

Awareness of Cement Burns

By Joe Hutter

Most experienced concrete professionals are familiar with the hazards associated with portland cement mixtures, yet despite the precautionary steps most of those professionals follow, hospital emergency rooms, year after year, see far too many cases of cement burns.

Cement in its dry state is not particularly harmful to skin. When mixed with water, however, calcium hydroxide, formed during the cement hydration process, is extremely alkaline with a pH between 12 and 13. In comparison, human skin has a pH of only 5.5. Prolonged exposure, or in some cases even limited exposure, to the corrosive effect of cement paste can result in severe damage to unprotected skin (Fig. 1).

Determining the cause of those burns is relatively easy. However, because the pain that accompanies cement burns can sometimes be delayed for hours, the victim may not be aware



Fig. 1: Prolonged exposure or, in some cases, even limited exposure, to the corrosive effect of cement paste can result in severe damage to unprotected skin

of the problem and the severity can be greater than it should be. Early identification of cement burns is therefore important so steps can be taken to treat the affected area.

Cement burns can often start with minor discoloration of the skin but it is important not to assume that the severity of the burn will not get worse. Affected skin can gradually change to a deep purple-blue color, which can eventually progress to painful burns, severe blistering, and ulcerations. In some cases, cement burns can also lead to allergic dermatitis, which usually means an unexpected career change for shotcrete nozzlemen or other crew members who work with fresh concrete.

Preventing Cement Burns

The prevention of cement burns, like most workplace hazards, starts with education and training on the safe handling of wet concrete. Frontline supervisors should emphasize to shotcrete crew members the cause of cement burns and ensure that all crew members take the proper safety precautions to avoid injury.

Employers should always do their part to provide shotcrete crew members with a safe working environment, including access to the supplies necessary to treat skin that has been exposed to wet concrete. These supplies include sufficient clean, running water; a pH-neutral soap to help neutralize the effect of caustic cement (workplace cleaners that are caustic and abrasive or contain sensitizers such as lanolin, limonene, or perfume and irritants such as alcohol should be prohibited); and clean towels.

Protective clothing and personal protective equipment (PPE) will also play a critical role in the prevention of cement burns. Clothing should be the type that minimizes contact of the cement with the skin. Care should be taken to ensure that shotcrete rebound and fresh concrete cannot enter areas of friction such as sleeve cuffs and neck collars (Fig. 2). The initial layer of clothing should be kept clean and dry. If clothing does get saturated with cement paste, it should be removed and changed. A checklist of recommended clothing and PPE should include:

Safety Shooter



Fig. 2: A protective hood that prevents exposure of the neck area to wet concrete, rebound, or both will help prevent cement burns

- Full-cover goggles or safety glasses with side shields;
 - Snug-fitting alkali-resistant gloves;
 - Long-sleeved buttoned shirts with the sleeves taped to the gloves to prevent wet concrete, rebound, or both from entering;
 - A protective hood that prevents exposure of the neck area;
 - Sturdy, waterproof safety boots;
 - Coveralls or long pants tucked into boots and taped to prevent concrete, rebound, or both from entering (disposable, water-repellent coveralls are effective); and
 - Jewelry such as watches and rings should be removed to prevent wet concrete from being trapped against the skin.
4. Pat the skin dry with a clean towel, being careful not to rub the affected area; and
 5. Seek immediate medical attention (bring an MSDS to ensure the medical professional is aware of the type of exposure).

After the affected area has sufficiently healed, the shotcrete crew member should monitor the affected skin to ensure a repeat of the injury does not occur. In the event of a reoccurrence, the shotcrete crew member should investigate the possibility that skin sensitivity or allergic contact dermatitis has developed. In the event that it has, a doctor can help to determine if the individual should continue to work in a position where exposure to wet cement paste is likely.

Treatment of Cement Burns

If a shotcrete crew member begins to feel a burning sensation on the skin, the process of treating the area should begin immediately:

1. Remove any contaminated clothing and avoid rubbing the affected areas during the removal process;
2. Gently remove any material from the skin using a pH-neutral soap and water;
3. Continue rinsing the area with clean water for a minimum of 20 minutes;



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