

Arizona Chapter Semiconductor Environmental Safety Health Association (SESHA)

COMMITTED TO
ENVIRONMENTAL
HEALTH AND
SAFETY

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ENVIRONMENTAL

DIESEL ENGINE EXHAUSTS ARE TOP CANCER RISK FROM AIR TOXICS

Data originating from a new US Environmental Protection Agency (EPA) study but processed by Environmental Defense, one of the country's best-known nongovernmental organizations, provides a startling interpretation of the cancer risk in the air from hazardous pollutants.

Nationwide, exhaust from diesel engines accounts for 78% of the total added cancer risk, based on EPA's detailed estimates of the levels of the 41 most hazardous pollutants in every community in the U.S.

It is hard to find any area where diesel particulates are responsible for less than 60% of the total cancer risk, even in heavy industrial areas known as cancer alleys.

"It is not the big smokestacks on the horizon, it is the little smokestack on the bumper that is really our problem," Environmental Defense Senior Attorney David Roe affirms. "If you care about health problems in the air, diesel has to be your priority number one, number two, and number three. Air health is a very serious concern. The silver lining is that you can deal with so much of the air health problem by focusing on only one pollutant," Roe said.



The Environmental Defense Web site (<http://www.scorecard.org>) is able to translate quantities of hazardous air pollutants into cancer risks, both nationally and for any locality. Diesel's predominance leads to surprising findings. Based on EPA's most current data, Maricopa County ranked among the dirtiest/worst 10% of all counties in the U.S. in terms of an average individual's added cancer risk from hazardous air pollutants:

2,934,092 people in Maricopa County face a cancer risk more than 100 times the goal set by the Clean Air Act:

- 92 % of the air cancer risk is from mobile sources
- 8% of the air cancer risk is from area sources
- 0.061% of the air cancer risk is from point sources

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SAFETY

CHEMICAL SAFETY BOARD (CSB) ISSUES TWO SAFETY BULLETINS

The U.S. Chemical Safety and Hazard Investigation Board (CSB) have issued two special Safety Bulletins arising out of Board accident investigations.

Management of Change

One bulletin focuses on safely assessing and controlling hazards associated with changes in chemical processes, commonly known as "Management of Change." Management of Change is a central feature of the Process Safety Management standard of the U.S. Occupational Safety and Health Administration (OSHA).

Ineffective Management of Change likely contributed to three serious accidents investigated by the Board:

- a fire at the Puget Sound Refining Company (Equilon) in Anacortes, Washington;
- a fire and explosion during specialized operations at a petroleum well in Bienville Parish, Louisiana; and
- a runaway reaction and fire at a Condea Vista chemical plant in Baltimore, Maryland. All three incidents occurred during the fall of 1998, the first year of the Board's operations.

CSB Safety Bulletins are informational publications on significant topics in chemical safety, usually stemming from Board investigations or hazard studies. The intended audience includes plant managers, engineers, operators; and safety professionals. By distilling the messages from multiple events, CSB hopes to draw heightened attention to the common, preventable causes of chemical accidents.



Hazards Associated with Hydroxylamine, a Potentially Explosive Substance Used in Semiconductor Manufacturing

A second bulletin draws attention to the hazards associated with hydroxylamine, a potentially explosive substance used in semiconductor manufacturing and other applications. On February 19, 1999, a hydroxylamine explosion destroyed the

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RECYCLING**REDUCE REUSE REPAIR REFUSE RETHINK
RECOVER - What You Can Do!**

Environmental problems have become so complex that many individuals feel they can have no effect on them. Problems like oil spills, hazardous waste, loss of rain forests, the ozone layer, the municipal waste crisis can feel out of our control. At the very least, these problems require group and corporate action or government intervention. But there are some things all organizations and individuals can control. A waste reduction and recycling activities can make a difference.

