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Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

Assessing Dangers of Dust Explosion

Dust explosions are a serious hazard in the process industries. They have led to the destruction of property and damage to facilities and equipment. In the worst circumstances, they may also lead to injury of plant personnel and even fatalities. In 2017 alone, there were 68 globally reported cases of dust explosions with 163 injuries and 13 fatalities. They are not as common as flammable vapor or gas explosions, but they do occur often.

With the potential for such a dangerous workplace hazard, the reader may assume that there are federal and state laws in place protecting worker safety. However, there are currently no laws in place at the state or federal level protecting workers against dust explosion hazards.

Read more:
https://ohsonline.com/articles/2021/02/01/assessing-dangers-of-dust-explosions.aspx?admgarea=news

Special Interest Articles:

Contents:

Exposure of Adult Female Mice to Low Doses of di(2-ethylhexyl) Phthalate Alone or in an Environmental Phthalate Mixture: Evaluation of Reproductive Behavior and Underlying Neural Mechanisms

Background:
We have previously shown that adult male mice exposure to low doses of an ubiquitous endocrine disruptor, di(2-ethylhexyl) phthalate (DEHP), alters courtship behavior.

Objective:
The effects of adult exposure to low doses of DEHP alone or in an environmental phthalate mixture on estrous cyclicity, reproductive behavior, and underlying neural structures were analyzed in female mice.

Methods:
Two-month-old C57BL/6J females were exposed orally for 6 wk to DEHP alone (0, 5 or 50μg/kg/d) or to DEHP (5μg/kg/d) in a phthalate mixture. Estrous cyclicity was analyzed in intact mice, and behavior [lordosis, olfactory preference, partner preference, ability to stimulate male ultrasonic vocalizations (USVs)] was measured in ovariectomized mice primed with estradiol and progesterone.

Immunohistochemical studies were conducted in the neural structures involved in behavior for estrogen receptor (ER) α and progesterone receptor (PR).

Results:
Exposure to DEHP alone or in mixture lengthened the estrous cycle duration, with a shorter proestrus and longer estrus and metestrus stages. Under normalized hormonal levels, females exposed to DEHP alone or in mixture exhibited altered olfactory preference. A lower lordosis behavior and ability to attract and stimulate male emission of

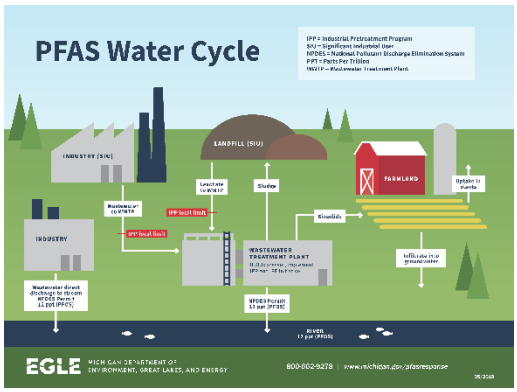
courtship USVs was observed, probably due to modifications of pheromonal emission in exposed females.

Read more: https://ehp.niehs.nih.gov/doi/full/10.1289/EHP7662

Lawsuits and Limits Multiply With PFAS Chemicals Problem

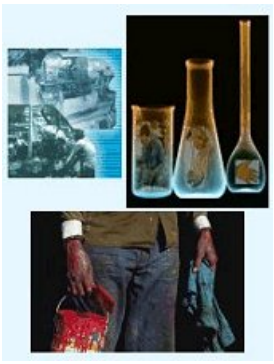
Lawsuits and environmental cleanups are expected to grow exponentially for producers and even users of some 7,000 per- and polyfluoroalkyl substances, known collectively as PFAS, as more states set exposure limits and Biden administration regulators weigh specific drinking water rules or declare as hazardous substances the chemicals with wide business and consumer use in products.

The Orange County, Calif., water district and 10 cities and local utilities, facing what they claim is a $1-billion-plus cleanup of surface water and groundwater PFAS sources, filed suit last month in state court against chemical makers 3M, Dupont and others.



Read more: https://www.enr.com/articles/51033-lawsuits-and-limits-multiply-with-pfas-chemicals-problem

Modeling Occupational Exposure to Solvent Vapors Using the Two-Zone (Near-Field/Far-Field) Model: A Literature Review



The Two-Zone model is used in occupational hygiene to predict both near-field and far-field airborne contaminant concentrations. A literature review was carried out on 21 scientific publications in which the Two-Zone model was used to assess occupational exposure to solvent vapors. Data on exposure scenarios, solvents, generation/emission rates, near- and far-field parameters, and model performance were collected and analyzed. Over the 24 exposure scenarios identified, 18 were evaluated under controlled conditions, 5 under normal workplace

activities, and 1 was reported based on literature data. The scenarios involved a variety of tasks which consisted, mostly, of cleaning metal parts, spraying solvents onto surfaces, spilling liquids, and filling containers with volatile substances. Twenty-eight different solvents were modeled and the most commonly tested were benzene, toluene, and acetone. Emission rates were considered constant in 16 scenarios, exponentially decreasing in 6 scenarios, and intermittent in 2 scenarios. Four-hundred-and-forty-six (446) predicted-to-measured concentration ratios were calculated across the 21 studies; 441 were obtained in controlled conditions, 4 under normal workplace activities, and 1 was calculated based on the literature data. For controlled studies, the Two-Zone model predictive performance was within a factor of 0.3–3.7 times the measured concentrations with 93% of the values between 0.5 and 2. The model overestimated the measured concentrations in 63% of the evaluations. The median predicted concentration for the near-field was 1.38 vs. 1.02 for the far-field. Results suggest that the model might be a useful tool for predicting occupational exposure to vapors of solvents by providing a conservative approach. Harmonization in model testing strategies and data presentation is needed in future studies to improve the assessment of the predictability of the Two-Zone model. Moreover, this review has provided a database of exposure scenarios, input parameter values, and model predictive performances which can be useful to occupational hygienists in their future modeling activities.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 07 Jan 2021 (Available with AIHA membership)

