DERMATITIS

OVERVIEW

Dermatitis creates an unpleasant condition often accompanied by scratching or itching which then exacerbates the situation. There are two types of dermatitis. The first is contact dermatitis, which simply means that something touching the skin creates a reaction. The second type is allergic dermatitis, which takes time to build an allergy against something you are exposed to repeatedly. Contact dermatitis is more common (~90%) than allergic.

Some people are allergic to different laundry detergents, perfumes, deodorants, shampoos or something else that touches their skin. Some people can touch poison ivy with no issue, while others have an extremely sensitive reaction. Most people are allergic to something at some time. It is reaction to and managing the situation that becomes important.

DEFINITION

According to the dictionary, dermatitis is “an inflammation of the skin.” There can be many things that can cause an inflammation, as people react differently to different materials and conditions. In metalworking manufacturing there can be exposure to oils, solvents, greases, cutting oils, coolants, cleaners, corrosion preventives and other chemicals that could impact workers’ skin.

There are also items in factories that can impact skin other than metalworking fluids. In restrooms there are hard cleaners that contain abrasives to help clean the skin.

Some of these are too abrasive and make the skin overly sensitive to other chemicals. Proper treatment with the necessary skin cream is required to help maintain healthy skin.

It has been seen in some factories that operators have used dish washing liquid as a hand cleaner in place of the abrasive hand cleaner. While this is a step in the correct direction in getting away from the abrasive, many dish washing liquids do not help the skin as they carry away the natural emollients that protect the skin – causing “dish pan hand” syndrome. Proper washing of skin, after exposure to most chemicals, is important to remove the contaminant. This must be followed by application of an appropriate moisturizer to replenish the skin’s natural protection.

PERSONAL PROTECTION EQUIPMENT (PPE)

Any proper Safety Data Sheet (SDS) should have a listing for PPE. This section is titled “Exposure Controls/Personal Protection.” The recommendations provide adequate protection when followed, and can include impervious aprons, different types of gloves, face masks and other implements designed to protect workers from exposure.

Many times workers are told to wear latex gloves. However, some people are allergic to latex and have to wear a different elastomer.
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Some gloves cover the skin all the way up to the elbow, for employees that are more exposed to fluids. Other types of PPE can be face-shields, goggles, cover-alls and other impervious clothing.

PPE also protects the skin from contaminants in the metalworking fluids. Many contaminants come from the tramp oil. These lubricants typically are used inside of machine tools with very little skin contact. However, when they become tramp oil they can float on the surface of the fluids and coat the skin of workers when working with and handling manufactured parts. Another type of problem is that of the metallic fines themselves. Chromium, cobalt and nickel are known to create allergic-dermatitis. Chips and debris can create tiny lacerations on the skin as workers hands are in and out of the fluid all day, or if they rub them into the skin with a wet rag.

Another aspect of dealing with dermatitis has to do with the change of seasons. Depending upon where a person lives, winter means cold weather, dry conditions and reduced moisture. These conditions can lead to dermatitis as the skin becomes more susceptible to dryness. Many people use moisturizing lotions to keep their skin smooth, soft and supple. It is possible to have chapped skin during these times. Dry skin generally leads to scratching and scratching makes the skin more open for cuts and dermatitis.

FLUID PRODUCT TYPES

There are different product types within the category of cleaners, corrosion preventives, coolants, cutting oils and drawing & stamping fluids. Many of these fluids are water soluble products, so concentration control becomes the first priority. If the product is designed to be used at 5.0% but the concentration is 20%, the higher concentration will potentially create more problems than the lower recommended concentration.

Cleaners can contain some solvents that can be a little more aggressive with regard to skin contact. Sometimes cleaners can contain higher levels of alkalinity. Alkaline materials may be more irritating to some people’s skin. The final pH value is tied to the alkalinity, so noting the pH is important.

Many corrosion preventives can contain oil and/or solvent depending upon the viscosity requirements and the level of corrosion protection needed. Some solvents may be more irritating relative to the evaporation of the fluid. Recognize, too, that the corrosion preventive protects by leaving a thin film as the preventive layer. Leaving that layer on the skin, whether it is oil-based or solvent-based, could create problems.

Many drawing & stamping fluids, along with coolants, are water soluble. Just like the cleaners, products that contain higher levels of alkalinity could be more detersive versus fluids with lower alkalinities. Synthetic fluids, as a general category, tend to be more detersive and tend to wash away some of the skin’s
natural emollients. Replenishing this natural barrier is important by using the proper lotions, creams or whatever works best.

PERSONAL HYGIENE
People are all different when it comes to their skin. Washing routinely with traditional non-abrasive soap to remove different debris from our skin during the day is important. However, different skin creams will help restore the skin to the proper level of protection. Quaker recommends Stoko products for cleansing, moisturizing and protecting the skin. Examples are as follows:

Durapro – Barrier cream to help keep skin healthy when working with water-based fluids.

