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THE NEW CLEANING TECHNOLOGY FOR THE TWENTY-FIRST CENTURY

Why Safety and Sustainability Are Now the Most Critical Factors For the Future of Industrial Cleaning Solutions

ECO-SAFE

White Paper

There is no business on a dead planet.

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Prominent American Conservationist

Safety isn't expensive, it's priceless.

Anonymous

CLEAN AND DANGEROUS

Moody Insurance—a worldwide leader providing expertise on insurance products, professional liability, and risk management for 100+ years—recently stated that individuals working in the cleaning industry are subject to all types of dangers and hazards. This is why this line of work is often listed as "one of the most dangerous professions in the U.S."[1]

Some of the biggest dangers encountered come from biological and chemical hazards. Moody emphasized that many cleaning chemicals contain a variety of ingredients that may be toxic and health-threatening if inhaled or even touched. Green cleaning chemicals can also be dangerous, especially if they are not used properly or mishandled.[2]

To illustrate the potential dangers of cleaning chemicals and agents, the Centers for Disease Control and Prevention (CDC) reported that during the first quarter of 2020, poison control centers received 45,550 exposure calls related to cleaners (28,158) and disinfectants (17,392).[3] These figure were up 20.4% and 16.4% from the same quarter one year earlier—primarily as a result of increased cleaning and chemical exposures from the COVID-19 pandemic.[4]

The American Lung Association[5] warns that many cleaning supplies can cause health problems including cancer. Some products release dangerous chemicals such as volatile organic compounds (VOCs).[6] These chemicals can also contribute to chronic

[1] See "The 4 Most Common Occupation Hazards for Cleaning Services," Moody, June 14, 2019 at https://www.moodyinsurance.com/the-4-most-common-occupational-hazards-for-cleaning-services/.

[2] Ibid.

[3] See "Cleaning and Disinfectant Chemical Exposures and Temporal Associations with COVID-19 — National Poison Data System, United States, January 1, 2020 – March 31, 2020," Centers for Disease Control and Prevention (CDC), April 24, 2020 at https://www.cdc.gov/mmwr/volumes/69/wr/mm6916e1.htm.

[4] Ibid.

[5] See "Cleaning Supplies and Household Chemicals," American Lung Association at https://www.lung.org/clean-air/at-home/indoor-air-pollutants/cleaning-supplies-household-chem.

[6] Volatile organic compounds, or VOCs, are gases that are emitted into the air from products or processes. Some are harmful by themselves, including some that cause cancer. In addition, they can react with other gases and form

respiratory problems, allergic reactions, and headaches. Past studies have also linked exposure to chemicals from cleaning supplies to occupational asthma and other respiratory illnesses.

When it comes to choosing industrial cleaning solutions there is also another critical factor—along with workplace safety—that must be given high-level consideration: sustainability. In its broadest sense, sustainability means "meeting our own needs without comprising the ability of future generations to meet their own needs."[7] In other words, sustainability is a societal goal that broadly aims for humans to safely co-exist together on planet Earth over a long time.

This concept is frequently framed in terms of "environmental sustainability" or how humans can interact with the planet without depleting, polluting, or compromising natural resources. Certainly, one way that humans are guilty of degrading the environment involves the continued use of toxic cleaning chemicals and degreasers that are eventually released into the environment.

This white paper briefly details the ways that traditional industrial cleaning/degreasing products can have an adverse effect on workplace safety and the environment. It concludes with a new, eco-friendly cleaning technology that addresses both concerns for the future.

CLEANING AND WORKPLACE SAFETY

The U.S. Occupational Safety and Health Administration (OSHA) has made it clear since its inception 50 years ago that "a safe workplace is sound business."[8] As part of its mission, OSHA provides recommended practices for companies to implement a

other air pollutants after they are in the air. See "Volatile Organic Compounds," American Lung Association at https://www.lung.org/clean-air/at-home/indoor-air-pollutants/volatile-organic-compounds.