Comparing Respirator Laboratory Protection Factors Measured with Novel Personal Instruments to those from the Porta count

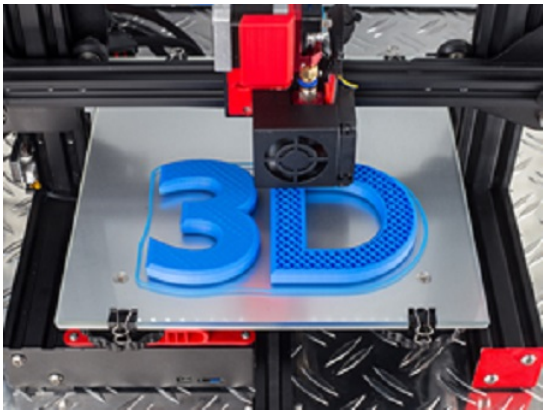
A quantitative fit test is performed using a benchtop instrument (e.g., TSI PortaCount) to assess the fit factor provided by a respirator when assigned to a worker. There are no wearable instruments on the market to measure protection factors while the respirator is in use. The aim of this study is to evaluate two new, wearable, quantitative instruments—a dual-channel optical particle counter (DC OPC) and a dual-channel condensation particle counter

(DC CPC)—that would enable *in-situ*, real-time measurement of respirator workplace protection factor. Respirator laboratory

protection factors measured by the new instruments were compared to those measured with the TSI PortaCount on one test subject for three test aerosols (sodium chloride, incense, ambient) at target laboratory protection factors of 100, 300, and 1,000 for sodium chloride and ambient, and 75 and 500 for incense. Three replicates were performed for each test condition. Data were analyzed with a two-sided paired t-test at a significance level of 0.05. Laboratory protection factors measured with the DC CPC agree with those measured with the PortaCount whereas those from the DC OPC generally do not. Mean laboratory protection factors derived from the DC CPC are only statistically significantly different for mean values of a laboratory protection factor at ambient conditions for a target laboratory protection factor of 300 (p = 0.02) and for incense at a target laboratory protection factor of 75 (p = 0.03). Although statistically significant, the difference in laboratory protection factors derived from the DC CPC are not substantial in practice and may be explained by systematic uncertainty. In contrast, the DC OPC reports substantially larger mean laboratory protection factors, differing by about half an order of magnitude in extreme cases, and statistically significantly different mean laboratory protection factors for the sodium chloride aerosol for target laboratory protection factors of 100 and 300 (p = 0.01 and p = 0.01).

Read more: Journal of Occupational and Environmental Hygiene, Published online: 06 Jan 2021 (Available with AIHA membership)

3D Printing and Worker Safety



3D printing is an additive manufacturing technology that has experienced widespread growth across numerous industries in recent years. It's used in a wide variety of settings, including laboratories, factories, hospitals and schools.

Still, despite its popularity, "3D printing is still a relatively new technology and there are many gaps in the information available about health and safety risks," NIOSH cautions.

Potential hazards, the agency says, include breathing in toxic particles; skin contact with harmful substances; and static, fire and explosions.

Read more:
https://www.safetyandhealthmagazine.com/articles/20753-d-printing-and-worker-safety

Dry ice and liquid nitrogen: Alert warns of serious health risks to workers

Dry ice and liquid nitrogen pose potentially deadly health risks to workers in food, beverage and other businesses that use, transport or store these cooling agents, the Washington State Department of Labor & Industries warns in a new hazard alert.
When dry ice and liquid nitrogen are exposed to air, they become a gas – carbon dioxide and nitrogen dioxide, respectively – and displace oxygen, which then can lead to suffocation, the alert states.
Other hazards presented by dry ice – solid carbon dioxide – and liquid nitrogen include ice burns and permanent frostbite damage to unprotected skin and eyes, as well as explosions when pressure builds up in non-

venting, airtight containers holding either product.

Read more:
https://www.safetyandhealthmagazine.com/articles/20768-dry-ice-and-liquid-nitrogen-alert-warns-of-serious-health-risks-to-workers

Radiation

Radiation Safety in Use of Nuclear Gauges: IAEA Issues Recommendations

Nuclear gauges are devices with a radioactive source or radiation generator, which are used to measure parameters such as thickness, density and moisture in materials like pavements, petroleum and plastic. Several hundred thousand nuclear gauges are in operation globally, and the IAEA has released its latest guide in its Safety Standards Series: Radiation Safety in the Use of Nuclear Gauges (No. SSG-58).

"Nuclear gauges contain small amounts of radioactive material, so it's essential that operators conduct their work using carefully controlled methods, to protect themselves, the public and the environment against exposure to radiation," said Haridasan Pappinisseri, an IAEA Radiation Protection Specialist in charge of the preparation of this publication.

Read more:
https://www.iaea.org/newscenter/news/radiation-safety-in-use-of-nuclear-gauges-iaea-issues-recommendations

Ventilation

Free Online Tool Calculates Risk of COVID-19 Transmission in Poorly-Ventilated Spaces

The vital role of ventilation in the spread of COVID-19 has been quantified by researchers, who have found that in poorly-ventilated spaces, the virus spreads further than two metres in seconds, and is far more likely to spread through prolonged talking than through coughing.

The results, reported in the journal *Proceedings of the Royal Society A*, show that social distancing measures alone do not provide adequate protection from the virus, and further emphasise the vital importance of ventilation and face masks in order to slow the spread of COVID-19.

