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Defining Green Screen Cleaning Chemistry

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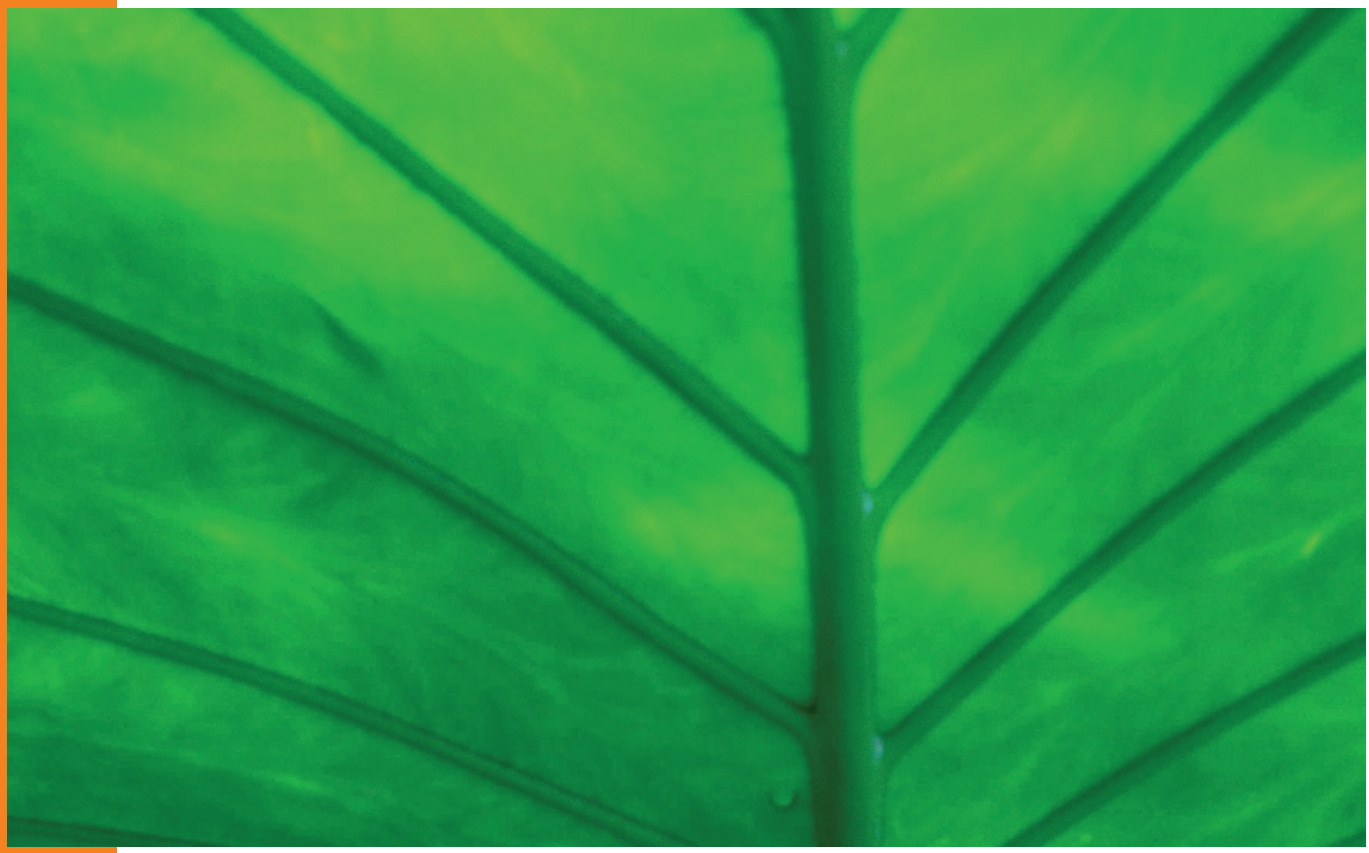

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Defining Green Screen Cleaning Chemistry

This report will explain some of the complexities of defining green chemistry and what you need to know as a consumer of screen cleaning chemicals. It discusses some of the classifications of hazardous materials and how regulations governing these materials vary from state-to-state and even from county-to-county based on your locale. The report concludes by presenting a screen reclaiming process involving fewer steps and less hazardous materials than is normally used all while lowering your carbon footprint, which will be defined too.