[7] See "What is Sustainability?" University of Alberta, Office of Sustainability at https://www.mcgill.ca/sustainability/files/sustainability/what-is-sustainability.pdf

[8] See generally "Recommended Practices for Safety and Health Programs," United States Department of Labor, Occupational Safety and Health Administration (OSHA) at https://www.osha.gov/safety-management.

safety and health program to protect employees from workplace injuries.[9] The ultimate goal is to:

- **Prevent** workplace injuries and illnesses
- **Improve** compliance with laws and regulations
- **Reduce** costs, including significant reductions in workers' compensation premiums
- **Engage** workers
- **Enhance** social responsibility
- **Increase** productivity and overall business operations

Chemical exposure[10]—which can occur through industrial cleaning and degreasing products—poses a serious risk that many workers face on a daily basis in the workplace. According to the U.S. Bureau of Labor Statistics (BLS), skin exposure and inhalation of chemicals in the workplace is a significant problem in the United States. For example, in 2018, there were 25,000 recordable skin diseases and 19,600 respiratory illnesses attributed to this hazard.[11]

OSHA also warned that most chemicals readily absorbed through the skin in the workplace can cause other health effects and/or contribute to the dose absorbed by inhalation of the chemical from the air. They also noted that:

> *Many studies indicate that absorption of chemicals through the skin can occur without being noticed by the worker. In many cases, skin is a more significant route of exposure than the lung. This is particularly true for non-volatile chemicals which are relatively toxic and which remain on work surfaces for long periods of time. The number of occupational illnesses caused by skin absorption of chemicals is not known.* ***However, it is argued that an estimated 60,000 deaths and 860,000 occupational illnesses per year in the U.S. attributed to occupational exposure****.*[12]

[9] Ibid.

[10] There are two primary types of chemical exposure. Exposure through the skin known as "dermal exposure" and inhalation. See generally "The Danger of Chemical Exposure in the Workplace," Petro Cohen at https://petrocohen.com/blog/the-danger-of-chemical-exposure-in-the-workplace/.

[11] See "Dermal Exposure," United States Department of Labor, Occupational Safety and Health Administration (OSHA) at https://www.osha.gov/dermal-exposure.

No doubt, exposure to dangerous industrial cleaning chemicals has contributed to this hazard and the deaths/injuries reported. In fact, according to research appearing in the *International Journal of Occupational and Environmental Health*, a growing number of studies have identified cleaners as a group at risk for adverse health effects of the skin and the respiratory tract. Chemicals and hazardous substances used in professional cleaning products are a likely culprit.[13]

This study of 105 professional cleaning products found that they were comprised of a mixture of substances—132 different chemical substances were identified in total. Of these, up to 75% contained an irritant, 64% were harmful, and 28% corrosive. The main groups of chemicals were fragrances, glycol ethers, surfactants, solvents, phosphates, salts, detergents, pH-stabilizers, acids, and bases.[14]

When it comes to cleansers and degreasers, companies in the manufacturing industries should, if they have not already done so, adopt a "zero harm" principle like the one cultivated at high-end car manufacturer Rolls-Royce which states that "[s]mart manufacturing harnesses safety to boost productivity."[15] Safe industrial cleaning and degreasing—along with eco-friendly products used specifically for that purpose—should always be included as part of any "smart manufacturing" initiative.

Just like the "zero harm" mentality at Rolls-Royce that believes a crucial part of a safety strategy is "creating an environment where everyone can be at their best,"[16] manufacturers should also take heed of another framework that emphasizes productivity and improvement of the work environment. This framework is based on a lean manufacturing philosophy from Japan—The *6S Methodology*.[17] This methodology advocates using specific steps to organize the workplace to improve

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[12] Ibid. Emphasis added.

[13] See "Hazardous Substances in Frequently Used Professional Cleaning Products," International Journal of Occupational and Environmental Health, March 2014 at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4096065/.

