

## 5

## Garment factories



Cutting and sewing clothing is hard on the body. But low wages, fast production lines, unsafe conditions, lack of unions, and harassment hurt workers even more (see Part 4: Social Dangers and Solutions).

Garment work can be designed and organized to protect workers' health by ensuring high standards in all factories for:

- good ventilation (see chapter 17) and the right personal protective equipment (PPE, see chapter 18).
- fire exits, fire prevention measures that include sprinklers and fire extinguishers, and emergency evacuation plans (see chapter 11).
- freedom to organize unions and health and safety committees (see chapter 2).
- maintenance of equipment and worker and management trainings on health and safety.
- respectful treatment including a living wage and social benefits required by law (see chapter 19).

Achieving these basic human rights is still a struggle in most factories. The challenge is to connect and organize with other workers and consumers to win these changes from the factory owners, the international corporations that contract them (the “brands”), and the government.

## Treating cloth with dyes and chemicals

Before it gets to garment workers, cloth is often treated with different chemicals that give the fabric color, fire resistance, permanent press, or other qualities. Bleach makes the fabric white and easier to dye. Dyes give the fabric specific colors. Mordants improve how color sticks to the fabric. Sealers and fixers prevent dyes from washing off with water or sweat.

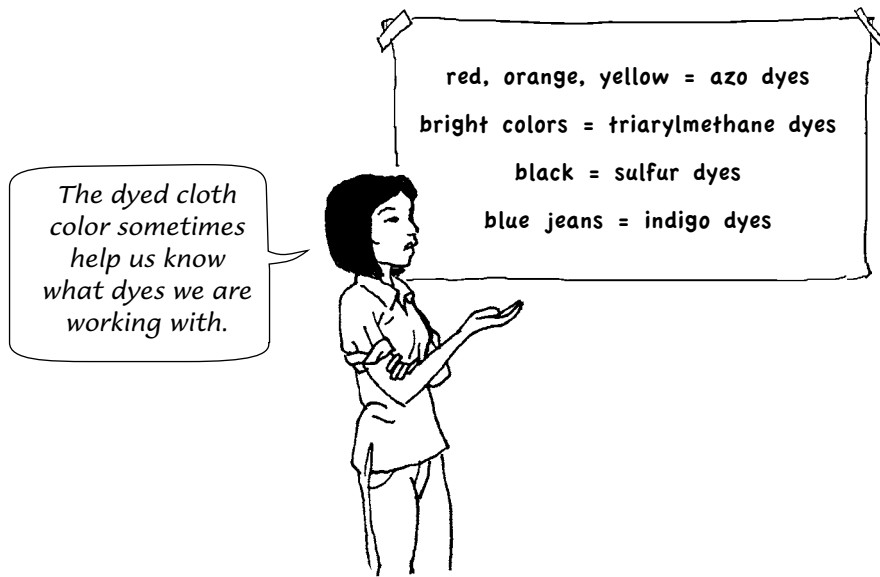
The chemicals stay on the fabric. If you get rashes when working with cloth, it might be caused by the dyes or chemicals used to make it.

### Dyes

Dyes and chemicals can irritate your skin and cause rashes, allergies, or breathing problems.

Cleaning your hands with solvents after working with dyes also can cause rashes, allergies, and breathing problems. Stay away from benzene or chemicals that smell sweet or pleasant. These chemicals, called aromatic hydrocarbons, are breathed in or absorbed through the skin. Some of them cause cancer.

Alcohols (such as isopropanol, IPA) are less dangerous but they still irritate your skin. Even though it may take longer to get the dye off, wash your hands with water and soap instead.



Some azo dyes are banned because they can cause cancer and are very harmful to your health. See Dyes on pages 485 to 487.

### **Permanent press and waterproofing**

Formaldehyde is added to fabric to make it smooth and less likely to wrinkle or crease. Workers dip the fabric in formaldehyde baths, or put fabric in large chambers filled with formaldehyde gas. Workers in this part of the process are exposed to the most formaldehyde, although without good ventilation, all workers in the shop will be exposed to an unhealthy amount.