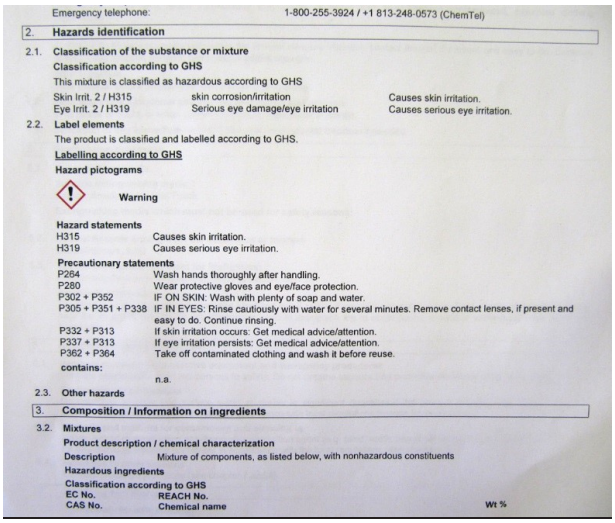
How do *you* define green? This is a question most of us don't spend much time thinking about. There are many ways to interpret or define the meaning of green. Some of us associate green with biodegradability, while others consider products green if they are considered safer to handle. Green chemistry is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green chemistry applies across the life cycle of a chemical product, including its design, manufacture, use, and ultimate disposal. [1] Generally speaking products that have minimal impact on our air, water and the land we live on can be considered green.

You can't always judge a book by its cover, or in the case of screen chemicals, by its label. This may be the case when it comes to purchasing green products for use in your screen cleaning department. Many product labels contain names, terms and/or pictures that imply the product is safe for handling or the environment, playing to our sense of responsibility to the planet we live on. Of course we all feel better when we believe we are taking care of our environment.

Caveat emptor, the Latin translation for "let the buyer beware." This is a good rule when contemplating which green products to purchase. Although some chemical manufacturers were quick to take advantage of the growing interest in environmentally friendly screen cleaning products, do not assume that if a product label says eco, green or enviro it is automatically non-hazardous or safe.

Hazardous Ingredients

Many screen cleaning chemicals, even green ones, contain hazardous ingredients. Hazardous materials have many classifications such as: flammables, combustibles, oxidizers, corrosives, toxins, and carcinogens. Of course green products should not contain any carcinogens. As for toxins, levels and duration of exposure often determine the toxicity of a particular ingredient within a product. Even green products are often classified as flammables, combustibles, oxidizers or corrosives. It is not possible to eliminate all hazardous ingredients without rendering some products ineffective.



Emergency telephone: 1-800-255-3924 / +1 813-248-0573 (ChemTel)

2. Hazards identification

2.1. **Classification of the substance or mixture**

Classification according to GHS

This mixture is classified as hazardous according to GHS

Skin Irrit. 2 / H315	skin corrosion/irritation	Causes skin irritation.
Eye Irrit. 2 / H319	Serious eye damage/eye irritation	Causes serious eye irritation.

2.2. **Label elements**

The product is classified and labelled according to GHS.

Labelling according to GHS

Hazard pictograms

Warning

Hazard statements

H315	Causes skin irritation.
H319	Causes serious eye irritation.

Precautionary statements

P264	Wash hands thoroughly after handling.
P280	Wear protective gloves and eye/face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

contains:

n.a.

2.3. **Other hazards**

3. Composition / Information on ingredients

3.2. **Mixtures**

Product description / chemical characterization

Description Mixture of components, as listed below, with nonhazardous constituents

Hazardous ingredients

Classification according to GHS

EC No. **REACH No.**

CAS No. **Chemical name** **Wt %**

All hazardous ingredients must be disclosed in sections 2 (Hazards Identification) and 3 (Composition/Information on Ingredients) of the product's Safety Data Sheet (SDS). Close analysis of the SDS will reveal what you need to know about the safety of the products you use. Familiarize yourself with the precautionary measures suggested for each of the products you use within your facility and adopt best practices for handling and storage.

Rules and regulations differ depending on where you live. Municipalities, counties and states each have separate laws regulating use of certain chemicals to protect what is considered most important in that specific region.

For example, air quality is of high concern in the state of California so their Air Quality Management District passed laws regulating levels of volatile organic compounds (VOC) permitted for use.

VOCs

VOCs are organic chemicals that have a high vapor pressure at ordinary room temperature conditions. Their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air. [2]

While there are many definitions of VOC, for use in the screen printing industry they are usually defined by The Environmental Protection Agency (EPA) or Occupational Safety & Health Administration (OSHA) for the purpose of controlling the precursors of smog. Virtually all solvents used to clean screens contain VOC. The EPA has designated some solvents exempt from classification as a VOC. This can be misleading, as some of these solvents are hazardous.

Other areas of the United States place more emphasis on wastewater effluent, and therefore administer regulations on pH levels of products put into drains. Local municipalities may also have their own regulations. As you can see this issue is more complex than it appears at first blush.

Although chemical manufacturers may be aware of many of the federal and state laws, it is impossible for them to know every regulation on a local level. Therefore, it is up to the consumer to understand their local regulations and if there are any restrictions they need to be aware of in order to remain compliant.

