

HTIS

Hazardous Technical Information Services

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DLA Aviation Now Offers Customers Bio-based Penetrating Lubricants

By DLA Aviation Public Affairs Office

Defense Logistics Agency Aviation Engineering has increased the availability and use of “green” products, by successfully introducing a new family of bio-based products into the federal supply system.

Engineers in the Hazardous Minimization and Green Products Branch collaborated with Aviation Supplier Operations’ Chemicals/Petroleum, Oils and Lubricants / Gases Integrated Supplier Team to provide qualified, less hazardous products for everyday use by our military service customers.

“DLA Aviation is the integrated material manager for chemicals, petroleum and industrial gases and is responsible for supplying these commodities to the entire federal government,” said Stephen Perez, management analyst, Hazardous Minimization and Green Products Branch.

Last July, DLA Aviation joined with the National Defense Center for Energy and Environment (NDCEE) and together initiated dialogue with Fort Jackson, S.C., and Joint Base Charleston, S.C. to demonstrate the effectiveness of a bio-based alternative to petroleum-based penetrating lubricants used previously.

In This Issue:

- DoT News..... 2
- Environmental News..... 4
- Occupational Safety & Health News..... 8

PHMSA Enhances Enforcement Authority Procedures

By Abdul H. Khalid, Chemical Engineer, HTIS

The Hazardous Materials Transportation Safety and Security Reauthorization Act of 2005 authorizes the Secretary of Transportation to inspect and investigate, at a reasonable time and in a reasonable manner, records and property relating to shipments that may contain hazardous materials, and to enforce hazardous materials regulations (HMR), as they pertain to DoT.

On March 2, 2011, the Pipeline Hazardous Materials Safety Administration (PHMSA) issued a final rule that authorizes DoT inspectors to use enhanced inspections, as well as investigative and enforcement authority to issue emergency orders addressing unsafe conditions or practices posing an imminent hazard necessitating other emergency measures. With respect to the rule, U.S. Transportation Secretary Ray LaHood said, "Safety is the Department's number one priority, and this rulemaking will give our inspectors the tools they need to ensure hazardous materials are packaged correctly and reach their destination safely". This final rule became effective on May 2, 2011.

Under this rule, the DoT inspectors have the authority to investigate any shipment that contains hazardous materials irrespective of the transportation mode, and to take necessary enforcement actions against companies that ship hazardous materials in unsafe conditions. The rule applies to the DoT's inspectors in PHMSA, the Federal Aviation Administration (FAA), Federal Motor Carrier Safety Administration (FMCSA), and Federal Railroad Administration (FRA).

The US Coast Guard (CG) may use these procedures when enforcing regulations relating to the shipment of hazardous material by water, if authorized by the Department of Homeland Security (DHS), since the USCG is now under the DHS.

PHMSA specifies procedures under which inspectors will gain access to open, and examine a package offered for or in transportation, if they have "reason to believe" that the package contains hazardous material.

This rule provides for more safety, will reduce the number of shipments of undeclared hazardous materials, and reduce the number of shipments that do not meet hazardous materials regulations. Each year, about 3 billion tons of hazardous materials that follow packaging and labeling protocols specified in the hazardous materials regulations are transported in the United States without incidents.

Department inspectors are also authorized to detain a shipment for up to 48 hours if they believe that a particular package might

"Penetrating lubricants are chemicals designed to lubricate moving parts on equipment susceptible to rusting," said Calvin Lee, Chief, Hazardous Minimization and Green Products Branch. "Petroleum-based products commercially available include WD-40 and Liquid Wrench. Although bio-based alternatives are also available commercially, none had been tested and demonstrated for DoD use until now."

Multiple executive orders and the Farm Security and Rural Investment Act mandate the use of green and/or bio-based products in an effort to reduce our country's dependence on petroleum-based products. Bio-based products are made from U.S.-grown renewable feedstock such as soybean, corn and sunflower oils that can be made into a variety of products such as lubricants and industrial fluids, Lee said.

DLA Aviation and NDCEE performed an in-depth comparative analysis of bio-based items to determine if they would meet DoD performance requirements. For penetrating lubricants, DoD Standard A-A-50493B (Oil, Penetrating (For Loosening Frozen Metallic Parts)) outlines the basic criteria that any bio-based product would have to meet.

After careful examination, two commercial bio-based products (Environmental Logic 38 and Bio-Blast) met the specification requirements on paper.

Using the petroleum-based product as a baseline, the two bio-based products' performance results were compared on latches, hood access pins, bolts and tow hooks on Light Armored vehicles, road graders, dump trucks, Humvee and equipment at Joint Base Charleston, S.C.

Lee said that members of the U.S. Army Tank-Automotive and Armaments Command at Fort Jackson and the U.S. Air Force 628th Logistics Readiness Squadron and 437th Maintenance Group – Aircraft Ground Equipment at Joint Base Charleston agreed to participate in the demonstration of the apparently qualified bio-based products. The tests were conducted for approximately 90 days at both locations. Measures of merit included whether the product loosened rusted bolts; appeared to provide protection from corrosion; the amount of product used and ease of use.

In almost every case, the bio-based products performed as well or better than the baseline petroleum-based product. Based on military service users' recommendations, National Stock Numbers were sought in late 2010 and granted in January 2011. The new bio-based penetrating lubricant NSNs are 9150-01-591-4213/4274/4281/4247. These products are now readily available.