Read more:
https://www.sciencedaily.com/releases/2021/01/210119194403.htm

PPE

Bench Testing of Noninvasive Ventilation Masks With Viral Filters for the Protection from Inhalation of Infectious Respirable Particles

During the beginning of the SARS-CoV-2 pandemic, there was a shortage of masks and respirators for the protection of health care professionals. Masks for noninvasive ventilation (NIV) in combination with viral-proof filters, worn by healthcare workers, could serve as an alternative protection measure. We determined the simulated protection factor (SPF) of such devices in comparison to conventional surgical masks, N95, and FFP3 respirators. Masks and respirators were mounted on a ventilated mannequin head in a test-chamber. Isotonic saline containing 150 MBq ^{99m}TC-DTPA (99mTc-diethylenetriamine pentaacetate (DTPA) was nebulized inside the box. The aerosol had a mass median aerodynamic diameter of 0.6 ± 0.4 µm. SPFs were measured using radioactive DTPA particles in the mannequin test system by calculating the ratio of unfiltered particles (P_u) and filtered particles (P_f) for each tested device (SPF = P_u/P_f). Simulated protection factors were 15.6 ± 3.6 for a ResMed AcuCare mask plus filter, 3.5 ± 0.2 for a ResMed Mirage Quattro FX mask plus filter, 9.5 ± 0.8 for a Loewenstein JOYCEclinc FF mask plus filter, 1.9 ± 0.2 for a surgical mask with a rubber band, 2.7 ± 0.7 for a surgical mask with ribbons, 2.3 ± 0.3 for an FFP3 respirator, and 3.6 ± 1.3 for an N95 respirator. The ResMed AcuCare and the Loewenstein JOYCEclinic FF mask were more effective than any other of the tested devices ($p < 0.001$). In conclusion, masks normally used for NIV with viral-proof filters can effectively filter respirable particles.

Read more: Journal of Occupational and Environmental Hygiene, Published online: 07 Dec 2020 (Available with AIHA membership)

COVID-19 Face Masks: How High-Filtration Masks — Like the KN95, N95 and KN94 — Differ

You've heard of N95 and KN95 masks — but have you heard of the KF94, and what's the difference between the three?

There are many high-quality masks on the market with different letters and numbers. Understandably, this can be confusing. However, to decipher their differences and how each one works, one must have an understanding of what the different letters and numbers represent.

"The number on all of those refers to its filtration efficiency, so the percentage of articles that it stops from getting through," said Dr. John Volckens, a professor of Mechanical Engineering at Colorado State University.

Read more:
https://www.salon.com/2021/01/27/covid-19-face-masks-how-filtration-masks--like-the-kn95-n95-and-kn94--differ/

Noise

NAMRU-Dayton's Hearing Health Program

Tinnitus and hearing loss are the two most prevalent service-connected disabilities for separating and retiring service members, as reported by Veterans Affairs (VA, 2020). Hearing injury can result in poor speech intelligibility, poor warfighter performance, and is often irreversible. Naval Medical Research Unit Dayton (NAMRU-Dayton) has a research portfolio dedicated to understanding contributors to auditory disabilities and mitigations to enhance force health protection.

Hazardous noise is traditionally considered the primary risk factor for hearing injury. However, substances called ototoxicants, which affect auditory, vestibular, and connected neural pathway function, are reported to be linked to hearing injury, both alone and in combination with noise. Extended duration noise exposure may also present hearing injury challenges. Military personnel assigned to U.S. Navy operational platforms commonly work shifts that last longer than 12 hours per day. When at sea, they work and live in close proximity to sources of hazardous noise. Since most exposure limits represent shorter timeframes and assume a recovery (rest) period exists during non-occupational exposure periods, little is known regarding the increased risk of hearing injury for extended durations of hazardous noise exposure.

Read more: https://www.news-medical.net/news/20201223/New-study-evaluates-how-different-face-masks-affect-the-acoustics-of-speech.aspx

Preventive Medicine

Miami Heat Opens Doors to Fans Thanks to COVID-Sniffing Dogs

Miami Heat fans were able to watch a basketball game in person for the first time since the pandemic shut down the NBA last March—in part thanks to dogs trained to detect COVID infections.

With the canine help, real life spectators streamed once more into American Airlines Arena in Miami before the game against the LA Clippers Thursday—though only 2,000 were allowed, or just 10 percent of the venue's capacity.

Read more: https://phys.org/news/2021-01-miami-doors-fans-covid-sniffing-dogs.html

New Study Identifies Bird Species That Could Spread Ticks and Lyme Disease

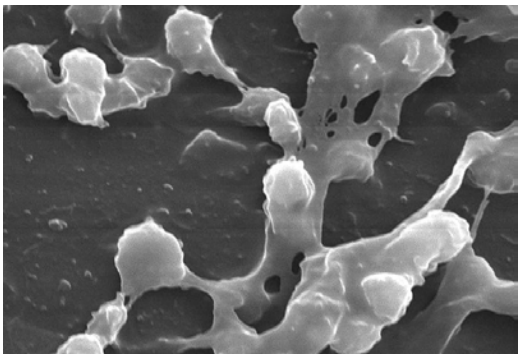
Birds play an underrecognized role in spreading tickborne disease due to their capacity for long-distance travel and tendency to split their time in different parts of the world—patterns that are shifting due to climate change. Knowing which bird species are able to infect ticks with pathogens can help scientists predict where tickborne diseases might emerge and pose a health risk to people.

A new study published in the journal Global Ecology and Biogeography used machine learning to identify bird species with the potential to transmit the Lyme disease bacterium (Borrelia burgdorferi) to feeding ticks. The team developed a model that identified birds known to spread Lyme disease with 80% accuracy and flagged 21 new species that should be prioritized for surveillance.