Understanding local codes helps you make informed decisions when discussing the proper choice of screen cleaning chemicals with your supplier. Printers are often in full compliance with local regulations but still want to do more in the way of protecting their employees and the environment.

It's important to note that the scope of green chemistry goes beyond concerns over hazards from chemical toxicity and include energy conservation, waste reduction and life cycle considerations such as the use of more sustainable or renewable raw materials.

Green chemistry can also be defined through the use of metrics. While a unified set of metrics has not been established, many ways to quantify greener processes and products have been proposed. These metrics include ones for mass, energy, hazardous substance reduction or elimination and life cycle environmental impacts. This leads us to another aspect of green products, sustainability.

Sustainability

The EPA defines sustainability as the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance. Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends, either directly or indirectly, on our natural environment. To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations. [3]

Corporate Sustainability

KIWO Inc. believes in, and is committed to, corporate sustainability. All KIWO's electrical power is sourced from 100% wind energy. Polarized, tinted windows help reduce electricity demand and their warehouse is equipped with skylights. KIWO implemented a full recycling program, manufactures products using recycled materials whenever possible, and actively and continuously sources local raw materials, and when feasible green materials.

Renewable resources usually enters the conversation when discussing sustainability. If and when possible, using renewable or recycled raw materials helps prevents the depletion of our natural resources. KIWO was among the first chemical manufacturers in our industry to introduce products made with renewable raw materials but until now the market demand for such products has been minimal. Reducing ones carbon footprint helps with sustainability efforts.

Carbon Footprint

The amount of carbon dioxide or other carbon compounds emitted into the atmosphere by the activities of an individual, company, country, etc. is usually expressed in equivalent tons of carbon dioxide (CO_2). The Carbon Footprint model is used to easily measure use of carbon, as an indicator of unsustainable energy use.

The pictogram [4] illustrates several facets of carbon footprint.

The average U.S. household carbon footprint is about 50 tons CO_2e per year. The single largest source of emissions for the typical household is from driving (gasoline use). Transportation as a whole (driving, flying & small amount from public transit) is the largest overall category, followed by housing (electricity, natural gas, waste, construction). [5]

At times, however, using low carbon footprint products involves some compromise. For example, printers in southern California who are required to use solvents with no more than 100 gm./liter of VOC are often dissatisfied with the performance of the products that comply with their air quality guidelines.

When it comes to screen openers/on-press cleaners, printers desire products that are fast-acting and evaporate quickly without leaving an oily residue. Unfortunately, most ink cleaning solvents developed with a low carbon footprint (low levels of VOC's) lack the performance offered by cleaners with higher levels of VOC. This, along with the fact that many eco-friendly products cost more, is one of the reasons green products have not been embraced as quickly as one might imagine.

Green without losing the mean (performance that is)! Indugence without the guilt.

KIWO introduced their Water Reducible Reclamation (WRR) screen cleaning system which utilizes less hazardous products and reduces your carbon footprint as well as processing steps all without compromising on performance. KIWO's WRR system reduces a four step screen cleaning process to two steps:

Step 1 – Use DUAL STRIP to remove ink (Plastisol, Water-base & UV) and stencil simultaneously.

Step 2 – Use KIWOCLEAN CONCENTRATED INK WASH to de-haze and degrease simultaneously.

These two 1-gallon containers make up to 9 galllons of reclaiming, de-hazing and degreasing solution

DUAL STRIP is a concentrated solvent/VOC-free ink and emulsion remover.

KIWOCLEAN CONCENTRATED INK WASH is a caustic-free haze remover and degreaser.

There are a few methods of using the WRR system:

1. Manual application with spray bottles
2. Dip tank pre-soak
3. Drum concentrates with pneumatic spray guns

Please refer to the product information sheet that explains the three methods in greater detail. After the majority of the ink is removed from the printing screen at the press, customers often use a dip tank similar to the one pictured filled with one part DUAL STRIP to five or more parts water.

Soak. Submerge screens into dip tank solution for approximately 1-3 minutes to allow Dual Strip to work on remaining ink residue and soften the stencil at the same time.

Reclaim. Remove screens from dip tank and place into reclaiming washout booth. Brush and pressure wash both sides of the screen to remove both ink and emulsion in one step.

[1] http://www2.epa.gov/greenchemistry/basics-green-chemistry
[2] http://enccyclopedia.thefreedictionary.com/Volatile+Organic+Compund
[3] http://www2.epa.gov/sustainability/learn-about-sustainability#what
[4] http://www.complydirect.com/news/carbon-footprint-the-facts-about-the-footprint/#.VgKzySsYIxU
[5] https://en.wikipedia.org/wiki/Carbon_footprint

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