"New item demonstration projects such as bio-based penetrating lubricants illustrate clearly how the branch is implementing DLA Aviation's vision for "Greening DoD," Lee said. "Our mission is to increase the availability and ease of ordering green products in the Aviation Demand and Supply Chain and by that barometer we are well on our way."

pose a serious threat to life, property or the environment. If a package is found to pose an imminent hazard, the inspector has the authority to order that the package be taken to a facility for further analysis. If a particular package is deemed to pose a serious threat to life, property or the environment, it can be taken "out of service" until it complies with hazardous materials regulations. However, if a particular package is detained, the rest of the shipment may continue in transit. In addition, the final rule allows PHMSA, the FAA, the FMCSA, or the FRA to issue an emergency order if they determine that a noncompliant shipment is causing an imminent hazard. The order could be issued in conjunction with or in place of an out-of-service order.

PHMSA needs to distinguish between conditions that are created by the shipper of hazardous materials versus those created by the carrier. Under the rule, the shipper, not the carrier, should be penalized for improperly packaging and labeling a hazardous material shipment.

For additional information on this rule, DoD personnel can contact:

- **U.S. Department of Transportation
PHMSA**
Washington, D.C.
PH: 202.366.4433
FX: 202.366.3666

Or, Visit the DoT/PHMSA Website at:

- <http://www.phmsa.dot.gov>

References:

1. DoT News: PHMSA 03-11, March 1, 2011, "U.S. Department of Transportation Announces New Rule to Make Shipping of Hazardous Materials Safer", website at: <http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/phmsa0311.pdf>.
2. Federal Register: March 2, 2011, Vol. 76, No. 41, pages 11569-11595; website at: <http://edocket.access.gpo.gov/2011/2011-4270.htm>

Transportation of Used Batteries for Disposal

By Philip Saunders, Chemical Engineer, HTIS

The Department of Defense (DoD) requires that batteries that are used, spent or declared excess be turned in to the Defense Logistics Agency (DLA) Disposition Services for treatment and disposal, recycling or sale, unless their disposal is managed locally. When batteries are shipped for this purpose, they must comply with applicable Federal transportation and environmental regulations, and must also be packaged according to DoD policies, otherwise, they will be in violation of Federal regulations, and will not be accepted by DLA Disposition Services.

The DoD has different requirements for used batteries that are classified as a hazardous waste from those that are not classi-

fied as a hazardous waste. Prior to shipping a used battery, the battery must be properly classified. The Environmental Protection Agency (EPA) regulates the disposal of batteries classified as hazardous waste since they contain chemicals that can be hazardous to the environment if improperly managed. According to 40 CFR 273.2, under the Resource Conservation and Recovery Act (RCRA), most used batteries that are declared to be a waste, will be classified as a "universal waste". The main exception to this rule, as noted in 40 CFR 266.80, is that spent lead acid batteries that are to be reclaimed or regenerated and eventually reused, are not required to be classified as a universal waste, and instead will be classified as a "hazardous material", along with unused batteries. Ultimately, the decision to classify a battery as a hazardous waste or as a hazardous material depends on factors such as the chemistry used in the battery, the condition of the battery, and its intended fate.

In addition to being a potential environmental hazard, batteries can be a hazard during transportation due to the chemicals contained within the battery, as well as due to the potential for electrical discharge and fires. Because of this, shippers of used batteries must comply with the applicable regulations promulgated by the Department of Transportation (DoT) in 49 CFR. Since used or spent batteries are not typically shipped by air or water, except in military operational theaters, battery transportation requirements from other transportation regulatory activities, such as the International Air Transporters Association (IATA) and the International Maritime Organization and their International Maritime Dangerous Goods (IMDG) Code, are not considered in this article.

In 2009, the DoT issued a safety compliance advisory letter outlining three common safety violations seen with shipments of spent or used batteries:

- 1. Batteries that are co-mingled and unsecured within a package:** This is an issue because unsecured batteries can be more easily damaged than when they are properly secured and protected. More importantly, packages containing co-mingled incompatible batteries that are damaged enough to leak their internal contents can cause dangerous chemical reactions that can generate heat or produce chemicals that are toxic or flammable.
- 2. Packages that do not indicate they contained batteries:** Marking a package that contains batteries, or including relevant information on shipping documents accompanying the package, is important because shippers and emergency responders need to be aware of the presence of the potential hazards associated with batteries contained within a shipment.
- 3. Batteries not packaged to prevent short circuits:** All batteries should be packaged for transportation in such a way that short circuits are prevented. In most cases, the original packaging (blister packs and rigid boxes) adequately performs this function, but this issue is more common with used batteries because the original packag-

ing is usually discarded when the battery is installed. DoT describes two methods for preventing short circuits in shipments of used batteries, either of which may be used:

- a. Physical separation with a fully enclosing, non-conductive material (such as a plastic Ziploc bag); or
- b. Using a nonconductive tape to cover the battery terminals in order to prevent physical contact with exposed terminals.

Another consideration when shipping batteries is the assignment of a proper shipping name to the battery. New or unused batteries having certain chemistries and/or configurations are not subject to the hazardous materials regulations, or are excepted from most of the packaging, marking and labeling requirements applicable to batteries that are fully regulated for transportation. However, once the battery is classified as a hazardous waste (Nickel Cadmium, Lithium, or Lead Acid), it is subject to the hazardous materials transportation regulations as an "environmentally hazardous substance". When a new battery is fully regulated for transportation, but is declared to be a waste, then the original proper shipping name should be used with the word "waste" added to the description.