Read more: https://phys.org/news/2021-01-bird-species-lyme-disease.html

SMART Designs Tool to Investigate Bacteria Behind Hospital Infections

Researchers from the Antimicrobial Resistance (AMR) Interdisciplinary Research Group (IRG) at Singapore-MIT Alliance for Research and Technology (SMART), MIT's research enterprise in Singapore, and Nanyang Technological University (NTU) have developed a tool using CRISPRi technology that can help understand and prevent biofilm development, drug resistance, and other physiological behaviors of bacteria such as Enterococcus faecalis.



E. faecalis, a bacteria found in the human gut, is one of the most prevalent causes of hospital-associated infections and can lead to a variety of multidrug-resistant, life-threatening infections including bacteraemia (bloodstream infection), endocarditis (infection of the heart),

catheter-associated urinary tract infection and wound infections.

Read more: https://phys.org/news/2021-01-smart-tool-bacteria-hospital-infections.html

What You Need to Know About Double-Masking

To protect yourself from the new coronavirus variants, which are both more contagious and potentially more deadly than the original, some researchers and public-health experts now suggest that we all wear two masks simultaneously. When asked by Savannah Guthrie on NBC News' *Today* if doubling up on masks does a better job of blocking these new variants, National Institute of Allergy and Infectious Diseases director Dr. Anthony Fauci said it "likely does" and that "it just makes common sense that it would be more effective." According to Dr. Purvi Parikh, an immunologist with NYU Langone Health who was involved in two of the COVID-vaccine trials, "The more layers you have that increase the ply or the filtration of a mask, the better, because you're blocking more particles and droplets."

Read more: https://nymag.com/strategist/article/how-to-double-mask-to-stop-covid.html

DOD Utilizes 3D-Printing to Create N95 Respirators in the Battle against COVID-19

In response to the COVID-19 global pandemic, the U.S. Army Medical Materiel Development Activity's Warfighter Expeditionary Medicine and Treatment Project Management Office, as part of the U.S. Army Medical Research and Development Command's Additive Manufacturing Working Group, has played an integral role in the ramped-up effort to produce N95 respirators for healthcare and frontline workers across the nation. As stated on the U.S. Food and Drug

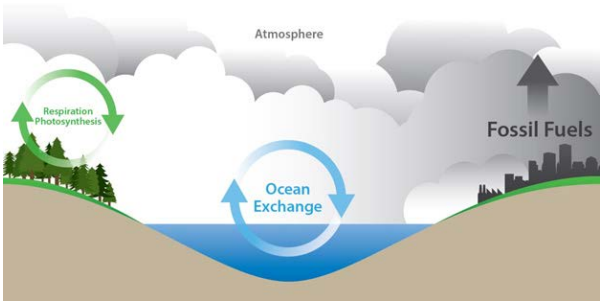
Administration's website, an N95 respirator is "a respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles." Compared to a surgical mask, which is loose-fitting, the edges of the N95 mask are

designed to form a very tight seal around the individual's nose and mouth, providing the highest levels of protection against infection from COVID-19.

Read more:
https://www.dvidshub.net/news/386849/dod-utilizes-3d-printing-create-n95-respirators-battle-against-covid-19

Environmental Health

Mouse Lung Structure and Function after Long-Term Exposure to an Atmospheric Carbon Dioxide Level Predicted by Climate Change Modeling



Background:
Climate change models predict that atmospheric carbon dioxide [CO_2] levels will be between 700 and 900 ppm within the next 80 y. Despite this, the direct physiological effects of exposure to slightly elevated atmospheric CO_2 (as compared with ~410 ppm experienced today), especially when exposures extend from preconception to adulthood, have not been thoroughly studied.

Objectives:
In this study we aimed to assess the respiratory structure and function effects of long-term exposure to 890 ppm CO_2 from preconception to adulthood using a mouse model.

Methods:
We exposed mice to CO_2 (~890 ppm) from prepregnancy, through the *in utero* and early life periods, until 3 months of age, at which point we assessed respiratory function using the forced oscillation technique, and lung structure.

Results:
CO_2 exposure resulted in a range of respiratory impairments, particularly in female mice, including higher tissue elastance, longer chord length, and lower lung compliance. Importantly, we also assessed the lung function of the dams that gave birth to our experimental subjects.

Read more:
https://ehp.niehs.nih.gov/doi/full/10.1289/EHP7305

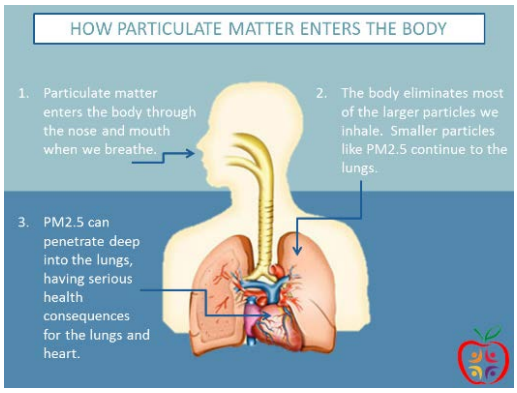
Air Pollution Linked to Increased Mental Health Outpatient Visits

More pollution in the air could be linked to higher rates of mental health service utilization, researchers at the Yale School of Public Health found in a new study.
The findings, which were recently published in the journal *Environmental Research*, stem from nearly six years of outpatient visits data collected at two major hospitals in Nanjing, China — a heavily polluted major city in China. After comparing the numbers with the amount of particulate matter found in the air every day, researchers discovered that visits were generally higher when the air quality was particularly poor.
More research is needed to fully understand why — and how — air quality impacts the rate at which mental health services are used. But according to YSPH Assistant Professor Sarah Lowe, Ph.D., who

was the first author of the study, the findings underscore the need for further investments in mental health services when air pollution gets worse.