REDUCE**Paper**

- use email, newsgroups and the WWW rather than paper copy
- purchase two-sided copiers
- reduce paper by using both sides of the paper,
- keep all appropriate records on computer disk, not in paper copies

Food and Food Containers

- use food compost programs
- replace disposable cups, plates and cutlery with reusable items; use your own mug
- use bulk dispensers for condiments

Landscaping Materials

- use landscape clippings and yard waste as compost or mulch

Energy

- turn off unnecessary lighting, heating or cooling systems, computer terminals, printers and photocopiers at night and on weekends

Water

- turn off taps completely when not in use; don't run water unnecessarily
- install flow restrictors on all taps and showers

REUSE**Paper, Cartridges, Boxes and Containers**

- create scratch pads from paper used on one side
- reuse old file folders
- reuse manilla envelopes for internal circulation
- purchase re-manufactured laser cartridges
- use ribbon cartridge re-inking service
- reuse boxes and shipping/packaging materials

Furniture and Equipment

- check surplus sales for furniture and equipment before buying new

Wood and Chemicals

- reuse wooden skids, leave wood beside waste dumpsters for recycling
- check the chemical exchange operated by the facility before ordering new chemicals

REPAIR

- repair/machine shops repair furniture and equipment using used materials
- repair all leaking faucets

REFUSE

- ask your suppliers to deliver goods without packaging or



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ENVIRONMENTAL**WHY DO COMPANIES PURSUE ISO 14001
CERTIFICATION?**

Recently the debate around third-party registration under ISO 14001 is heating up. Many companies are taking the "wait and see" approach to evaluate whether there is value in pursuing ISO 14001 certification. At the same time, some companies have taken steps to get one or more of their sites certified. What were the key considerations that went into their decision to get certified to the standard?

1. Promote a leading environmental image. For some companies, ISO 14001 certification is important tool to maintaining a position of environmental leadership and being recognized as a world-class organization.
2. Be competitive. Being an ISO 14001-certified company ensures access to global markets, and certification may tip the balance in its favor when competing with a similar noncertified company.
3. Achieve strong environmental performance. Implementing an environmental management system (EMS) such as ISO 14001 can help companies achieve sustained environmental performance across the board, develop new mechanisms that foster continued improvement, and ensure a stringent level of control over their operations.
4. Reduce cost/increase profits. The energy and waste minimization achieved through an effective EMS is a bottom-line business benefit.
5. Reduce cost/increase profits. The energy and waste minimization achieved through an effective EMS is a bottom-line business benefit.
6. Minimize risk. The implementation of ISO 14001 can be used as a means to limit liability.

If your organization is assessing the value of implementing an environmental management system (EMS) such as ISO14001, consider accessing the resources available within the Arizona SESH Chapter. SESH is engaged with and actively supports multiple disciplines, including safety, environmental, occupational health and risk management. Join the Chapter! .■

 **New Emergency Numbers** 

The telephone system at the Agency for Toxic Substance and Disease Registry (ATSDR) and the joint CDC/ATSDR 24-hour Emergency Response Line were recently upgraded and the telephone numbers changed. Use the following new numbers to reach the Agency:

- Public health consultative support from ATSDR during industrial chemical emergencies: 404-498-0120
- Public health consultative support from CDC during natural disaster or oil spills: 770-488-7100
- ATSDR fax: 404-498-0056
- CDC fax: 770-488-7107

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- in returnable, reusable containers instead of cardboard boxes
- request suppliers 'take back' packaging materials on large volume orders

RETHINK

Materials

- use one paper towel instead of two or three or let your hands air dry
- order one phone book per department instead of one per person or use the online version, if available
- purchase paper and paper products with high post-consumer recycled content
- think hard about the need before purchasing any non-reusable or non-recyclable products; buy environmental friendly alternatives whenever possible
- use non-toxic, environmental friendly cleaners
- store and dispose of hazardous materials in the proper manner; do not pour them on the ground or put them out with regular garbage

Energy

- turn off lights in unoccupied rooms
- rearrange your office or room layout to take advantage of natural daylight
- use alternatives to air conditioning such as opening windows or hanging blinds

Transportation

- walk, bike, carpool, or bus to work

RECOVER

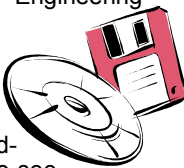
- recover motor oil from vehicles and send for recycling
- recover and recycle silver and bleach solutions in film-processing solutions.

If your company has an effective recycling and waste management program implemented, let the Arizona SE-SHA Chapter know. We would like to showcase your program in an upcoming newsletter!

Software Review - Risk Assessment Guide for Semiconductor Equipment.

This is a software package that does everything it advertises. Design Safety Engineering Inc. has come up with a product that enables the user to do a well-defined risk analysis for virtually every aspect of the semi-conductor industry. From cleaning service personnel to maintenance technician to process engineer virtually every aspect and possible hazard situation is covered. After reading the on-line tutorial, nearly anyone should be able to create a hazard based or tasked based risk analysis for their personnel. With an analysis that covers everything from possible occurrence, severity of injury, to preventative measures, and personal protective equipment it appears that Design Safety Engineering Inc., has thought of everything.