Formaldehyde irritates the skin, making it red and itchy. Breathing the fumes harms the nose, throat, and lungs. Formaldehyde causes asthma and cancer (see pages 496 to 497).

### **Fire resistant chemicals**

Fire resistant chemicals, such as brominated flame retardants, make clothing less likely to burn. However, these chemicals can harm the reproductive system and cause cancer. (See pages 488 to 492.)

### **Antibacterial treatments**

Garments are dipped in baths containing silver, triclosan, or trichlocarban. These keep bacteria from growing in the garments and make them less likely to smell. Workers add the chemicals in liquid, powder, or pellet form into baths which are then heated. Antibacterial chemicals gradually wash out when the clothing is washed at home.

Silver is particularly dangerous because it does not break down. It accumulates in and poisons people, animals, water, and land.

### **Nanoparticles**

Some chemicals are used in a form called nanoparticles, which means they have been made to be very, very small. Nanoparticles can be spun into fibers or coated on them after the cloth is made. Cloth is treated with a variety of chemical nanoparticles to make it sturdier, to fight bacteria, to resist stains and repel water, to protect against the sun's rays and against fire, and for other uses.

Nanoparticles are so tiny that they can easily pass through skin and into our blood and internal organs. Workers should be extremely careful working with nanoparticles and demand that all safety systems – enclosures, ventilation, and others – be in good working order. If you handle nanoparticles, wearing a double set of nitrile gloves is recommended, but no one really knows if they protect enough.

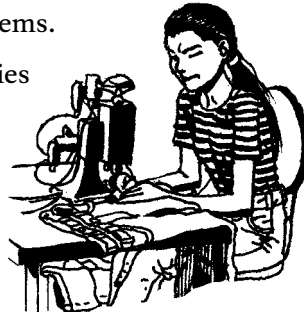
## Keep chemicals out of your body

Reduce the amount of chemicals that get on and inside your body.

- **Wash your hands often**, especially before eating, drinking, or smoking. This can stop chemicals from going into your mouth.
- **Wash your hands only with water and soap.** Avoid using solvents to clean your hands.
- **Use skin lotion or hand cream on your hands** after washing to prevent skin from drying. Healthy skin keeps out chemicals better than cracked, red skin.
- **Wear long sleeves** to protect your arms.
- **Wear the right kind of protective gloves**, especially if you add chemicals to the fabric. See Gloves on pages 262 to 265.
- **Wear a mask.** If you can see, smell, or feel the effects of a chemical, the ventilation is probably not working or not strong enough to keep these chemicals away from your nose and mouth. See Masks and respirators on pages 266 to 270, and chapter 17: Ventilation.
- **Tell your employer** which fabrics cause rashes or breathing problems. Get him to change the fabric to one that does not cause rashes or other health problems.

Materials besides cloth can also cause allergies and rashes, such as nickel in rivets.

If you get a rash, see page 158 to learn how to reduce the discomforts of a rash and watch for signs of other health problems.



### Organize to demand that your employer:

- Label chemicals in the language workers speak and share Safety Data Sheets (SDS) with workers (see pages 180 to 182 to learn how to read an SDS).
- Train all workers on safe chemical handling.
- Improve machines and ventilation before trying to solve the problem with personal protective equipment.
- Respect your country's laws on chemicals at work.