Read more:
https://medicine.yale.edu/news-article/29809/

NO_2 and $PM_{2.5}$ Exposures and Lung Function in Swiss Adults: Estimated Effects of Short-Term Exposures and Long-Term Exposures with and without Adjustment for Short-Term Deviations



Outdoor air pollution is one of the most important risk factors for respiratory and other chronic diseases, and was estimated to contribute to 3.3 million premature deaths worldwide in 2010 (Lelieveld etal. 2015; Sun and Zhu 2019). Monitoring and reducing the key sources of outdoor air pollution is a high priority for the World Health Organization (WHO 2016). Nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$, particulate matter with an aerodynamic diameter ≤2.5 microns) has

been identified as an important pollutant that can penetrate into the lungs and trigger an inflammatory response (Dauchet et al. 2018; Weinmayr et al. 2010; WHO 2016).

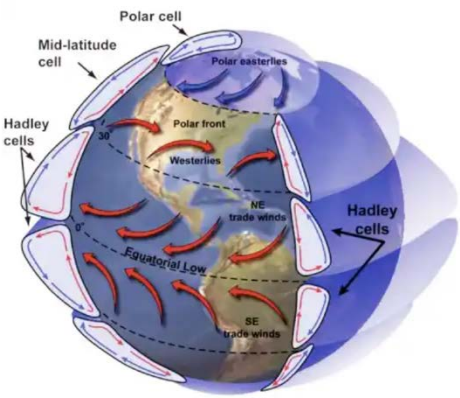
Studies investigating the impact of outdoor air pollution on lung function have focused mainly on the effect of short-term exposures, for example, air pollutant concentrations up to 7 days prior to a pulmonary function test (PFT) (Dauchet et al. 2018; Panis et al. 2017; Rice et al. 2013; Schindler et al. 2001), or on long-term exposures, such as annual mean concentrations (Ackermann-Liebrich et al. 1997; Adam et al. 2015). Although the evidence for adverse long-term effects of air pollution on lung function is strong in children and adolescents, evidence is still weak for the adult general population (Götschi et al. 2008).

Read more: https://ehp.niehs.nih.gov/doi/10.1289/EHP8671

U.S. Must Unify Atmospheric Biology Research or Risk National Security, Scientists Say

Global circulating winds can carry bacteria, fungal spores, viruses and pollen over long distances and across national borders, but the United States is ill-prepared to confront future disease outbreaks or food-supply threats caused by airborne organisms, says a new paper published in the Ecological Society of America's journal *Ecological Applications*.

Claire Williams, the paper's primary author and a research professor at American University, has spent decades studying long-range transport of tree pollen. Her early findings led to collaborations with German and Russian scientists who conducted a wide range of research—on forest genetics, atmospheric chemistry and



climate change—all under the unifying theme of atmospheric biology.

Read more: https://phys.org/news/2021-01-atmospheric-biology-national-scientists.html

Ergonomics

Scientists Identify Animal Model to Study Human Musculoskeletal Aging!

There are many components to aging, both mental and physical. When it comes to the infrastructure of the human body - the musculoskeletal system that includes muscles, bones, tendons and cartilage - age-associated decline is inevitable, and the rate of that decline increases the older we get. The loss of muscle function -- and often muscle mass -- is scientifically known as sarcopenia or dynapenia.

For adults in their 40s, sarcopenia is hardly noticeable -- about 3% muscle mass is lost each decade. For those aged 65 years and older, however, muscle decline can become much more rapid, with an average loss of 1% muscle mass each year. More importantly, sarcopenia is also marked by a decrease in strength, impaired gait, reduced physical activity, or difficulty completing everyday tasks.

Read more: https://www.news-medical.net/news/20210114/Scientists-identify-animal-model-to-study-human-musculoskeletal-aging.aspx

Home Working Linked to Rise in Musculoskeletal Disorders

According to analysis of data compiled by THOR-gP by health and safety consultants Arinite, keyboard work was the third biggest cause of MSDs, responsible for 11.3% of cases, behind heavy lifting (27.8%) and materials manipulation (19.4%).

Arinite attributed the rise in work-related MSDs to the increase in employees working from home – where their equipment may

not be sufficiently set up – during lockdowns. In 2019, 5.1% of workers mainly worked in their own home, but this increased to 46.6% last year, according to the Office for National Statistics.

Read more:
https://www.personneltoday.com/hr/home-working-linked-to-rise-in-musculoskeletal-disorders/

Safety

Factors Influencing the Filtration Performance of Homemade Face Masks

The outbreak of the COVID-19 pandemic is causing a shortage of personal protective equipment (PPE) across the world. As a public health response to control the pandemic, wearing homemade face coverings has been proven as a resort to protect both the wearer and others from droplets and aerosols transmission. Although aerosols and droplets can be removed through these non-medical materials with a series of filtration mechanisms, their filtration performances have not been evaluated in detail. Moreover, many factors, such as the fabric properties and the method of usage, also affect filtration performance. In this study, the size-dependent filtration performances of non-medical materials as candidates for face coverings were evaluated comprehensively. The flow resistance across these filter materials, an indicator of breathability, was also examined. The effect of materials properties, washing and drying cycles, and triboelectric effect on particle filtration was also studied. Results showed that the filtration efficiency varied considerably from 5–50% among fabrics materials due to the material properties, such as density and microscopic structure of the materials. Microfiber cloth demonstrated the highest efficiency among the tested materials. In general, fabric materials with higher grams per square meter (GSM) show higher particle filtration efficiency. The results on washing and drying fabric materials indicated decent reusability for fabric materials. The triboelectric charge could increase the filtration performance of the tested fabric materials, but this effect diminishes soon due to the dissipation of charges, meaning that triboelectric charging may not be effective in manufacturing homemade face coverings.