This software package has an excellent tutorial, and help that actually provides the answers you need to complete your risks assessment without creating a major headache. You will need to play around a bit to see where things fit and how it all comes together but the time is well worth the effort. At a cost of \$1,695.00 for non-semi members and \$1,295.00 for members, it is well worth the price. You can download a free demo of the program at <http://dom.semi.org/webcatalog.nsf/itemList?OpenForm&group=1658> and take this one for a test drive.



ENVIRONMENTAL *Continued*

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In 2000, Maricopa County ranked in the top 20% of all counties in the state in terms of exposure of sulfur dioxide concentrations.

The diesel emissions problem comes not only from trucks and buses, but also from off-road equipment like bulldozers and heavy construction machinery.

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Web site: <http://www.environmentaldefense.org>.



HEALTH

Indoor Air Quality and Mold

EPA scientists have developed an innovative way to detect potentially dangerous molds much faster and with more accuracy. The new technology can be used to detect the mold *Stachybotrys*, known as "black mold" and more than 50 other possibly problematic molds.

Molds typically grow in buildings affected by water damage and have been found in businesses, homes, hospitals, schools and office buildings. It is estimated that about 50 to 100 common indoor mold types have the potential for creating health problems. Exposure to mold has been identified as a potential cause of many health problems including asthma, sinusitis, and infections. It is also believed that molds play a major role in cases of sick building syndrome and related illnesses.

Introduction to Molds

Molds produce tiny spores to reproduce. Mold spores waft through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. When excessive moisture or water accumulates indoors, mold growth will often occur, particularly if the moisture problem remains undiscovered or un-addressed. There is no practical way to eliminate all mold and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.

What Should Occupational Health Professionals Know About Mold?

- Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints.
- There is no practical way to eliminate all mold and mold spores in the indoor environment; the way to control indoor mold growth is to control moisture.
- If mold is a problem in your facility, you must clean up the mold and eliminate sources of moisture.
- Fix the source of the water problem or leak to prevent mold growth.
- Reduce indoor humidity (to 30-60%) to decrease mold

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Semiconductor Business News

Is the bottom near? SEMI book-to-bill rises to 0.67 on slightly higher orders for chip gear

SAN JOSE -- Orders for chip production systems grew 5% in July from the previous month at North American-based suppliers, but shipments fell 12% from June, reported the Semiconductor Equipment and Materials International (SEMI) trade group.

The drop in tool shipments and slight rise in orders pushed SEMI's book-to-bill to a reading of 0.67 from 0.56 in June. The July book-to-bill reading was the third consecutive increase in the index since the ratio hit its lowest point ever in April at 0.44. A book-to-bill of 0.67 means \$67 worth of new orders were received by suppliers for \$100 of products shipped.

"The bookings figures provide some indication that capital equipment orders may have reached bottom, though capital equipment manufacturers remain cautious given the existing uncertainties for the world's economies and for the semiconductor industry looking ahead," said Elizabeth Schumann, director of industry research and statistics for SEMI.

SEMI said North American-based chip equipment suppliers received \$764.2 million in orders during July compared to \$727.5 million in June, based on a three-month moving average. Bookings were 74% lower than \$2.9 billion in July 2000, according to SEMI's Express Report.

North American-based suppliers shipped \$1.14 billion in equipment worldwide in July, which is a drop of 12% from \$1.29 billion in June, based on SEMI's three-month average. Equipment billings were 52% lower than \$2.4 billion in July 2000, said the trade group.

Last month, SEMI released its mid-year consensus forecast, which showed a 35% drop in semiconductor equipment sales to \$31 billion in 2001 from \$47.7 billion last year. Some market analysts are predicting a greater drop in tool sales this year as the chip industry struggles with what many believe is the worst semiconductor recession in history. ■

SAFETY *Continued*

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Concept Sciences plant in Allentown, Pennsylvania, killing five. The blast left the U.S. without any domestic sources of hydroxylamine.



CSB contracted earlier this year with General Physics Corporation, a Maryland engineering firm, to review case files for the above investigations. The consultants evaluated the resources needed to complete each investigation, the obstacles to producing high-quality scientific reports, and the accident prevention value of the finished products.