In addition to complying with DoT requirements, there are DoD regulations established internally that are applicable to these batteries. Used, spent, or excess batteries that are to be sent to DLA Disposition Services must also comply with the additional packaging requirements as described in DoD 4160.21-M, *Defense Materiel Disposition Manual*, (REF: Chapter 10, Environmentally Regulated and Hazardous Property). Chapter 10, attachment 1, "Special Turn-In Requirements", includes the DoD packaging requirements as applicable to batteries that are sent to DLA Disposition Services. In addition, the Army has issued a technical bulletin, TB 43-0134, *Battery Disposition and Disposal*, that provides guidance and requirements applicable to Army managed batteries. These requirements may be more stringent than those required by DoD, DoT and the EPA, but not less.

Many of the packaging requirements found in documents such as DoD 4160.21-M and TB 43-0134 match those found in DoT regulations, but some are more explicit, in terms of packaging instructions or describe the documentation that is required for a battery to be turned in. For example, those documents require that batteries be securely packaged and protected against short circuits. They also prohibit commingling of incompatible batteries. Both documents require that used batteries turned in as a hazardous waste or a universal waste have either a Hazardous Waste Profile Sheet (HWPS) or a Material Safety Data Sheet (MSDS). If the battery is turned in as a hazardous material rather than as a hazardous waste, then a MSDS should be included, if one is available. DoD 4160.21-M also provides special classification and packaging instructions that are specific to particular battery chemistries (i.e., lead acid, lithium sulfur dioxide, thermal, etc.). Also note that the DoD manual prohibits shipment of leaking batteries, or batteries that are not secured on a pallet or secured inside a container.

The shipment of used batteries can be complex, but the generator/shipper needs to be vigilant when it comes to protecting the environment and avoiding transportation accidents that may cost lives, cause destruction of government property, and result in fines due to regulatory violations. Prior to every shipment of used batteries, one should ensure that they are properly segregated, secured and protected against short circuit, as well as classified properly and packaged according to DoD requirements applicable to that specific battery and waste classification. Careful interpretation of the regulations for each specific situation will ensure that batteries are shipped without incident.

References:

1. DoT, Battery Safety Compliance Advisory Letter, April 3, 2009; http://www.phmsa.dot.gov/staticfiles/PHMSA/Downloadable-Files/Files/2009_Battery_Safety_Compliance_Advisory.pdf
2. DoD 4160.21-M, "Defense Materiel Disposition Manual", August 18, 1997
3. Electronic Code of Federal Regulations, Titles 40 & 49, <http://www.gpoaccess.gov/ecfr/index.html>
4. EPA Website, "Universal Wastes", <http://www.epa.gov/epa-waste/hazard/wastetypes/universal/index.htm>
5. TB 43-0134, *Battery Disposition and Disposal*, Department of the Army, May 19, 2008.

Environmental News

NIOSH Alert on Beryllium

By Beverly Howell, Industrial Hygienist, HTIS

Pure beryllium is one of the lightest metals known. It is a hard, grayish material that is obtained from the minerals bertrandite and beryl. Gem-quality beryl is either aquamarine or emerald in color. But a dark side of the metal is the fact that beryllium is highly toxic, and its toxic effect has led to reports of health and environmental concerns. Addressing these concerns is driving up the cost of producing beryllium, and stimulating interest in the development of substitute materials. Since 1999, consumption has been declining, with electronics being the area most affected.

Beryllium has unique properties such as strength, electrical and thermal conductivity, and resistance to corrosion that makes the use of the metal and its oxide attractive in a wide range of technological applications. Although beryllium is a naturally occurring substance, the major source of its emission into the environment is the combustion of fossil fuels (primarily coal), that releases beryllium-containing particulates and fly ash into the atmosphere. Beryllium is relatively water insoluble and binds tightly in soil; therefore, it is not often a drinking

water contaminant. It has also been found in various foods, but bioaccumulation in the food chain is not significant.

The United States is one of only three countries known to process beryl ores and beryllium concentrates into beryllium products. Materion Corporation, formerly Brush Engineered Materials (BEM), extracts bertrandite from open pit mines near Delta, Utah, and converts the bertrandite, along with beryl, into beryllium hydroxide.

At the end of 2005, Materion reported proven bertrandite reserves in Utah of about 5.99 million dry metric tons. This represented about 16,000 tons of contained beryllium, an amount that is sufficient for more than 100 years of operations, based on average production levels in recent years. Thus, there is no shortage of the raw material.

Beryllium is or has been used in the following applications by the Department of Defense and commercially as noted in Table 1 below:

National Defense	Commercial
Airborne forward-looking infrared systems	Battery contacts and electronic connectors in cell phones and base stations
Guidance systems on existing strategic missiles	Aerospace castings
Surveillance, communications, and other satellites	High-definition and cable television
Missile defense systems	Underwater fiber-optic cable systems
Aircraft brakes	High-density circuits for high-speed computers and automotive ignition systems
Nuclear reactor rods and warheads	Pacemakers and other medical devices

TABLE 1. Uses of Beryllium

Workers exposed to particles, fumes, mists, or solutions from beryllium-containing materials may develop beryllium sensitization or chronic beryllium disease, a potentially disabling or even fatal respiratory disease.