Read more: Journal of Occupational & Environmental Hygiene, Published online: 21 Jan 2021(Available with AIHA membership)

Reports Detail Pediatric Eye Injuries Related to Hand Sanitizer

As the pandemic has made hand sanitizer ubiquitous, perhaps it was inevitable that clinicians would report sanitizer-related eye injuries in children. Two brief studies published yesterday in *JAMA Ophthalmology* look into this topic, with the first finding a sevenfold year-to-year increase in sanitizer/eye exposure in French children from April to August, and the second looking at two cases of toxic keratopathy (cornea injury).

Overall, less chemical eye splatter cases were reported to the French Poison Control Centers from April to August 2020 than in the same months the year prior (2,336 [2.2% of pediatric calls] vs 2,553 [4.2%]), according to the first study. Cases in which the affected child was exposed to hand

sanitizer, however, rose from 1.3% to 9.9%. The frequency of these cases occurring in public locations also increased, both year-to-year (0 to 63) and from May to August 2020 (16.4% to 52.4%).

Read more:
https://www.cidrap.umn.edu/news-perspective/2021/01/news-scan-jan-22-2021

Prevent Struck-by Incidents at Crash Scenes

A new NIOSH infographic Prevent Struck-by Incidents at Crash Scenes pdf icon provides injury prevention recommendations for law enforcement officers. Officers can lower their risk external icon of being struck by a passing car while outside their patrol vehicles. Find more information in the NIOSH law enforcement motor vehicle resources webpage.

Read more:
https://www.cdc.gov/niosh/enews/enewsv18n9.html#a

Hot Filling Hazards with SCBA Air Cylinders

The National Institute for Occupational Safety and Health (NIOSH) Fire Fighter Fatality Investigation and Prevention Program (FFFIPP) monitors issues related to self-contained breathing apparatus (SCBA). The NIOSH FFFIPP has identified a potential hazard associated with rapid filling of compressed breathing air cylinders and the associated latent pressure/breathing time loss. Rapidly filling a breathing air cylinder, also known as "hot filling," generates excessive heat and can result in a loss of pressure as the cylinder cools leaving the user with reduced breathing air. Fire departments should ensure that cylinders are stored fully charged to maximize use and capacity.

Read more: https://www.news-medical.net/news/20201223/Nasolaryngoscopy-hood-effectively-reduces-aerosol-exposures-to-patients.aspx

RNAi-Based Products: A Sustainable Alternative to Hazardous Pesticides

RNAi-based biocontrol is a great alternative to hazardous pesticides and can contribute towards reversing the alarming decline in farmland birds and beneficial insects (especially pollinating ones).

RNAi is a well-known natural biological process in most organisms (plants, fungi and animals, including humans) that is based on RNA molecules. By creating technology based on this process, it is possible to protect crops and animals from a specific disease or pest.

Read more: https://phys.org/news/2021-01-rnai-based-products-sustainable-alternative-hazardous.html

Emergency Preparedness

Domestic Violence Soars after Natural Disasters. Preventing It Needs to Be Part of the Emergency Response

Domestic and family violence soars in the months and years following natural disasters. It usually involves physical and psychological violence perpetrated by men against women and children, but it can also include an escalation in sexual, financial and emotional abuse.

Following the 2009 Victorian Black Saturday bushfires, more than half of women in one study reported experiencing domestic and family violence. Many had never experienced it before.

Recent research found significant differences in reports of violence amongst women in high, medium and low bushfire affected regions in Victoria three years after

the Black Saturday bushfires. There was an overrepresentation of women experiencing violence in high bushfire affected areas.

Read more:
https://www.preventionweb.net/news/view/75697

Deployment Health

9 Of 11 Poisoned Fort Bliss Soldiers Released From Hospital

Nine of the 11 Fort Bliss soldiers sickened last week after drinking a component commonly found in antifreeze have been released from a Texas hospital, Army officials said Monday.

Two soldiers remained hospitalized at William Beaumont Army Medical Center in

El Paso, including one who is in intensive care, Fort Bliss officials said in a statement.

All 11 soldiers fell ill Thursday following a 10-day field training exercise at Fort Bliss's McGregor Range Complex, the base said. Initially, base leadership said the soldiers had ingested an unauthorized substance.

Read more:
https://www.armytimes.com/news/your-army/2021/02/02/9-of-11-poisoned-fort-bliss-soldiers-released-from-hospital/

Nanotechnology

Wearable Sensor Monitors Health, Administers Drugs Using Saliva and Tears

A new kind of wearable health device would deliver real-time medical data to those with eye or mouth diseases, according to Huanyu 'Larry' Cheng, Dorothy Quiggle Career Development Professor in the Penn State Department of Engineering Science and Mechanics (ESM).
Cheng recently published a paper in *Microsystems & Nanoengineering* on new micro- and nano-device technology that could revolutionize how certain health conditions are monitored and treated.

Read more:
https://www.eurekalert.org/pub_releases/2021-02/ps-wsm020121.php

Regulatory Research & Industrial Hygiene Professional News

Executive Order

OMB Issues Guidance on Executive Order Aimed at Protecting Federal Workers from COVID-19

The White House Office of Management and Budget has issued a guidance memo to support federal agencies in their effort to "develop tailored COVID-19 workplace safety plans," as required under an Executive Order signed Jan. 20 by President Joe Biden.

As an initial step in the implementation of the EO, titled Protecting the Federal Workforce and Requiring Mask-Wearing, OMB, along with the Safer Federal Workforce task force, is providing "model principles," or a starting point, for federal workplaces, which include:

- Allowing employees to work remotely when possible.
- Requiring the use of masks or facial coverings by employees, contractors and visitors.
- Limiting office capacity to 25%, unless it's "physically impossible" or "poses a threat to national security."

