppm, % LEL	Hydrogen Cyanide	20, 30, 50, 100, 200, 1000, 10000 ppm
Allyl Alcohol	% LEL	Hydrogen Fluoride	20, 50, 100, 200 ppm
Allyl Chloride	200 ppm	Hydrogen Sulfide	5, 10, 20, 30, 50, 100, 300, 1000 ppm, % LEL
Ammonia	50, 70, 75, 100, 150, 200, 300, 400, 500, 1000, 2000, 2500, 4000, 5000 ppm, 1%, 2%, 10% by Vol., 10%, 25%, 100% LEL	Isobutane	1000, 3000 ppm, % LEL
Anisole	100 ppm	Isobutylene	% LEL
Arsenic Pentafluoride	5 ppm	Isopentane	1000 ppm
Arsine	1, 10 ppm	Isoprene	% LEL
Benzene	50, 75, 100, 1000 ppm, % LEL	Isopropanol	200, 400, 500, 1000 ppm, % LEL
Biphenyl	50%, 100% LEL	JP4	1000 ppm, % LEL
Boron Trichloride	500 ppm	JP5	1000, 5000 ppm, % LEL
Boron Trifluoride	500 ppm	Methane	100, 200, 1000, 1500, 2000, 5000 ppm, 1%, 2% by Volume, 100%, 200% LEL
Bromine	20 ppm	Methanol	200, 300, 400, 500, 1000, 2000, 5000 ppm, 15%, 30%, 100% LEL
Butadiene	50, 100, 3000 ppm, % LEL	Methyl Acetate	30 ppm
Butane	400, 1000 ppm, 100%, 200% LEL	Methyl Acrylate	60 ppm
Butanol	1000 ppm, 100% LEL	Methyl Bromide	20, 50, 60, 100, 500, 1000, 10000, 40,000 ppm
Butene	100% LEL	Methyl Butanol	% LEL
Butyl Acetate	100 ppm, % LEL	Methyl Cellosolve	% LEL
Carbon Disulfide	50, 60, 100 ppm, 5% by Volume	Methyl Chloride	100, 200, 300, 2000, 10000 ppm, % LEL
Carbon Monoxide	50, 100, 150, 200, 250, 300, 500, 1000, 3000, 5000 ppm, 3%, 5% by Volume, % LEL	Methyl Ethyl Ketone	100, 500, 1000, 4000 ppm, 100% LEL
Carbon Tetrachloride	50, 100, 10000 ppm	Methyl Hydrazine	5 ppm
Cellosolve Acetate	100 ppm	Methyl Isobutyl Ketone	200, 500, 2000 ppm, 50%, 100% LEL
Chlorine	10, 20, 50, 100, 200 ppm	Methyl Mercaptan	30 ppm
Chlorine Dioxide	10, 20 ppm	Methyl Methacrylate	100 ppm, % LEL
Chlorobutadiene	100% LEL	Methyl-Tert Butyl Ether	100% LEL
Chloroethanol	200 ppm	Methylene Chloride	20, 100, 200, 300, 400, 500, 600, 1000, 2000, 3000, 5000 ppm, % LEL
Chloroform	50, 100, 200 ppm	Mineral Spirits	200, 3000 ppm, % LEL
Chlorotrifluoroethylene	100% LEL	Monochlorobenzene	100% LEL
Cumene	100% LEL	Monoethylamine	30, 100, 1000 ppm
Cyanogen Chloride	20 ppm	Morpholine	500 ppm
Cyclohexane	100 ppm, 100% LEL	Naptha	1000 ppm, 100% LEL
Cyclopentane	50 ppm	Natural Gas	1000, 2000 ppm, 2%, 4% by Volume, % LEL
Deuterium	50%, 100% LEL	Nitric Oxide	20, 50 ppm
Diborane	10, 50 ppm	Nitrogen Dioxide	20, 50, 100 ppm
Dibromoethane	50 ppm	Nitrogen Trifluoride	50, 500, 1000 ppm
Dibutylamine	100% LEL	Nonane	2000 ppm
Dichlorobutene	1% by Volume	Oxygen	25% by Volume
Dichloroethane (EDC)	50, 100 ppm, % LEL	Pentane	200, 1000 ppm, % LEL
Dichlorofluoroethane	100, 1000 ppm	Perchloroethylene	200, 1000, 2000, 20000 ppm
Dichloropentadiene	50 ppm	Phenol	100 ppm
Dichlorosilane	50, 100 ppm	Phosgene	50 ppm
Diesel Fuel	50 ppm, 100% LEL	Phosphine	3, 5, 10, 20, 30, 50 ppm
Diethyl Benzene	100% LEL	Phosphorus Oxychloride	200 ppm
Diethyl Sulfide	10 ppm	Picoline	% LEL
Difluorochloroethane	100% LEL	Propane	100, 1000 ppm, 100% LEL
Difluoroethane (152A)	100% LEL	Propylene	100, 200, 1000, 5000 ppm, % LEL
Dimethyl Ether	100% LEL	Propylene Oxide	100 ppm, % LEL
Dimethylamine (DMA)	30, 50 ppm	Silane	10, 20, 50 ppm
Epichlorohydrin	50, 100, 500, 1000 ppm	Silicon Tetrachloride	1000 ppm
Ethane	1000 ppm	Silicon Tetrafluoride	1000 ppm
Ethanol	200, 1000, 2000 ppm, % LEL	Styrene	200, 300 ppm, % LEL
Ethyl Acetate	200, 1000 ppm, % LEL	Sulfur Dioxide	50, 100 ppm
Ethyl Benzene	200 ppm, % LEL	Tetrahydrofuran	200, 300, 1000 ppm, % LEL
Ethyl Chloride	100 ppm, % LEL	Tetraline	100 ppm
Ethyl Chlorocarbonate	1% by Volume	Toluene	50, 100, 200, 500, 2000, 5000 ppm, % LEL
Ethyl Ether	100, 800, 1000 ppm, % LEL	Toluene Diisocyanate	15 ppm
Ethylene	100, 1000, 1200 ppm, % LEL	Trichloroethane	50, 100, 500, 1000 ppm, 1% by Volume
Ethylene Oxide	5, 10, 20, 30, 50, 75, 100, 150, 200, 300, 1000, 1500, 2000, 3000 ppm, % LEL	Trichloroethylene	50, 100, 200, 300, 500, 1000, 2000 ppm, % LEL
Fluorine	20, 100 ppm	Triethylamine (TEA)	100 ppm
Formaldehyde	15, 50, 100, 500, 1000 ppm	Trifluoroethanol	25, 100 ppm
Freon-11	1000, 2000, 5000 ppm	Trimethylamine (TMA)	50 ppm
Freon-12	1000, 2000, 3000 ppm	Tungsten Hexafluoride	50 ppm
Freon-22	100, 200, 500, 1000, 2000 ppm	Turpentine	% LEL
Freon-113	100, 200, 500, 1000, 2000 ppm, 1% by Vol.	Vinyl Acetate	1000 ppm, % LEL
Freon-114	1000, 2000, 20000 ppm	Vinyl Chloride	20, 50, 100, 200, 400, 500, 1000, 4000, 10000 ppm, 10%, 100% LEL
Freon-123	1000 ppm	Vinylidene Chloride	50 ppm
Fuel Oil or Kerosene	100% LEL	Xylene	100, 200, 300, 1000 ppm, 1% by Volume
Gasoline	100, 1000, 2000, 20000 ppm., % LEL		
Germane	10, 50 ppm		
Heptane	1000 ppm, % LEL		



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