The National Institute for Occupational Safety and Health (NIOSH) has issued an alert titled "Preventing Sensitization and Disease from Beryllium Exposure" in an effort to reduce or eliminate exposure.

NIOSH recommends that workers exposed to particles, fumes, mists, or solutions from beryllium-containing materials take the following steps to protect themselves:

- ☑ Understand the risks and follow all proper procedures for working with beryllium — including participation in safety training.
- ☑ Keep beryllium out of the lungs:
 - ✘ Make sure that beryllium dusts, fumes, mists, and beryllium-containing solutions and suspensions are controlled at their sources.
 - ✘ Participate in respiratory protection programs when advised to do so.
- ☑ Keep beryllium-containing dusts and solutions off the skin:
 - ✘ Keep work surfaces and work areas clean.

- ✘ Participate in skin protection programs. These programs may include wearing gloves, company-issued clothing with long sleeves and long pants, and showering at the end of the workday.

- ☑ Do not store or consume food, drinks, tobacco products, or cosmetics in beryllium work areas.
- ☑ Do not use cleaning methods that may cause dust to become re-suspended in air (e.g., dry sweeping, compressed air, and other dust-generating methods). Better methods include HEPA-filtered vacuums or wet cleaning methods that do not produce splash or spray.
- ☑ Prevent beryllium dusts and other contaminants from leaving beryllium work areas on your skin, clothing, shoes, and tools.
- ☑ Participate in workplace medical surveillance so that risks related to job tasks can be identified and prevented.

- ☑ Seek medical attention for any chronic cough or shortness of breath, which may indicate chronic beryllium disease.
- ☑ Seek medical attention for any rash or non-healing cut or wound.

NIOSH recommends that employers of workers exposed to particles, fumes, mists, or solutions from beryllium-containing materials take the following steps to protect workers, contractors, and visitors:

- ☑ Know the beryllium content of all materials in the workplace. The manufacturers or suppliers of materials containing greater than 0.1% beryllium are required to provide this information on Material Safety Data Sheets.
- ☑ Substitute less hazardous materials for those containing beryllium whenever feasible.
- ☑ Minimize the number of workers exposed to beryllium dusts, fumes, mists, and beryllium-containing solutions and suspensions.
- ☑ Install, use, and maintain effective engineering controls for processes that create beryllium dusts, fumes, mists, and beryllium-containing solutions and suspensions.
- ☑ Keep airborne concentrations of beryllium as low as possible, since a safe exposure limit for beryllium has not been determined.

- ☑ Monitor airborne beryllium concentrations to document the effectiveness of efforts to reduce airborne exposures.
- ☑ Inform workers about the risks of beryllium sensitization, chronic beryllium disease, and lung cancer, and the proper procedures for working with beryllium-containing materials.
- ☑ Keep beryllium dusts, fumes, mists, and beryllium-containing solutions and suspensions confined to the immediate work area.
- ☑ Do not use cleaning methods that may cause dust to become re-suspended in air, e.g., dry sweeping, compressed air, and other dust-generating methods. Better methods include HEPA-filtered vacuums or wet cleaning methods that do not produce splash or spray.
- ☑ Prevent beryllium dusts and other contaminants from leaving beryllium work areas on workers' skin, clothing, shoes, and tools.
- ☑ Identify and clean areas outside the beryllium work zone that may have become contaminated before these recommendations were implemented.
- ☑ Establish and maintain an appropriate respiratory protection program as needed.
- ☑ Establish and maintain a skin protection program to protect workers' skin from contamination with beryllium dusts and solutions:
 - ✎ Keep work surfaces and work areas clean.
 - ✎ Provide work gloves, long-sleeved shirts, long pants, and shoes that remain at the workplace.
 - ✎ Provide showering and changing facilities.
- ☑ Conduct medical surveillance for sensitization using the beryllium lymphocyte proliferation test for workers who come in contact with beryllium dusts, fumes, mists, and beryllium-containing solutions and suspensions:
 - ✎ Identify higher-risk jobs and processes to prioritize prevention efforts and evaluate their effectiveness in decreasing the risk of sensitization.
 - ✎ Ensure that sensitized workers identified through surveillance are referred for medical testing to:
 - ◆ Determine whether they have chronic beryllium disease,
 - ◆ Establish radiographic and lung function baselines for follow-up testing, and
 - ◆ Receive counseling.

When the above preventive measures are successfully implemented, they can help reduce the risk associated with beryllium and beryllium containing materials.

References:

1. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, NIOSH Alert, "Preventing Sensitization and Disease from Beryllium Exposure", DHHS Publication Number 2011-107, February, 2011.

2. The National Academies Press, Committee on Assessing the Need for a Defense Stockpile, National Research Council, "Managing Materials for a Twenty-first Century Military", 2008.

EPA Looks to Regulate — Perchlorate and Volatile Organic Chemicals

By Beverly Howell, Industrial Hygienist, HTIS

The US Environmental Protection Agency (EPA) Administrator, Lisa Jackson, has made improving the quality of drinking water a top priority for the EPA. This is evidenced by recent EPA developments in regulatory actions and guidance documents that are aimed at ensuring that Americans are protected against potential health impacts from drinking water, as well as ensuring the quality of potable water. Its focus is perchlorate as well as VOCs in water.

The decision to regulate perchlorate is the first time that the EPA has decided to regulate a substance from the Contaminant Candidate List, as required by the 1996 Amendments to the Safe Drinking Water Act. This decision reversed a 2008 preliminary determination, and considered input from almost 39,000 public comments. The science leading to this decision was peer reviewed by independent scientists, and public health experts including the National Academies of Science.