Read more:
https://www.safetyandhealthmagazine.com/articles/20780-omb-issues-guidance-on-executive-order-aimed-at-protecting-federal-workers-from-covid-19

FDA

FDA's NCTR Highlights Its Nanotechnology-Related Activities in 2020

The January 29, 2021, issue of the U.S. Food and Drug Administration's (FDA) *NCTR Research Highlights* includes an item highlighting the National Center for Toxicological Research's (NCTR)

nanotechnology-related activities in 2020. The activities include:

- **Nanotechnology Standards:** Two work items developed by the NCTR Nanotechnology Core Facility (Nanocore) staff became standards in February 2019 and January 2020 (Standard Practice for Performing Cryo-Transmission Electron Microscopy of Liposomes and Standard Test Method for Quantitative Measurement of the Chemoattractant Capacity of a Nanoparticulate Material *in vitro*, respectively) and are available through ASTM International. Seven additional work items developed by the NCTR Nanocore scientists are going through the consensus-standard process at ASTM International E56 for quality assurance and testing for biocompatibility;

Read more: https://www.natlawreview.com/article/fda-s-nctr-highlights-its-nanotechnology-related-activities-2020

NIOSH

NIOSH Report Details Dangers of Carbon Dioxide in Confined Spaces

The report details the investigation into a West Virginia couple's unexplained maladies -- from blurred vision to breathlessness to "episodic mild confusion" -- that authorities now believe stemmed from heightened carbon dioxide levels in the couple's finished basement and its adjacent crawlspace.

Perhaps the most chilling accounts were those describing a rush of air when the door to the crawlspace was opened.

Read more:
https://www.ehstoday.com/archive/article/21909755/niosh-report-details-dangers-of-carbon-dioxide-in-confined-spaces

OSHA

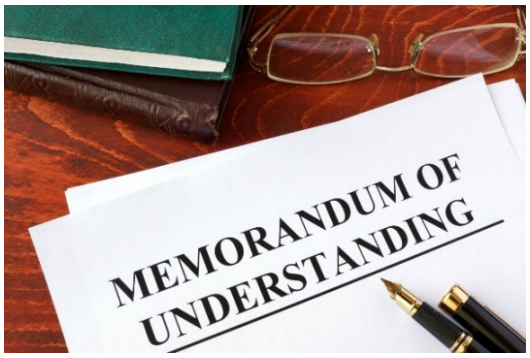
e-Specific Inspection Directive Targets Workplaces with Highest Injury and Illness Rates

Increased enforcement of workplace safety and health regulations is on the horizon and it will not be all about COVID-19. In December, the U.S. Department of Labor updated the Occupational Safety and Health Administration's (OSHA) Site-Specific Targeting (SST) Directive inspection program, emphasizing recordkeeping requirements.

Additionally, over the past several years, the number of compliance safety and health officers at OSHA decreased. This might change with a new Democrat-controlled Congress and a bigger budget for OSHA that can translate into hiring more compliance safety and health officers to conduct more inspections.

Read more:
https://www.natlawreview.com/article/new-osha-site-specific-inspection-directive-targets-workplaces-highest-injury-and

EPA and OSHA Sign MOU Regarding EPA's Review of New Chemicals under TSCA



The U.S. Environmental Protection Agency (EPA) announced on January 12, 2021, that it signed a memorandum of understanding (MOU) with the Occupational Safety and Health Administration (OSHA) "that advances collaboration and communication on EPA's review of new chemicals under the Toxic Substances Control Act (TSCA)." The goal of the MOU is to improve the combined efforts of the agencies to protect workers who may be exposed to a new

chemical substance by providing guidelines for coordination of interface activities between the two agencies, specifically communication as it relates to TSCA Section 5, with the common goal of minimizing workplace exposures. The MOU will remain in effect for three years.

Read more:
https://www.natlawreview.com/article/epa-and-osha-sign-mou-regarding-epa-s-review-new-chemicals-under-tsca

EPA

Revival of the General Duty Clause

In a somewhat surprising decision issued at the end of 2020, U.S. EPA ruled that Section 112(r)(1) of the Clean Air Act, better known as the "General Duty Clause," requires facilities to implement the latest industry practices in order to minimize the potential for accidental releases. Given this decision, and in anticipation of future inspections or regulatory inquiries, facilities should review, update, and document their programs for meeting the General Duty Clause requirements.

