

## A 15-MINUTE TOOL BOX SESSION

### OBJECTIVE

This tool box session focuses on causes and prevention of skin problems from Portland cement products. At the end of the session, participants should be able to explain how to test the pH of skin and surfaces like glove insides, car seats, and clothing. Participants also should be able to explain that the alkaline pH of wet cement residue can be neutralized with an acidic rinse or a buffering spray.

### SUPPLIES

To present this session, you need a box of full range pH test strips, distilled water, 2 plastic or paper cups, and a small amount of dry Portland cement. To get pH test strips, call your local safety store or Markson LabSales at 1-800-528-5114) or Lab Safety at 1-800-356-0783. For Neutralite, call 1-800-850-3908. For Mason's Hand Rinse, call 510-527-5400.



To learn more about glove wear and other protections, see **Save Your Skin: Wearing Gloves for Wet Cement Work and An Employer's Guide to Skin Protection for Work with Wet Cement in Construction**

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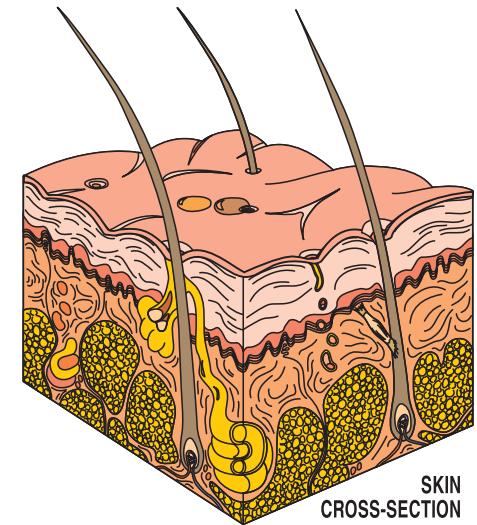
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# Save Your Skin:

## A 15-Minute Tool Box Session

### 1 What is the condition of YOUR skin?

- Have you had at least one skin problem in the last 12 months?
- Do you have the problem now?
- Do you have:
  - redness?
  - burning?
  - blisters?
  - fissures?
  - oozing?
  - bumps?
  - scaling?
  - stinging?
  - pain?
  - itching?
  - bleeding?
  - rash?



If you have any of these symptoms, you could develop a disabling, work-related skin problem.

To monitor skin problems, photocopy this page. Regularly collect completed checklists to look for improvement.

## 2 What are work-related skin problems?

Among Portland cement products workers, the most common skin disorders are dry skin, irritant contact dermatitis, allergic contact dermatitis, and cement burns.



**Dry skin** may include irritation, scaling, itchiness, burning, and redness.

**Irritant contact dermatitis (ICD)** can be acute or chronic.

Symptoms include stinging, pain, itching, blisters, dead skin, scabs, scaling, fissures, redness, swelling, lumps, and watery discharge.

**Allergic contact dermatitis (ACD)** is an immune response involving the skin. Hexavalent chromium in cement is a primary cause. ACD includes many of the same symptoms as ICD. ACD is difficult to cure and may persist for years.

**Cement burns** produce blisters, dead or hardened skin, or black or green skin. If you get a cement burn, go straight to a burn specialist or the emergency room for treatment. By the time you are aware of a cement burn, much damage has already been done. A cement burn can continue to get worse even after you have rinsed off the cement.



## 10 How do we keep skin healthy?

Wear **gloves** and practice good **hygiene**. Keep your skin pH moderately acidic.

**Wash** hands 2 to 4 times a day — before eating, taking a break, when you stop work for the day, and whenever you remove your gloves.



Use **pH-neutral or slightly acidic soaps**: pH 7 or lower. The best soaps for cement products workers may be acidic, pH 5 or 6. That's close to the pH of normal skin (4.5). These soaps tend to neutralize the alkalinity of cement. Use pH neutral soaps at home too.

For washing, use **clean running water**. If that is not available, use multiple rinse buckets. Or carry a vinegar-soaked washcloth in a plastic baggie to wipe your hands or use a **buffering spray**.



Avoid barrier creams. The abrasiveness of cement can break the cream's seal. Applying barrier creams in the work area can trap contaminants against your skin.

## 8 What is an alkali?

An alkali is a **caustic** material. Alkalies have a corrosive or irritating effect on living tissue.

Like acids, alkalies burn skin. But alkalies are sneakier than acids. Alkalies damage skin slowly. An alkali such as **wet Portland cement** can stay on your skin for several hours before you feel the chemical burn.

Acidity and alkalinity are measured on a pH scale.

## 9 How can we control alkalinity?

Adding an acid to an alkali tends to neutralize its pH. Adding vinegar to cement water can drop the pH from 12 to 8. But it also generates heat.