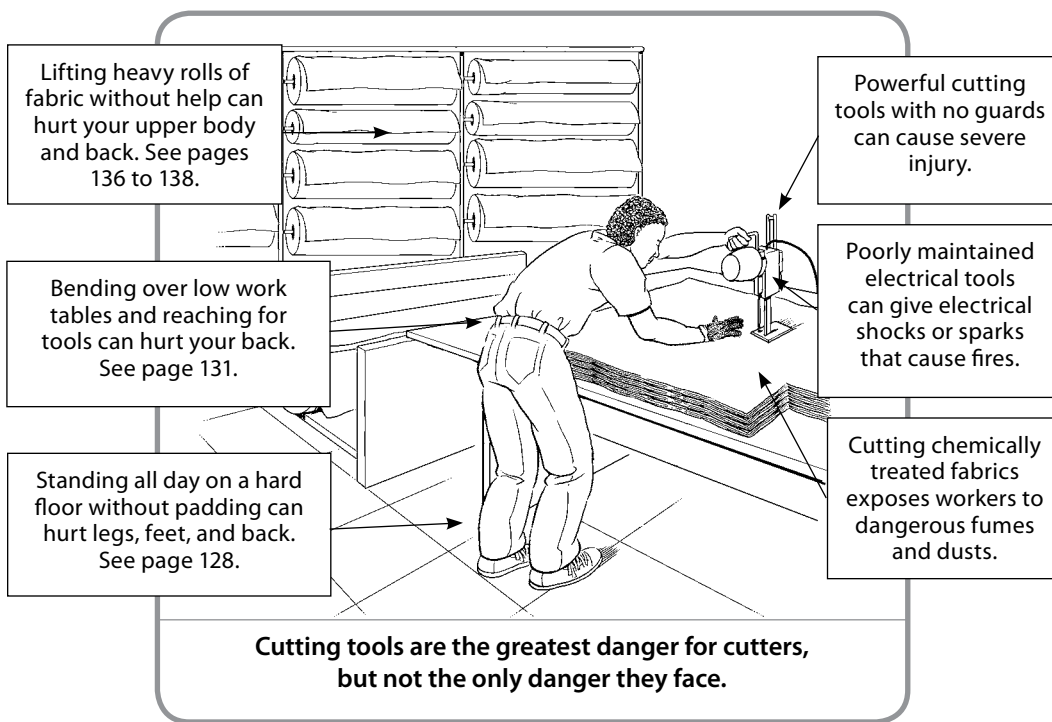


Keep information about your rashes or breathing problems in a health notebook (see page 47).



**Health  
Info**

## Cutting the fabric



Cutting tools can be very dangerous. To protect workers from being cut or injured when cutting fabric:

- Machines should have guards that surround the blade. See pages 195 to 197.
- Workers should wear metal mesh gloves so they don't cut their hands. See page 265.
- Workers should receive training on how to use the machines safely — especially how to turn them off quickly!
- Factories should have a first aid plan and supplies for treating cuts and injuries. See First aid for machine injuries on pages 203 to 204.
- Factories should also have a health plan to care for and provide rehabilitation to injured workers. It should include compensation to injured workers and their families for temporary or permanent disability that stops them from working.

## Dangers from dusty factories

Air thick with fabric dust is very common in garment factories and harmful to health. But dust is an easy problem to solve:

- Local exhaust ventilation prevents dust from getting in the air (see pages 250 to 251). Check local ventilation by doing the Following the Air activity on pages 253 to 254. For local ventilation to work it needs to be checked, maintained, and cleaned regularly.
- Enclose machines or processes that produce a lot of dust (see page 169).
- Clean your work area regularly with a vacuum, mop, or wet rag (see page 221).

### Breathing problems caused by cotton dust

Inhaling dust from cotton and other fabrics can cause breathing problems such as:

- dry, itchy nose
- cough that does not go away
- mucus (phlegm) the same color as the fabric
- trouble breathing

Breathing cotton dust day after day can also cause a more serious lung disease called brown lung or byssinosis. Signs of byssinosis are:

- chest tightness
- wheezing
- bronchitis that keeps coming back
- cold or allergy signs

If you have these signs, see a health worker who can test you for byssinosis or another lung disease.

Stop smoking and try not to be around people who are smoking.

Home remedies including physical exercise, breathing exercises, and inhaling steam can help, but will not cure it.

Asthma medications might lessen the signs of byssinosis but do not cure it. A person with advanced byssinosis might need an oxygen machine to help her.