Solopol – Skin cleanser designed to remove heavy-duty soils (oil, grease, metal dust, soot, graphite, etc.).

Stokolan – Conditioner that moisturizes and helps replace oil in the skin. Good for chapping, chafing and eczema.

These products from Stoko work very well. However, ensure that you are selecting the correct products for the application. Quaker’s Safety, Health & Environmental (SHE) Group can assist with any questions. Additionally, some people use over-the-counter creams, and these items seem to work just fine for them. Finally, if inflammation does occur, you can use over-the-counter cortisone creams as a first step.

The other thing to consider is the possibility of exposure to certain environmental contaminants or chemical materials that may be used or present outside of the work place. For example, someone might be working on a farm with exposure to pesticides or other chemicals used in that environment. Another possibility is exposure to gasoline, diesel or grease while working at a gas station. There are other environments that might arise where other chemicals may be involved.

Another area that many people overlook is that of clothing. Clothing that becomes soaked with splashed fluid will hold that fluid close to the skin. The longer the clothing is worn, the longer the exposure exists. In such a situation the clothing should be removed, the area washed to remove the residual, and then replaced with clean clothing. The soiled clothing should not be worn until it is cleaned properly to remove the contaminant. This same issue also goes for shop rags that are often used to wipe a part and later used to wipe the skin. If there are chemicals or fines on the part, they can become transferred to the skin. Minor abrasions can occur when fines and grinding swarf are captured in a rag. Chemicals left on the skin, or allowed to dry on clothes without washing or changing, can become more concentrated from evaporative losses of water. This higher concentration can also contribute to dermatitis.
Finally, the work environment needs to be considered for contributory effects. For instance, if associates eat in the work area or at the machines, mists, dusts, fines and other contaminants can be ingested. The body’s reaction to these contaminants can cause future allergic reactions to these same chemical exposures.

Preparation and consumption of food should be done away from the work area, and it is recommended that break areas be isolated from the machines as well.

MICRO-ORGANISMS

There are many people who believe that micro-organisms create hazardous conditions for humans. At this time, it is generally safe to state that human pathenogenic organisms do not thrive in metalworking fluids. The vast majority of bacteria in metalworking fluids are gram negative bacteria. There is a strong case that some gram positive bacteria are associated with HP (hypersensitivity pneumonitis). HP creates asthma-like conditions for workers exposed to these bacteria. It is a reaction, not a disease, because removing the worker from the contaminated fluid eliminates the HP.

More often it is the approved metalworking biocide being used on a post additive basis that can create dermatitis if it is handled and/or used incorrectly. Biocides are federally regulated chemicals that can only be used at certain dosage levels in order to remain safe. Misusing biocides by adding too much too often can create chemical sensitization. Biocides are used at ppm (parts per million) levels, and a “little too much” could create problems. Direct skin contact with biocides must also be avoided. If exposure occurs, it is critical that the biocides are removed from the skin quickly to prevent any reactions or corrosive effects.

SIGNS OF DERMATITIS

Most people can tell when something is wrong or different about their skin. The usual signs of contact dermatitis are acne-like bumps, cracked skin, crusting, itching, redness, small blisters, swelling and thickening of the skin. Steps to take are:

» Wash the skin thoroughly to remove any contaminants
» Apply an appropriate moisturizing lotion to protect the skin. Make sure skin is clean and dry before application
» Make sure that the condition that created the dermatitis has been removed (fines in the fluid, concentration running too high, pH running too high from contamination, etc.)
» If dermatitis returns, clean the skin and moisturize again. Report this to the necessary doctor, nurse or manager
» Keep soiled clothing away from the skin where the dermatitis is occurring
» Make sure that the necessary splash guards and other devices are in place to protect you from being splashed by fluids
» Use the proper PPE to protect yourself
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PREVENTION

There are things that can be done to prevent dermatitis from occurring. They are:

» Control the concentration and pH of the metalworking fluid and make sure it is in the correct range

» Minimize contamination (chips, fines, tramp oils, carry in from another process, etc.)

» As much as possible, minimize your exposure to fluids using proper PPE and equipment guards. Other appropriate engineering controls are splash guards on the machine tools, proper filtration to remove contaminants, and robotics to keep workers out of the fluid

» Insure that the correct pressures and flow rates are being used for the machine tools you are engaged with

» Make sure the machine tools are washed off at the end of the shift so that residues do not build up

» Use barrier creams and moisturizing cream when necessary. However, never use barrier creams over existing cases of dermatitis as this can worsen the condition or lead to other complications

» Wash your skin throughout the day during breaks to minimize your exposure

» Maintain good general hygiene practices. Administer the necessary care to broken or abraded skin

CONCLUSION

Dermatological issues can be managed properly if the conditions are understood, controlled and administered in a proper fashion. Work with the appropriate management and fluid providers to understand the fluids to make sure they are being used correctly. When handled properly, these conditions can be avoided.