Buffers may be a better choice than vinegar. Buffers neutralize both acids and alkalies and generate less heat. Commercial products are marketed for neutralizing the pH of Portland cement products on the skin. **Neutralite** is a buffering solution.

**Mason's Hand Rinse** is an acidic rinse. In theory, either product or another similar product could be helpful if it neutralizes cement residue on the skin surface.



## 3 How common are skin problems?

U.S. masonry trades lose work days from skin problems at 2.5 times the national average. Concrete workers lose time at 7 times the average. A statistically reliable survey of apprentice cement masons found 71% had one or more skin problems.



## 4 What causes skin problems?

Skin disorders can have one or many causes, among them:

- **environmental conditions:** cold, heat, sun, and humidity can damage skin or increase the harm of other factors
- **worksite materials:** Portland cement, admixtures
- **conditions of use:** How long the product is on your skin and how often you use it can help determine whether it will cause a skin problem.

## 5 What is the nature of cement?

- it's **abrasive**
- it's highly **alkaline** (caustic) when wet
- it **absorbs moisture** from your skin
- it usually contains **sensitizing chemicals** and metals, like hexavalent chromium



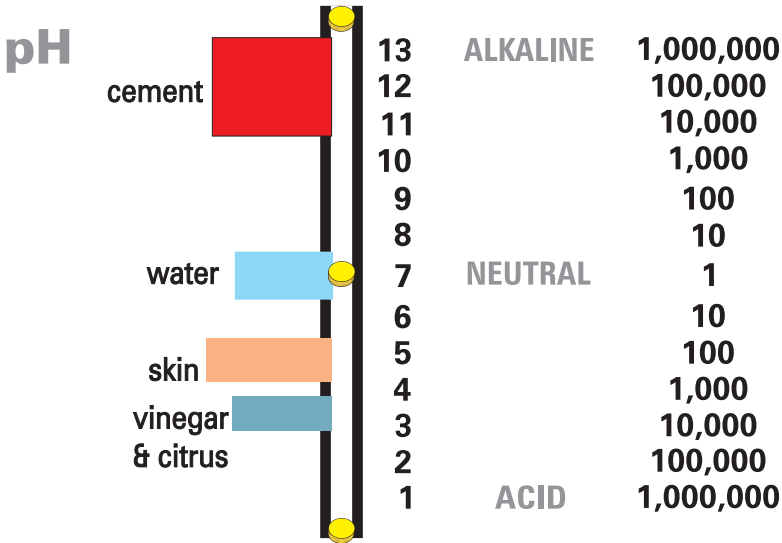
# 6 What is pH?

pH is a measure of the **alkalinity** or acidity of a material. Pure water is pH 7. pH 7 is considered pH-neutral.

The pH scale runs from 1 to 14. Strong acids are less than pH 1 to 3. Vinegar is a weak acid (3.5 pH). Skin is 4.5 pH.

Strong alkalis are 12 to 14 pH. Wet cement — and lye — are 12 to 13 pH.

Like the Richter scale for earthquakes, the pH scale is logarithmic. For every whole number increase or decrease, the pH changes 10-fold! The pH of wet cement is **one billion times higher** than the pH of skin.

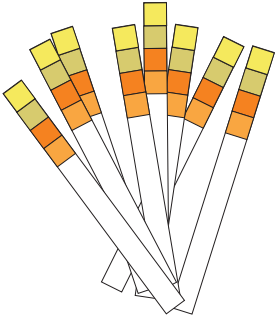


Skin exposed to wet cement becomes more alkaline. At higher pH, skin is more permeable and absorbs more chemicals. Higher alkalinity also may encourage bacterial growth, causing infections that worsen skin problems.

# 7 How do we know what the pH is?

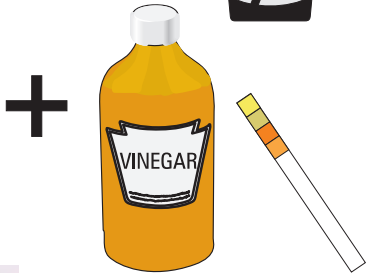
The MSDS may list pH. Or you can use pH test strips.

To test dry surfaces, moisten a pH strip in distilled water and lay it on the test surface. For liquids, dip a pH strip in the liquid.



## Let's try these pH tests:

- Dip a pH strip in distilled water. Compare the strip with the color key. What does it tell you about the pH of water?
- Add a little Portland cement to the water and stir. Dip a new pH strip into the solution. Compare it to the color key. What happened to the pH?
- Add a little vinegar to the water and stir. Dip a clean pH strip in the water. What happens? What is the pH now? What does it mean?



You can also test your hands, your gloves or hard hat, a bar or liquid soap, your car or truck seats.