**Health  
Info**

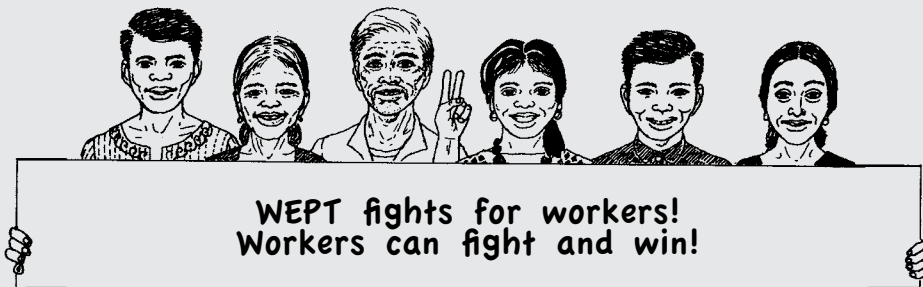
## We fought for 15 years to get compensation

We formed the Council of Work and Environment Related Patients' Network of Thailand (WEPT) because our work in a garment factory in Thailand was making us sick. We had trouble breathing from cotton dust, hearing loss from noisy machines, and damaged eyesight from poor lighting.

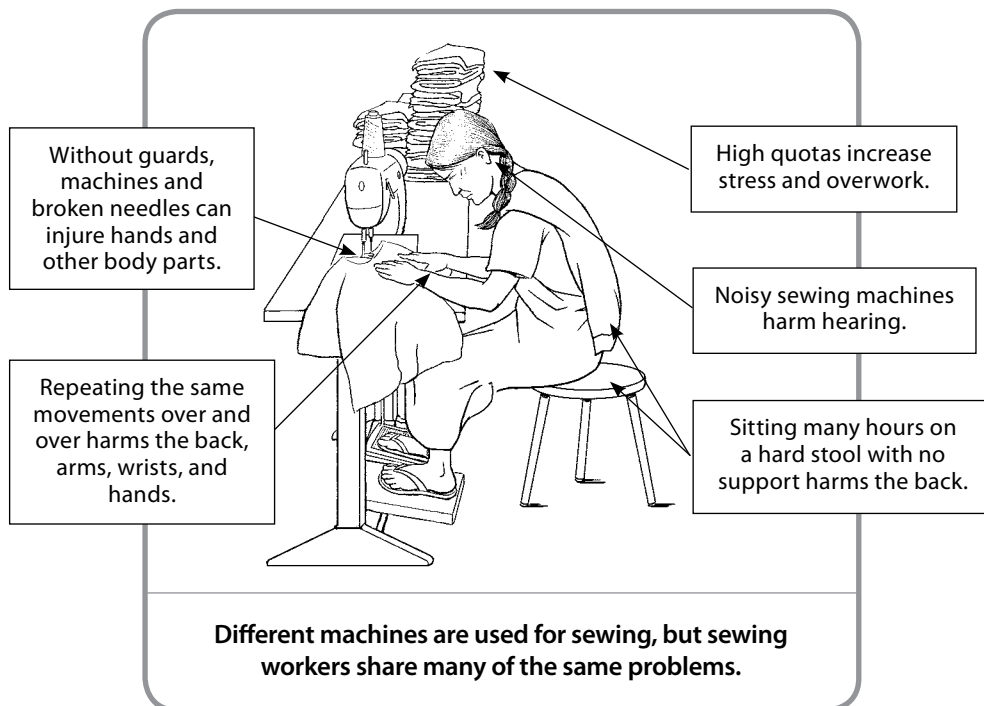
A doctor diagnosed a number of us with byssinosis, an occupational disease. This diagnosis enabled us to make a case against our employer. He knew there was a lot of dust but didn't protect us. We told him we had trouble breathing but he didn't do anything. The result was we got sicker and sicker until we got byssinosis. So 200 of us joined together to fight for our lives. The court told our employer he needed to compensate us for making us sick. But the employer did not want to pay. He made us go through more than 100 different court cases and appeals.

After more than 10 years, we got a little compensation, but only a pittance. We couldn't live on that! So 37 of us decided to continue fighting.