Read more:
https://www.natlawreview.com/article/revival-general-duty-clause

EPA Releases Final Risk Evaluation For 1,4-Dioxane

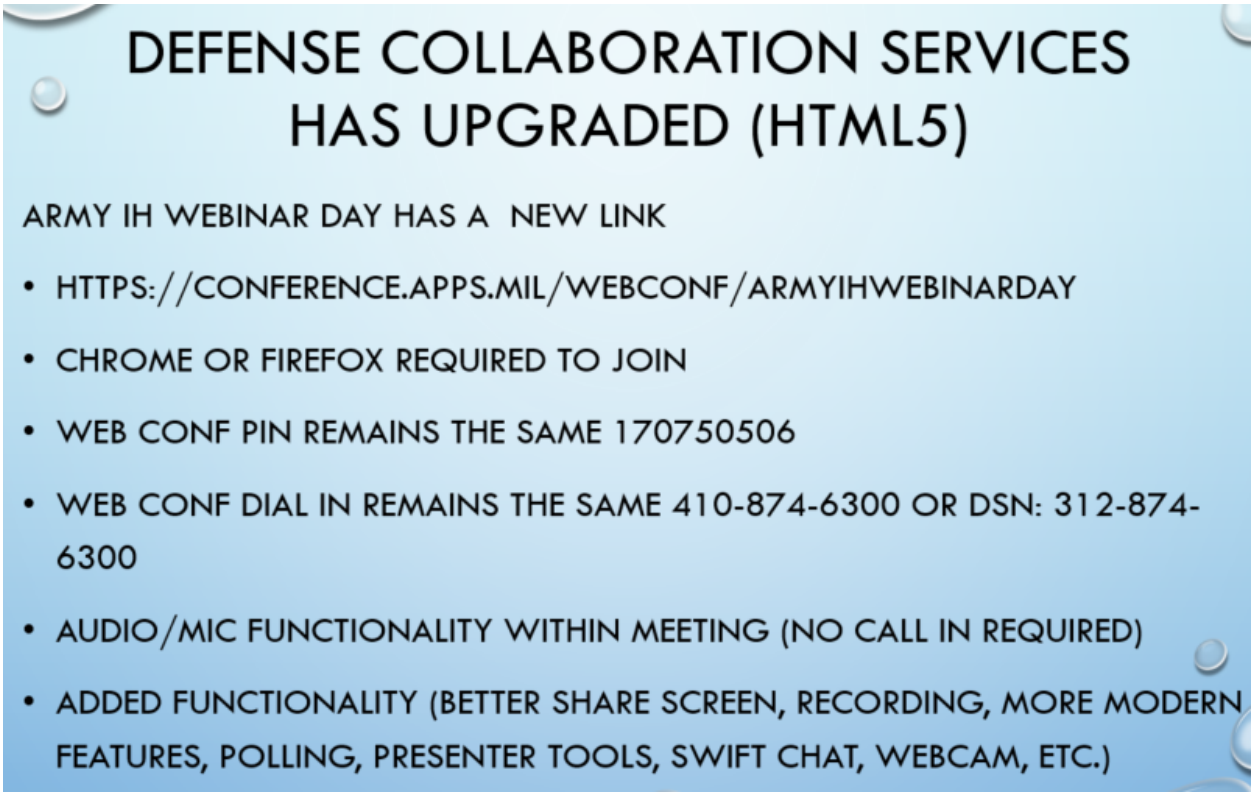
The potentially carcinogenic chemical substance 1,4-dioxane presents an unreasonable risk to workers under certain conditions, according to a final risk evaluation recently released by the Environmental Protection Agency, which is now compelled to propose within one year regulatory action to mitigate the chemical's hazards.

Often used in consumer products, 1,4-dioxane is among the first 10 chemicals under evaluation for potential health and environmental risks under the Frank R. Lautenberg Chemical Safety for the 21st Century Act.

Read more: https://www.safetyandhealthmagazine.com/articles/20790-epa-releases-final-risk-evaluation-for-14-dioxane

APHC

Training



2021 QUARTERLY ARMY IH WEBINAR DAY

HTTPS://CONFERENCE.APPS.MIL/WEBCONF/ARMYIHWEBINARDAY

12/2/2020	Monster	Building Downdraft Tables in DOEHRS-IH	Steven
12/2/2020	Leader	Measuring Downdraft Ventilation	Belden
12/2/2020	SME	Downdraft Ventilation Q/A	Belden
12/2/2020	SME	DOEHRS-IH Report Standardization	Delk
12/2/2020	Leader	Compressed Air use with Heavy Metals	Hueth
3/3/2021	**Leader**	**Vehicle Maintenance Shop Design Reviews**	**Parks**
3/3/2021	**Monster**	**Building Vehicle Exhaust in DOEHRS-IH**	**Steven**
3/3/2021	**Leader**	**Measuring Vehicle Exhaust**	**Parks**
3/3/2021	**SME**	**Vehicle Exhaust Q/A**	**Parks**
3/3/2021	**SME**	**Vehicle Exhaust Ototoxins Q/A**	**Merkley**
6/2/2021	Monster	Building Drive-in/Drive-through Paint Booths in DOEHRS-IH	Steven
6/2/2021	Leader	Measuring Drive-in/Drive-through Paint Booths	Belden
6/2/2021	SME	Drive-in/Drive-through Paint Booth Q/A	Belden
6/2/2021	SME	Letterkenny Paint booth incident/accident	Wisniewski
9/1/2021	**Monster**	**Building Dilution Ventilation in DOEHRS-IH**	**Steven**
9/1/2021	**Leader**	**Measuring Dilution Ventilation**	**Parks**
9/1/2021	**SME**	**Dilution Ventilation Q/A**	**Parks**
9/1/2021	**SME**	**Sampling Qualifiers**	**Secrest**

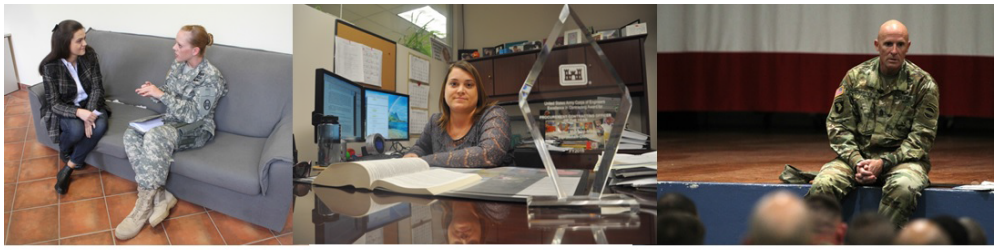
This monthly summary is published by the Industrial Hygiene Program Management Division for the Army Public Health Center.

POINTS OF CONTACT:

By Email:
ihnews@amedd.army.mil

By Phone or FAX:
Office: (410)436-3161
FAX: (410)436-8795

On the Web:
http://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/default.aspx



Professional Development and Career Programs

For Army Industrial Hygienists and Industrial Hygiene Technicians, Professional Development is through the Army Safety and Occupational Health (SOH) Career Program, known as Career Program 12 (CP-12).

Career Programs were established to ensure there is an adequate base of qualified and trained professional, technical, and administrative personnel to meet the Army`s current and future needs.

Planned training and development are essential elements to building a successful career.