

## Dermal Exposure Testing & Onsite Screening Summary

1. In 2011, there were 24,300 reported cases of occupationally induced skin disease in the USA.
2. Dermal exposure incidence rates are higher than respiratory exposure rates.
3. Toxic chemicals and hazardous substances can harm the skin on contact or enter the bloodstream through skin absorption.
4. The two main layers of the skin are the protective epidermis and the underlying dermis.
5. Dermal exposure to chemicals can cause irritation, burns and allergic contact dermatitis.
6. Absorption occurs when chemicals penetrate the stratum corneum layer of the epidermis
7. Employers should be aware of OSHA standards that relate to different industries and discuss exposure to hazardous chemicals. Relevant resources include 29 CFR 1910 (general industry).

### Related Examinetics Services

- Hazardous Material (HAZMAT) exam

### Overview of Skin Disease

The Bureau of Labor Statistics (BLS) provides annual data on occupational diseases and illnesses. Recent statistics show that there were 24,300 cases of reported skin disease in 2011. The incidence of occupational skin diseases caused by dermal exposure is much higher than that of respiratory illness.

### The skin

Without adequate dermal exposure prevention, workers can be exposed to hazardous substances that harm the skin on contact. Some are readily absorbed through the skin where they enter the bloodstream, causing harmful effects in other parts of the body. Non-volatile hazardous chemicals are slow to evaporate. They can remain on work surfaces for long periods of time and increase the dermal exposure potential for workers and visitors.

The skin is composed of distinct layers. The outermost layer, known as the epidermis, contains a protective covering of dead cells known as the *stratum corneum* that overlies the living cells of the epidermis. Underneath this layer, the dermis contains elastic and collagen tissues, hair follicles, sweat glands and blood vessels. When dermal exposure occurs, a chemical may cause irritation or burns. Allergic contact dermatitis can arise when the skin is sensitized over time by low concentrations of a chemical – often resulting in irritation after repeated exposure. When chemicals penetrate the *stratum corneum*, they are absorbed by the skin. This process can be accelerated by dry or broken skin.

### What regulations do you need to be aware of?

Skin diseases cause significant health problems for workers and lost productivity for employers. Direct assessments for dermal exposure include dosimeter patches and surface or dermal wipes. Indirect assessments include biological marker monitoring for chemicals in bodily tissues and fluids. The OSHA website is an excellent gateway for learning more about these techniques through the page on exposure evaluation from the Dermal Exposure subject area. To learn about dermal exposure safety in your industry, read the subparts from the following main standards: 29 CFR 1910 (general industry), 29 CFR 1915 (shipyard employment), 29 CFR 1917 (marine terminals) and 29 CFR 1926 (construction).