About CSB: The CSB is a scientific investigatory organization, not an enforcement or regulatory body. The Board determines the root causes of accidents, issues safety recommendations, and performs special studies on chemical safety issues. CSB was formed in 1998. The safety bulletins and first annual report are available on the CSB web site: www.chemsafety.gov. ■

Book Review - The Behavior-Based Safety Process: Managing Involvement for an Injury-Free Culture, 2nd Edition, by Thomas R. Krause, Stanley Hodson (Contributor), John H. Hidley (Contributor)

In meeting the need for continuous improvement in safety performance, the behavior-based approach presents many parallels with the quality improvement process. Both of these approaches use scientific methods to identify, measure, and provide feedback on upstream factors of excellence. In addition to presenting the parallels with quality, this volume also provides techniques aimed at implementation issues such as organizational development, trainer training, and employee involvement.



Krause and his contributors deliver a book that combines both theoretical concepts of behavior-based safety with practical, state-of-the-art information on the effective assessment and implementation of actual safety programs. In this updated Second Edition, new case histories discuss safety performance measurement, management's role in sustaining an employee-driven process, computer software, networking, and data collection. ■

→ Did You Know? ←

- Percent of junk mail never opened: 11. *Source: Direct Marketing Association*
- Percent of junk mail recycled: 5.2. *Source: Advertising Mail Marketing Association*
- Amount of trash thrown out by average person annually: 1,500 pounds. *Source: Embracing the Earth, Mark Harris*
- Amount of trash thrown out by person who composts: 375 pounds. *Source: Embracing the Earth, Mark Harris*
- Amount of money spent by Americans on lawn care aid annually: \$6 billion. *Source: Warren Schultz, The Chemical-Free Lawn*
- Increased likelihood that children who live in homes where chemical weed and insect killers are used will develop cancer: four times. *Source: American Journal of Public Health, Feb 1995*
- Number of miles logged by the average commuter every year: 4,000. *Source: U.S. Dept of Transportation*
- Percentage of solar energy absorbed by dark-colored roofing material: 70. *Source: EERE, Cooling Your Home Naturally*
- Percentage by which cooling bills could be cut if roofing material were white: 10. *Source: EERE, Cooling Your Home Naturally*
- Percentage of solar energy a Norway maple can prevent from striking a house: 75. *Source: Energy-Efficient and Environmental Landscaping*
- Gallons of water flushed down conventional toilets annually by average family: 29,200. *Source: How to Get Water Smart*
- Gallons of water flushed down low-flow toilets annually by average family: 8,760. *Source: How to Get Water Smart*
- Number of people per car in United States: 1.8. *Source: Statistical Record of the Environment*
- Number of people per car in China: 1,074. *Source: Statistical Record of the Environment* ■

Conferences and Symposia

10th International Symposium on Semiconductor Manufacturing (ISSM), October 8-10 (San Jose, CA)

The International Symposium on Semiconductor Manufacturing (ISSM) is an annual conference of semiconductor manufacturing professionals dedicated to sharing technical solutions and opinions on the advancement of manufacturing science, technology, and management. ISSM has been held in Japan and in the U.S. in alternate years since 1992. The site is the Fairmont Hotel, San Jose, California. For more information, please go to: <http://www.issm.com>

Semicon Southwest 2001, Exposition-October 16-17 Programs-October 14-17 (Austin Convention Center, Austin, TX)

SEMICON Southwest is back! Thousands of industry professionals will gather at SEMICON Southwest. This is your chance to network with these industry leaders, advance your career, and find out what's really happening in the semiconductor business. Once there, see a vast array of innovations showcased in more than 600 exhibits. This year, SEMICON Southwest introduces the SEMI Technology Symposium. Find out more about SEMICON Southwest visit our web site at <http://www.semi.org/semiconsouthwest>



Environmental, Health & Safety (EHS) Issues in Advanced Lithography Roundtable, October 16, 8:00 am - 12:00 pm (Austin Convention Center, Austin, TX)

This forum will allow for information exchange from the perspectives of the photolithography research community, chemical and equipment suppliers and device manufacturers. The Roundtable is a cooperative effort between International SEMATECH and the SEMI Chemical and Gas Manufacturers Group (CGMG). Free Event, but Pre-registration is required. Register on line by October 9th and receive free admission to the exhibits: <http://www.semi.org/web/wcontent.nsf/url/SWEHSRound>

Semi Presents a New Program in Conjunction with Semicon Southwest, OCTOBER 18-19 (Advanced Micro Devices, Austin, TX)