[14] Ibid.

[15] See generally "Health and Safety in an Era of Smart Manufacturing," Rolls-Royce at https://www.rolls-royce.com/country-sites/sea/discover/2019/smarter-safety-for-smarter-manufacturing.aspx.

[16] Ibid.

[17] The 6S Methodology is based on the original 5S methodology. See generally https://the5smethodology.com.

efficiency and eliminate waste. The steps are as follows: (S)ort, (S)traighten, (S)hine, (S)tandardize, (S)ustain, and (S)afety. Given its critical importance in the workplace, safety was recently included in this framework—a methodology widely used by practitioners of lean manufacturing and Six Sigma process improvement.

MAKING THE CASE FOR SAFER CLEANING PRODUCTS

"The T.J. Hooper" Case

"The T.J. Hooper" is an important legal case taught to every first-year law student. It involves a tugboat in the 1920s --"The T.J. Hooper" -- that got lost at sea with the barge it was towing off the coast of New Jersey during an easterly gale. In a subsequent court case, decided by the highly respected American jurist Learned Hand, the tugboat was found to be at fault because it did not have a radio that could have warned of the danger. The T.J. Hooper argued that it was not the "custom" of the tugboat industry at that time to be equipped with a radio. Nevertheless, in his decision, Judge Learned Hand set a ground-breaking legal precedent by finding that the tugboat failed to act with the proper standard of diligence by not taking the precaution of securing a radio even though many other tugboats did not have them at the time.

The same legal principle would likely apply today to manufacturers that fail to act with the proper standard of care by continuing to use harmful chemical cleaners/degreasers when a safer and eco-friendly product is readily available for a reasonable price.

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CLEANING AND SUSTAINABILITY

In 2015 the United Nations (UN) established 17 Sustainable Development Goals (SDGs) as a "blueprint to achieve a better and more sustainable future for all people and the world by 2030."[18] Among these interlinked global goals there are 7 SDGs that closely relate to the impact of using certain industrial cleaning and degreasing chemicals:

- Good health and well-being
- Clean water and sanitation
- Industry, innovation, and infrastructure
- Responsible consumption and production
- Climate action
- Life below water
- Life on land

There are many fears today about the dangerous chemicals used in many industrial cleaning and degreasing products that give rise to environmental concerns. According to the U.S. Environmental Protection Agency (EPA), cleaning products are released to the environment during normal use through evaporation of volatile components and rinsing down the drain of residual product from cleaned surfaces, sponges, etc.[19]

Accordingly, responsible and ethical manufacturers should conduct their businesses in a more sustainable manner—preferably with a vision that aligns closely with the UNs SDGs—by addressing the environmental and health concerns posed by many industrial cleansers and degreasers available on the market today. To effectively do so, the EPA, provides some important sustainability considerations when choosing an industrial cleaner/degreaser:[20]

- **Minimal presence of or exposure to potentially harmful chemicals such as—**
    - Corrosive or strongly irritating substances,

[18] See generally "Do You Know All 17 SDGs?" United Nations, Department of Economic and Social Affairs, Sustainable Development at https://sdgs.un.org/goals.

[19] See "Identifying Greener Cleaning Products," United States Environmental Protection Agency (EPA) at https://www.epa.gov/greenerproducts/identifying-greener-cleaning-products.

[20] Ibid.

  - Substances classified as known or likely human carcinogens or reproductive toxicants by authorities such as the National Toxicology Program, the U.S. EPA, the International Agency for Research on Cancer, or the State of California,
  - Ozone-depleting compounds as listed in Clean Air Act regulations,
  - Regulated hazardous materials (e.g., products classified as hazardous waste; products that trigger OSHA hazard communication requirements),
  - Chemicals designated on EPA's list of pollutants as hazardous air pollutants (HAPs).