Perchlorate and the Department of Defense (DoD) have had a long history. The production of ammonium perchlorate started in the United States in the mid-1940s, primarily for use by the U.S. military. The most common uses of ammonium perchlorate are in explosives and military munitions such as mortars, grenades and flares, and solid fuel rockets. Based on production data from two perchlorate manufacturers, 90 percent of perchlorate compounds are manufactured for use in defense activities and the aerospace industry. While occurring most frequently at domestic Air Force installations, ammonium perchlorate has also been detected at Army and Navy sites. The National Aeronautics and Space Administration (NASA), and the Department of Energy (DOE) both have a small number of facilities that use perchlorates. In addition, ammonium perchlorate and the other perchlorate salts have been or are used in a wide range of applications, including pyrotechnics and fireworks, blasting agents, matches, lubricating oils, nuclear reactors, air bags and certain types of fertilizers. The improper storage and/or disposal related to the uses mentioned above are the most typical routes for perchlorate to enter into the environment.

Perchlorate interferes with the uptake of iodide into the thyroid gland. Because iodide is an essential component of thyroid hormones, perchlorate disrupts how the thyroid functions. In adults, the thyroid helps to regulate metabolism. In children, in addition to regulating metabolism, the thyroid plays a major role in proper development. The impairment of the thyroid function in pregnant women may impact the

fetus, resulting in such effects as changes in behavior, delayed development, and a decreased learning capability of the child. Drinking water contaminated with perchlorate is the most likely way that perchlorate is ingested.

Since there is no current federal standard for perchlorate in drinking water, some states have implemented their own standards. In Massachusetts, the Department of Environmental Protection has established a standard of 2 parts per billion as the acceptable level of perchlorate in drinking water (2006). This standard is currently being used by both the Air Force and Army conducting cleanup efforts at the Massachusetts Military Reservation.

More recently, the Office of Environmental Health Hazard Assessment (OEHHA) in California released a draft public health goal (PHG) of 1 part per billion (ppb) for perchlorate in drinking water. A public health goal is not an enforceable regulatory standard; its purpose is to provide scientific guidance to the California Department of Public Health (CDPH) in reviewing the existing state drinking water standard for perchlorate. The current state standard, officially known as a maximum contaminant level (MCL), is set at 6 ppb.

Studies conducted by the U.S. Department of Agriculture (November 2004) and the Environmental Working Group (April 2003) detected perchlorate in samples of lettuce in California. In 2009, the U.S. Centers for Disease Control and Prevention identified perchlorate in fifteen top-selling brands of powdered infant formula. Cow's milk-based formula with lactose had a significantly higher concentration of perchlorate than the other sources, i.e., basic soy. Based on the above CDC study and those that were conducted by others, it is evident that perchlorate contamination has made its way through the ecosystem.

The EPA is developing another regulation covering 16 volatile organic compounds (VOCs), that include trichloroethylene (TCE) and tetrachloroethylene (PCE), as well as other regulated and some unregulated contaminants that are discharged from industrial operations. The VOC standard will be developed as part of the EPA's new strategy for drinking water, which the EPA administrator announced in March 2010. A key principle of the strategy is to address contaminants as groups rather than individually, in order to provide public health protections more quickly, and to also allow utilities to more effectively and efficiently plan for improvements.

References:

1. Federal Register, Volume 76, Number 29, Environmental Protection Agency, Regulatory Determination, "Drinking Water: Regulatory Determination on Perchlorate", February 2, 2011.
2. Environmental Protection Agency, EPA Press Release, "EPA to Develop Regulation for Perchlorate and Toxic Chemicals in Drinking Water", February 2, 2011.
3. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Sacramento, California, Release, "OEHHA Proposes Revised Public Health Goal for Perchlorate", January 7, 2011.

Safer Chemicals — Healthier Families

By Beverly Howell, Industrial Hygienist, HTIS

The Occupational Safety and Health Administration (OSHA) was created during the 1970's in response to the increasingly grim statistics of on-job injury rates and deaths. OSHA developed standards to protect the rights of workers and to reduce the risk of injury or death in the workplace. When workers go to work, there is an assumption that they should return home protected from chemicals, air and noise pollution, trips, slips, falls and fire hazards.

But what happens when the hazards from which one needs to be protected are located in your home, and involve your children's toys or everyday household items? We have all become too familiar with public health concerns associated with drywalls that appear to emit sulfur gases that can damage air conditioning coils, electrical plumbing components and other material; toys that have been recalled because of lead in the paints; pet foods contaminated with melamine; or toothpaste containing diethylene glycol (DEG).

To protect public health, state legislators in at least 30 states plan to introduce legislation during the 2011 legislative sessions to better regulate toxic chemicals found in children's products and in everyday household items.

Most of the legislators, many of whom are members of the National Caucus of Environmental Legislators (NCEL), feel that they need to act because Federal laws are too weak or Congress has failed to keep certain toxics, such as bisphenol-A (BPA) and cadmium, out of products designed for kids.

The NCEL was organized in 1996 to provide environmentally progressive legislators with an opportunity to coordinate their activities with respect to national legislative organizations, and to share ideas both on affirmative and negative environmental issues.

If Federal efforts to reform the Toxic Substance Control Act (TSCA) remain stalled, it appears that state legislatures will continue to be the focus of debates over how to better regulate chemicals used in products designed for children, as well as everyday household items.