After 15 years, in 2010, the Supreme Court on Labor Affairs said our employer had to pay an adequate amount of compensation. This money could never give us back our health or make up for all that we suffered fighting for justice while trying to earn a living. But it was a big win for us. Many workers have byssinosis but never get it diagnosed and often their employer refuses to take responsibility. This win, our win, proves it is possible to fight for justice and be successful.

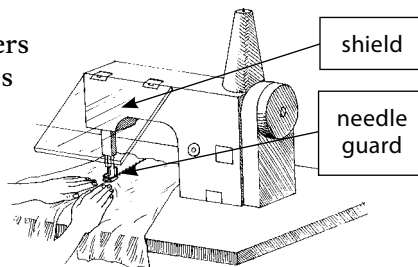


# Sewing



**Machine injury:** Needles in the machine can cut your fingers and hands and can break and fly into your eyes. Moving parts can catch hair and pull it out or pull a person into the machine.

- Machine guards and shields can protect workers from getting cut, stabbed, or injured by needles (see pages 193 to 197).
- Enclose drive shafts and moving belts (above and under the table!) to keep hair, clothing, or anything else away from moving parts (see page 193).



**Strain and injury:** Sewing machine operators do the same movements over and over. Reduce overuse injuries caused by repeating the same movements:

- Take breaks, rotate among jobs, and stretch and strengthen different muscles.
- Improve your workstation to support your body and reduce the reaching, strain, and strength needed to operate your machine. (See chapter 7: Ergonomics.)



**Noise:** Sewing machines and riveting machines are very loud. When many are running at the same time, the noise level can be very high. Too much noise can permanently damage your hearing.

- Ask an OSH professional to measure the noise level.
- If noise levels are too high, wear ear protection (see pages 271 to 272).

**Light:** Good lighting helps you see your work without straining your eyes. Not enough light makes you squint or get too close to the work, which weakens the eye muscles and can lead to blurry vision (see chapter 14: Light).

- Have the boss install better lighting.
- Do exercises to strengthen and stretch the muscles around your eyes (see page 75).

**Fires:** Many things can start a fire — bad electrical connections, chemical spills, dust, or smoking cigarettes. But fires in garment factories quickly turn deadly when factory owners do not provide fire extinguishers or sprinklers and do not maintain safe and clear exits. See chapter 11 for information about how to organize to prevent fires, to stop them if they start, and to demand policies in the factory that protect all workers from fires.

### Trapped behind locked doors and windows

The Ali Enterprises factory fire in Karachi, Pakistan in September 2012 was one of the deadliest fires in history, killing 289 people.

A boiler exploded and the chemicals stored near it caught fire. The factory owner had locked all the exit doors “to stop theft” and there were no emergency systems to stop the fire. Workers on the top floors of the 5-story building tried to jump out of windows. Others found no escape and were suffocated by smoke or burned to death.

The factory had passed a safety audit just a few weeks before the fire. Safety inspectors either missed or ignored unsafe conditions, or were misled by the owners. But even without corruption, an occasional audit cannot compare to an active, joint worker-management safety committee, present in the factory all day, every day.

In response to this tragic fire, 70 Pakistani trade unions and community groups formed the Workers’ Rights Movement. They are demanding compensation for injured workers and families, the arrest of the factory owners, and enforcement of safety laws in factories.

## Finishing the garments

After the garment is sewn, it will be processed again to add certain qualities or colors. End-of-the-line workers correct mistakes and wash and spot-clean the garment. Then it will be dried, pressed, and pleated before the final counting, sorting, and packaging.

### Dangers from acid-washing

One of the final steps of making some jeans is to put them in a large washing machine filled with pumice stones. The stones rub against the cotton of the jeans to make it softer and lighter. Some jeans are then acid-washed. Workers sponge or spray potassium permanganate bleach, chlorine bleach, or other bleaches on the garment to make it look worn. Or they soak pumice stones in the bleaches and put them in the washing machine where the jeans are washed. Sometimes jeans are tied or twisted to create different patterns. (The job of tying or twisting garments is often done by homeworkers. See chapter 20: Doing factory work at home.)