- **Use of renewable resources, such as biobased solvents from citrus, seed, vegetable, and pine oils.**

- **Low volatile organic compounds (VOC) content.**

- **Biodegradable by standard methods and definitions—**
  - Such as "Ready biodegradability" which is a definition meant to ensure that a material degrades relatively quickly in an aquatic aerobic environment.

- **Low toxicity in aquatic species such as fish or aquatic invertebrates—**
  - e.g., LC50 or EC50 > 10 mg/L (chronic) reported on a Material Safety Data Sheet (MSDS) or other product literature.

- **Low flammability—**
  - e.g., flash point > 200 degrees Fahrenheit.

- **pH closer to neutral—**
  - e.g., greater than or equal to 4 and less than or equal to 9.5.

- **Fragrance-free or meets EPA's *Safer Choice Criteria for Fragrances*.**

- **Designed for use in cold water in order to conserve energy.**

- Limit use of disinfectants to areas where people are likely to come into contact with contaminated surfaces.
- Conduct training on proper use of products.

In addition to the above, the EPA also makes the following sustainability and safety recommendations for the packaging and shipping of cleansers:

- Concentrated formulas with appropriate handling safeguards.
- Efficient packaging (e.g., light weight, reduced volume).
- Recyclable packaging.
- Recycled-content packaging.
- Packaging materials do not contain heavy metals, bisphenol A (BPA), or phthalates.
- Refillable bottles.
- Pump sprays rather than aerosols.
- Packaging and dilution systems designed to reduce exposure to the product.
- Packaging is sourced, manufactured, transported, and recycled using renewable energy.
- Products shipped in bulk.
- Clear labeling and information on use and disposal.
- Labeling provides information on environmental, consumer, and worker safety matters.

THE NEW CLEANING AND DEGREASING TECHNOLOGY

To address the growing concerns of manufacturers that would like to increase workplace safety, create a more sustainable planet, and decrease the overall risk associated with using toxic cleaners and degreasers—a new industrial cleaning technology has recently emerged for the twenty-first century.

EcoChemPro provides an economical and cost-effective way to achieve a superior clean without all the harmful additives. There are no acids, no solvents, no VOCs, no butyl, no fragrances or dyes, and no "forever" chemicals. This eco-friendly, all-purpose cleaning solution is 100% biodegradable and pH-balanced. Basically, it is a hazard-free industrial strength cleaner/degreaser that provides a powerful clean without harming workers or the environment. It is also USDA and FDA compliant.

This safe, proprietary formula can be used for many deep-cleaning applications including concrete, aluminum, magnesium, stainless, base metals, plastics, rubber, painted surfaces, vinyl, and laminates. Workers can safely use EcoChemPro without wearing a hazmat suit. It also improves friction on floor surfaces by 20-30%—reducing the risk of slips and falls.

As a direct release formula, it has been dubbed "a universal cleaner for a cleaner universe" because it can be effectively used in a range of spaces—heavy industry, commercial, and residential. It is powerful enough to clean even the toughest caked-on industrial grease without the use of acids, caustics, and solvents.

Billy Ray Taylor, former Director of Manufacturing for Goodyear and author of *The Winning Link* published by McGraw-Hill, said "EcoChemPro is truly the new cleaning tech of the twenty-first century because it treats safety and sustainability on an equal par with its absolute industrial effectiveness."

To learn more about how we can help make your facility clean, green, and safe—please contact us at (833) 427-7947 or info@ecochempro.com.

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"This GREEN cleans!"

EcoChemPro provides the most advanced green cleaning technology on the planet. We specialize in hard surface cleaners and degreasers that our exceptionally eco-friendly for the toughest industrial environments.

All our industrial grade products were developed to effectively clean and degrease any hard surface including floors, walls, painted surfaces, tile, ceramic, metals, plastics, marble, and wood—to name just a few.

Designed specifically for safety and sustainability, our non-toxic technology is 100% biodegradable and does not contain butyl compounds, alkalines, acids, or volatile organic compounds (VOCs). All formulas are neutral pH.


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