"Over the years, we've seen real leadership coming from the states and state legislators who understand the harm toxic chemicals can cause to human health, and each year, more and more states are looking for ways to get at these toxics, and legislators' interest in these issues will not go away anytime soon," said NCEL's Executive Director, Adam Schafer.

Below are the policies that the 2011 state legislatures are considering:

Comprehensive State Laws: Nine states, Connecticut, Illinois, Massachusetts, Michigan, Minnesota, New York,

Oregon, Washington and Vermont, will be introducing or have introduced policies to change the way we regulate chemicals at the state level.

BPA Phase Outs: At least 17 states, Connecticut, Hawaii, Idaho, Illinois, Iowa, Kentucky, Maine, Maryland, Massachusetts, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Texas and the District of Columbia will be introducing or have introduced policies to restrict the use of BPA in infant formula cans, receipt paper, baby bottles and/or sip cups.

State TSCA Resolutions: At least 11 states, Alaska, California, Delaware, Georgia, Iowa, Maine, Massachusetts, Montana, South Dakota, Texas and Wisconsin will be asking the 112th U.S. Congress to bring US Federal chemicals policy into the 21st century.

Banning Cadmium in Children's Products: At least eight states, Florida, Kentucky, Maine, Maryland, Michigan, Mississippi, New Jersey and New York will be introducing or have introduced policies to ban the use of cadmium in children's products.

Deca BDE (toxic flame retardant) Phase Outs: At least three states, Alaska, Massachusetts, New York and the District of Columbia will be introducing or have introduced policies to reduce exposure to deca BDE.

Legislation planned: Chemical safety legislation is also planned in South Dakota.

The Department of Defense's working groups, as well as environmental, safety and occupational health professionals are constantly monitoring developments in emerging contaminants and state legislative reforms to ensure that the human health of our military, as well as their dependents, is protected.

Reference: National Caucus of Environmental Legislators, Release, "At Least 30 States to Tackle Children's Health and Toxics in 2011", January 19, 2011.

Occupational Safety & Health News

OSHA to Adopt GHS Classification and Labeling of Chemicals

By Muhammad Hanif, Chemist, HTIS

This summer, the Occupational Safety and Health Administration (OSHA) is expected to announce that US employers must begin to adopt the United Nations (UN) Globally Harmonized System

(GHS) for the classification and labeling of hazardous chemicals. The promulgation of this regulation means that virtually every chemical label, Material Safety Data Sheet (MSDS) (soon to be called "Safety Data Sheet" (SDS)), and written hazard communication plan will have to be revised to meet the new standard. Worker training must also be updated so that workers can recognize and understand the symbols and pictograms on the new labels, as well as the new hazard statements and precautions on SDSs.

These dramatic changes will impact other OSHA standards that address, Flammable and Combustible Liquids, Process Safety Management (PSM), Hazardous Waste Operations and Emergency Response (Hazwoper), Fire Prevention and Protection, Occupational Exposure to Hazardous Chemicals in Laboratories, and many of the chemical-specific OSHA standards (e.g., Lead Standard). Both employers and employees will need to familiarize themselves with the GHS Standards by attending appropriate training that will enable them to comply with the new OSHA requirements.

The GHS for the Classification and Labeling of Chemicals is a worldwide initiative to promote standard criteria for classifying chemicals according to their health, physical and environmental hazards. It uses pictograms, hazard statements, and the signal words "Danger" and "Warning" to communicate hazard information on product labels and safety data sheets in a logical and comprehensive way. The primary goal of the GHS is better protection of human health and the environment by providing chemical users and handlers with enhanced and consistent information on chemical hazards. The following is a brief description of the three ways in which information will be communicated:

Pictogram(s): A symbol inside a diamond with a red border, denoting a particular chemical hazard class. The effectiveness of hazard communication is enhanced when important information is conveyed in more than one way, such as combining eye-catching symbols with clear label text. Pictograms are a simple method of conveying information and drawing attention to other label information. GHS uses pictograms in combination with the two distinct signal words to quickly and simply relay important hazard information to chemical users and handlers, e.g., acute toxicity/lethality, skin irritation/corrosion, etc). The Environmental Protection Agency (EPA) anticipates that five of the GHS pictograms will be the most commonly used on pesticide labels (e.g., skull and cross bones, exclamation mark, corrosion, flame, or environment). The complete set of GHS pictograms can be viewed on the United Nations GHS Web site (http://www.unece.org/trans/danger/publi/ghs/ghs_rev01/01files_e.html).

Hazard statement(s): A phrase assigned to each hazard category that describes the nature of the hazard. The hazard statement may be based on the UN's GHS standard or similar statements that would not conflict with the GHS standards. For example, the hazard statements "Harmful if swallowed", "Highly flammable liquid and vapor" and "Harmful to aquatic life" are based, in part, on current EPA requirements, and they are generally very similar.

Signal word(s): One word used to indicate the relative severity of hazards and alerts the reader to a potential hazard on the label and safety data sheet. The GHS includes two signal words:

“Warning” — or less severe hazard categories and;

“Danger” — for more severe hazard categories.

Lower categories of classification and unclassified products would not require pictograms or signal words under GHS. Currently, the EPA system includes a third signal word “Caution” that is used in addition to “Warning” and “Danger.”