The bleaches used in acid-washing can burn your skin and irritate your eyes, nose, and throat. Potassium permanganate bleach can also cause other health problems, including decreased fertility for men and women, and liver and kidney problems (see pages 477 to 478).

If you work in an area that uses bleaches to wash jeans:

- Make sure there is good ventilation.
- Wear acid-resistant gloves, clothing, and face shields.
- See that wash stations and first aid are nearby.
- Pressure your boss to stop using acid-washing.

### Dangers from sandblasting

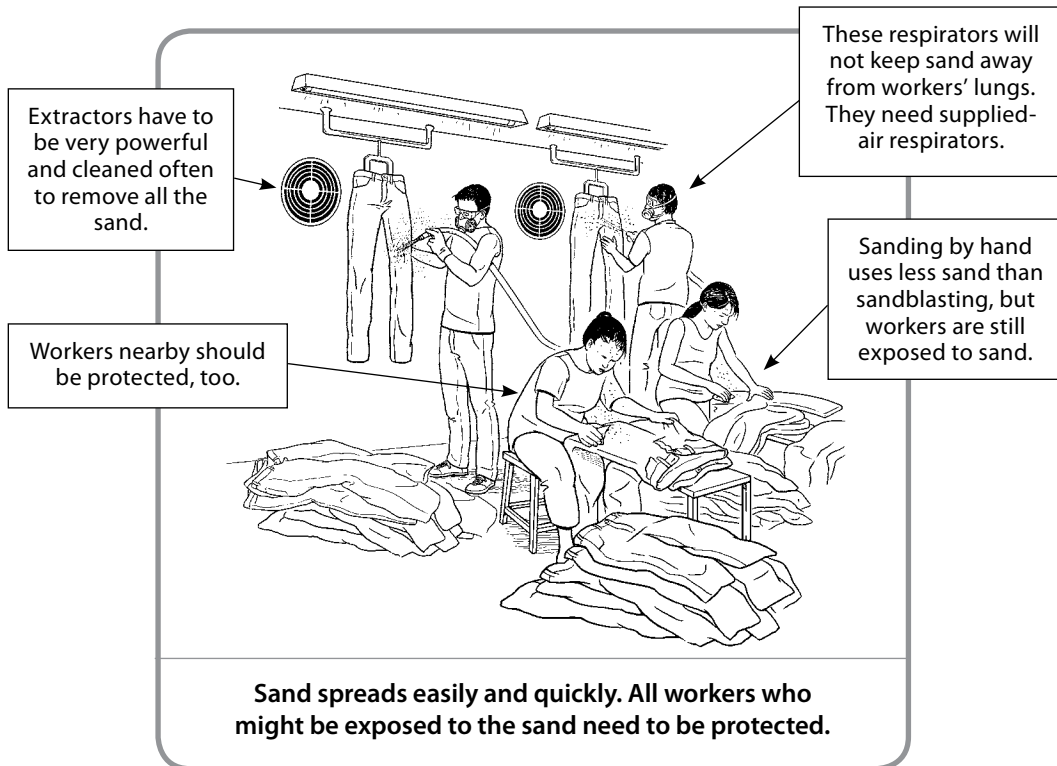
Another way to lighten and soften denim is for workers to use a high-pressure machine to spray the jeans with sand. Sandblasting is so dangerous to workers' lungs it has been banned in many countries. Sometimes brands prefer jeans sanded by hand. But sanding by hand creates many of the same health dangers and can be worse when workstations do not have strong ventilation to remove the sand.

Unsafe sanding and sandblasting expose workers to sand dust, also called silica dust. When silica dust gets in the lungs, it cannot be breathed out. Silica dust causes an illness called silicosis. Silicosis makes breathing difficult and can cause auto-immune diseases, lung cancer, and death. There is no cure for silicosis and a person who continues to be exposed to silica dust will continue to get worse. People exposed to silica or who have silicosis are also more likely to get TB (tuberculosis). Smoking tobacco makes silicosis damage worse.