SEMI will offer you and your team the opportunity to participate in the newly developed Basic Self-Assessment and Validation Methodology Training, SSQA-Standardized Supplier assessment Training and SSQA Lead Validator Training, held in conjunction with SEMICON Southwest 2001. Courses will provide students the basics of conducting a self-assessment, creating assessment schedules and recognition of significant activities and skills for the team leaders. Visit <http://www.semi.org/semiconsouthwest>

27th International Electronics Manufacturing Technology (IEMT) Symposium 2001, November 12-13 (Marriott Hotel, Santa Clara, CA)

IEMT Symposium is a forum for discussion of issues associated with leading edge electronics manufacturing. The conference features technical sessions, panels and opportunities to meet with experts in the area. It is the second largest IEEE/CPMT conference in the United States and is held in the US each fall and also annually in either Japan or Europe. For information - <http://www.semi.org/web/wcontent.nsf/url/psIEMTHome>

HEALTH *Continued*

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- growth by: venting bathrooms, dryers, and other moisture-generating sources to the outside; using air conditioners; increasing ventilation; and using exhaust fans whenever working with moisture-generating sources.
- Clean and dry any damp or wet building materials and furnishings within 24-48 hours to prevent mold growth.
- Clean mold off hard surfaces with water and detergent, and dry completely. Absorbent materials such as ceiling tiles, that are moldy, may need to be replaced.
- Prevent condensation: Reduce the potential for condensation on cold surfaces (i.e., windows, piping, exterior walls, roof, or floors) by adding insulation.
- In areas where there is a perpetual moisture problem, do not install carpeting (i.e., by drinking fountains, by sinks, or on concrete floors with leaks).
- Molds can be found almost anywhere; it can grow on virtually any substance, providing moisture is present.

Basic Mold Cleanup

The key to mold control is moisture control. It is important to dry water-damaged areas and items within 24-48 hours to prevent mold growth. If mold is a problem in your facility, clean up the mold and get rid of the excess water or moisture. Fix leaky plumbing or other sources of water. Wash mold off hard surfaces with detergent and water, and dry completely. Absorbent materials (such as ceiling tiles & carpet) that become moldy may have to be replaced.

Large Buildings: How to Identify the Cause of a Mold and Mildew Problem

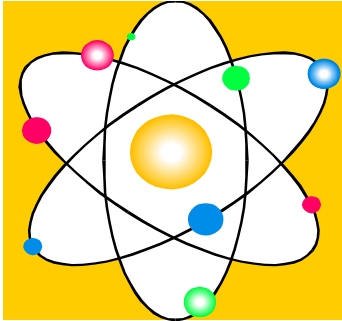
Mold and mildew are commonly found on the exterior wall surfaces of corner rooms in heating climate locations. An exposed corner room is likely to be significantly colder than adjoining rooms, so that it has a higher relative humidity (RH) than other rooms at the same water vapor pressure. If mold and mildew growth are found in a corner room, then relative humidity next to the room surfaces is above 70%. However, is the RH above 70% at the surfaces because the room is too cold or because there is too much moisture present (high water vapor pressure)?

The amount of moisture in the room can be estimated by measuring both temperature and RH at the same location and at the same time. Suppose there are two cases. In the first case, assume that the RH is 30% and the temperature is 70°F in the middle of the room. The low RH at that temperature indicates that the water vapor pressure (or absolute humidity) is low. The high surface RH is probably due to room surfaces that are "too cold." Temperature is the dominating factor, and control strategies should involve increasing the temperature at cold room surfaces.

In the second case, assume that the RH is 50% and the

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HEALTH *Continued*

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temperature is 70°F in the middle of the room. The higher RH at that temperature indicates that the water vapor pressure is high and there is a relatively large amount of moisture in the air. The high surface RH is probably due to air that is "too moist." Humidity is the dominating factor, and control strategies should involve decreasing the moisture content of the indoor air.

Indoor Air Regulations Standards or Threshold Limit Values (TLVs) for airborne concentrations of mold, or mold spores, have not been set. Currently, there are no EPA regulations or standards for airborne mold contaminants.

Additional information on molds is available on the EPA website at www.epa.gov/iaq/.

MEMBERSHIP REQUEST/CHANGE OF ADDRESS REQUEST

Name: _____

Professional Certifications: _____

Company Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Business Address: or Home Address: AZ Section Member Since: _____

Daytime Phone: _____ Fax: _____

Member National SESA yes no Membership Number: _____

Other Professional Organizations: _____

E-Mail Address _____

Please mail or fax this form to the secretary @ (480) 345-6477. Application forms are also available at the Arizona Chapter meetings.