The adoption of the GHS classification and labeling of chemicals or products will provide the following benefits:

Enhance the protection of human health and the environment: The consistent and widespread use of GHS will enhance protection of human health and the environment by providing an internationally comprehensible system for hazard communication. GHS will help ensure more consistency in the classification and labeling of all chemicals, thereby improving and simplifying hazard communication. This improved communication system will alert the user to the presence of a hazard and the need to minimize exposure and risk, resulting in safer transportation, handling and use of chemicals.

Promote sound management of chemicals worldwide: The GHS will provide a harmonized basis for the first step in the sound management of chemicals by identifying hazards, and communicating them. This will be particularly useful for countries without well-developed regulatory systems.

Facilitate Trade: The GHS will reduce costly and time-consuming activities needed to comply with multiple classification and labeling systems, thereby promoting more consistency in regulations while reducing non-tariff barriers to trade.

In the classification of a chemical hazard, the GHS specifies certain elements that should appear together on chemical labels. Similar to the current EPA pesticide labeling system, hazard statements, pictograms (symbols), and signal words may be required on pesticide or chemical product labels depending on the toxicity or hazards of the product, while precautionary statements, product identifiers, and supplier information are required on all labels. As some elements will change, OSHA, as well as the EPA recognizes that implementing the GHS will require extensive outreach, education and training to promote understanding of the new labels.

Changes associated with adopting the GHS’s chemical classification and labeling systems will not affect supplemental information (such as directions for use and additional hazard information), testing methods for health and environmental hazards, data requirements, the scope of hazards covered, policies governing the protection of Confidential Business Information (CBI), or risk management measures on labels used by the EPA, OSHA,

DoT or DoD, as long as the information does not contradict or detract from the GHS label information..

Additional information on GHS implementation may be obtained from the referenced websites.

For technical information, you may contact:

- **Ms. Maureen O'Donnell**
Directorate of Standards and Guidance, Room N-3718
OSHA
U.S. Department of Labor
200 Constitution Avenue, NW
Washington, D.C.
PH: 202.693.1950

References:

1. Federal Register, Vol. 74, No.188, Wednesday, September 30, 2009, page 50280-50549 (74FR50280): <http://www.gpo.gov/fdsys/pkg/FR-2009-09-30/pdf/E9-22483.pdf>
2. Chemical Hazard Classes: <http://www.epa.gov/oppfead1/international/ghs/hazard-class.htm>
3. UN's GHS website: http://www.unece.org/trans/danger/publi/ghs/ghs_rev01/01files_e.html

New Mark for Limited Quantity Packages and the Elimination of ORM-D

By Muhammad Hanif, Chemist, HTIS

In a January 2011 rulemaking, the Department of Transportation’s (DoT’s), Pipeline and Hazardous Materials Administration (PHMSA) finalized significant changes to the Hazardous Materials Regulations (HMRs) that will lead to greater harmonization with those utilized by the international transport community. One of the more significant changes is the elimination of the Other Regulated Materials-Domestic (ORM-D) exception for consumer commodity shipments of hazardous material (HM). The ORM-D exception impacts how companies including retailers, distributors, Department of Defense (DoD), and DoD contractors, transport subject materials through the supply chain.

The transportation community continues to review final rule HM-215K, the International Harmonization Rule, issued on January 19, 2011, to familiarize itself with the changes regarding limited quantities (LTD QTY), and consumer commodities. Under this rule, the PHMSA incorporated changes to the HMRs based on the 16th Revised Edition to the UN Model Regulations, Amendment 35-10 to the International Maritime Dangerous Goods (IMDG) Code, and the 2011-2012 edition of the International Civil Aviation Organization (ICAO) Technical Instructions (TI) for the Safe Transport of Dangerous Goods by Air.

The changes adopted in the HM-215K are very similar to the

changes for limited quantities in the 2011-2012 ICAO TI, and the 35th Amendment of the IMDG code. Some of the similarities and differences are summarized below:

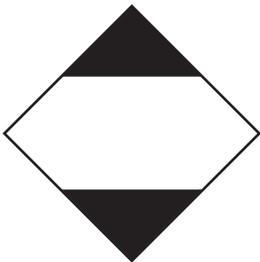
- On January 1, 2011, ICAO established and mandated a new identification protocol for identifying limited quantities, shipped via air. The new limited quantity mark with a "Y", illustrated in figure 1, replaced the UN ID number that was previously inside the diamond. ICAO now requires that this new limited quantity mark, as well as the proper shipping name (PSN), and UN ID number be displayed on the limited quantity packages.

Figure 1



- Both DoT and IMDG permitted voluntary use of the new mark beginning January 1, 2011, but mandated compliance by January 1, 2012. However, limited quantity packages prepared for ground and maritime modes of transportation must display the new limited quantity mark without "Y" as illustrated in figure 2.

Figure 2



- Limited quantity package prepared for any mode of transportation must also be marked with the appropriate hazard class label.
- Shipping papers are still required for aircraft and vessel shipments of limited quantities. However, DoT no longer requires shipping papers for shipments of limited quantities, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel.
- When a shipping paper is required, DoT requires the inclusion of the words "limited quantity" or "LTD QTY" following the basic description on the shipping paper. This

requirement is removed from the ICAO TI. However, note that carrier variations may require that "limited quantity" or "LTD QTY" be included, depending on their internal systems and acceptance policies (for example, if a carrier accepts only under 49 CFR, they may not accept an ICAO-compliant shipment).

- For air carriers, ICAO also does not require the words "limited quantity" or "LTD QTY" on the notice to pilot-in-command (NOPIC). But DoT regulation 49CFR175.33(a) (1) provides two options with respect to the NOPIC, depending on how the shipment is prepared. Paragraph (i) addresses shipments prepared in accordance with 49 CFR, and therefore would require the limited quantity designation on the NOPIC. Paragraph (ii) addresses shipments prepared in accordance with the ICAO TI and would not require the designation.

- In HM-215K, DoT explains the reasons for the elimination of ORM-D, and ORM-D-Air materials designation by January 1, 2014. Shipments prepared in accordance with the ORM-D / ORM-D-Air requirements are acceptable until that date. However, voluntary compliance with this final rule can occur immediately. DoT has extended the documentation exception for ORM-D materials being offered by surface (road or rail), provided the material is not a hazardous substance, hazardous waste, or marine pollutant.

Traditionally, the domestic provisions for limited quantities and consumer commodities have been very different from those of the international standards. Since DoT is doing away with the ORM-D classification, materials that were previously transported as ORM-D or ORM-D-Air will instead be transported as limited quantities, and receive nearly as much relief from regulation as they did under the old system. The DoT is also recognizing the PSN "ID8000, Consumer commodity" from the ICAO regulations for transporting consumer commodities by aircraft.

Since these changes are very significant, and affect a large segment of the regulated community, PHMSA has enacted an extended phase-in period for these new regulations. Additionally, by adopting this rule, the PHMSA continues its efforts to increase the uniformity of domestic regulations with international standards in order to significantly promote efficiency and harmony for the international business community.

For additional information and to discuss specifics related to the HM-215K rule, please contact:

- **Mr. Michael Stevens**
PH: 202.366.8553, or
- **Mr. Shane Kelley**
PH: 202.366.0656
- **Address:**
Standards and Rulemaking Division,
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation

Reference: Federal Register Volume 76, Number 12, Wednesday, January 19, 2011, pages 3308-3389 (76 FR 3308).

Personal Protective Equipment (PPE) Compliance

By Muhammad Hanif, Chemist, HTIS

Under the Occupational Safety and Health (OSH) Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. The Act is the primary federal law governing occupational health and safety in both the public and private sectors. The Act's General Duty Clause, Section 5(a)(1), requires every employer to protect his or her employees from all recognized workplace hazards. The Act also created the Occupational Safety and Health Administration (OSHA) at the Federal level, and provided that states can administer their own safety and health programs, as long as those programs are, at least, as effective as the Federal program. OSHA's mission is to assure safe and healthy workplaces by setting and enforcing standards and by providing training, outreach, education and assistance.

Periodically, OSHA promulgates standards for employers and employees to assist them in complying with occupational health and safety practices. These standards are provided in terms of final rules, preambles to the final rules, and interpretation letters. Among the standards, there are those that address the proper use of personal protective equipment in work places. OSHA requires that PPE be used to reduce employee exposure to hazards when engineering and administrative controls are not feasible, or are not effective in reducing these exposures to acceptable levels. The employer is required to determine if PPE should be used to protect workers.

OSHA also issues general enforcement and guidance policy for its PPE standards to its enforcement/compliance personnel, and it recently issued the "Enforcement Guidance for Personal Protective Equipment in General Industry", an updated directive with instructions that assist enforcement personnel with determining whether employers have complied with OSHA's PPE standards. The directive became effective February 10, 2011.

When OSHA issued its November 2007 final rule, "Employer Payment for Personal Protective Equipment", the rule required that employers in general industry, shipyard employment, long-shoring, marine terminals, and construction provide most types of required PPE at no cost to workers. The agency also issued a September 2009 final rule updating its PPE standards so that they were more consistent with the consensus standards that were being used.

The February 10, 2011, "Enforcement Guidance for Personal Protective Equipment in General Industry" directive, replaces "Inspection Guidelines for 29 CFR 1910 Subpart I", the revised "Personal Protective Equipment Standards for General Industry" that was initially issued in June 1995. The February 2011 directive contains the following changes:

- Clarifies that employers must provide, at no cost to workers, PPE such as goggles and face shields that fit properly without restricting vision; earplugs and earmuffs that reduce noise to acceptable levels, and are also less costly than administrative and engineering controls; and respirators to protect workers from exposure to air contaminants,
- Clarifies when employers are required to pay for PPE,
- Clarifies when employers are not required to pay for PPE,
- Provides guidance allowing employers to use PPE that complies with current consensus standards, and
- Updates PPE enforcement policies based on court and review commission decisions.

Additionally, the directive lists PPE and other items exempted from the employer payment requirements, and include questions and answers useful in clarifying PPE payment concerns.

Although OSHA's directive is intended to provide instructions to its enforcement personnel with respect to whether employers comply with PPE requirements, general industry, as well as DoD and other federal activities whose employees utilize PPE would benefit from a review and understanding of this directive. The requirements of this directive may be used or referenced to empower compliance in inspecting and enforcing OSHA and local policies.

To review or download, the "Enforcement Guidance for Personal Protective Equipment in General Industry" is available at:
http://www.osha.gov/OshDoc/Directive_pdf/CPL_02-01-050.pdf.

The final rules were published on November 15, 2007, and September 9, 2009, and are available at:

<http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=FR>

Reference: Occupational Safety and Health Administration, Directive Number CPL 02-01-050, February 10, 2011.





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