For sanding and sandblasting workstations to be safer, workers need:

- enclosed workstations to keep sand from spreading.
- strong vacuum extractors to remove the sand (see pages 250 to 251).
- good ventilation to move sand away from workers (see pages 251 to 252).
- respirators with supplied air are needed for sandblasting. Dust masks or respirators will not protect enough (see pages 266 to 270).
- work areas designed to stop sand from spreading in the factory.

Safer alternatives are now used in many factories. Levi's and some other brands have stopped using sandblasting.



### **Workers should not die for fashion!**

We came from other countries and got jobs sandblasting jeans in Turkey. We worked and lived in the workshop. We used machines to blast sand on the jeans to create a special look. The sandblasting was very strong.

Our boss gave us nothing to protect ourselves. We used bandanas or whatever cloth we could find to cover our mouths and noses. But our eyes and hands were not protected. After work we would go upstairs from the workshop and that's where we would sleep.

Soon, many of us starting having breathing problems. And as time went on, we got bad coughs that did not go away. It became harder to breathe. Many of us started losing weight. Some people became so sick they went back home to their families. We never heard from them again.

A few of us went to the occupational clinic and were diagnosed with silicosis. We discovered we would never be able to work again, or walk, or run because our lungs were so damaged. But we were the lucky ones. Dozens of workers died from silicosis. And those were just the ones we knew about.

The workers disabled from silicosis were very angry. Why did the bosses do this to us? Jobs should not kill people! We began organizing with other workers in Turkey. Soon we connected with organizations around the world, such as the Clean Clothes Campaign. They helped us put pressure not only on the factory owners but on the brands whose products we made. The factory owners had to take responsibility for making workers sick. But nothing was going to change if we didn't get the brands to stop demanding that factories sandblast jeans. We also needed to make sure no more people got that horrible disease. We organized rallies, conferences, and talks and, finally, the government of Turkey agreed to outlaw sandblasting in the country.

Then we turned our attention to the brands. With pressure from the people, labor unions, organizations, and even some governments, we got several brands to ban sandblasting! Some companies began using other methods, which are just as bad as sandblasting. But we were ready for them. The campaign and strong networks we built will continue fighting against sandblasting and any other process that harms workers. Workers should not die for fashion!

## Dangers from screen printing

Sometimes workers screen print pictures or designs on garments, especially T-shirts. For many years, the inks used in printing, and the solvents used to clean up, were all petroleum-based and toxic for workers. Much of the industry now uses vegetable- or water-based inks and solvents, which are much safer for workers and the environment.

After the image is printed on the garment, it is put in an oven-type dryer. This machine gets very hot. To reduce risks:

- Vent machines out of the workplace.
- Install machine guards against burns and injuries (see pages 193 to 197).
- Train workers in the safe use of machines.
- Turn off, tag out, and lock out all machines before cleaning (see pages 201 to 202).



Fire is a danger because of the chemicals used in screen printing.

- Make fire extinguishers available and train workers to use them.
- Store chemicals in closed metal containers and label them.
- Dispose of rags used for clean-up in tightly closed metal garbage cans.

## Quality control

Workers inspect the garments and correct small mistakes by undoing and hand-sewing to fix the problem. They also cut and pull any remaining threads. They make sure the garment looks clean and neat.

If the garment is dirty, workers usually clean it with solvents. But many solvents used for cleaning are toxic (see the box on the next page).

Ask your employer to use less toxic solvents, wear gloves, and make sure you have good ventilation at your workspace.

*They don't let us sit. Only the people sewing get to sit. They say sitting slows down quality control. But we need chairs!*



**These cleaning chemicals cause serious health problems:**

- **Methylene chloride** can cause lung, liver, and pancreas cancers.
- **Tetrachloroethylene (PERC)** hurts the liver and kidney and can cause cancer.
- **Trichloroethylene (TCE)** causes liver damage and may cause cancer.
- **Toluene** can cause birth defects, kidney and liver damage, and catches fire easily.
- **Trichloroethane (TCA, or methyl chloroform)** causes nerve damage.

**These chemicals are less dangerous, but catch fire easily:**

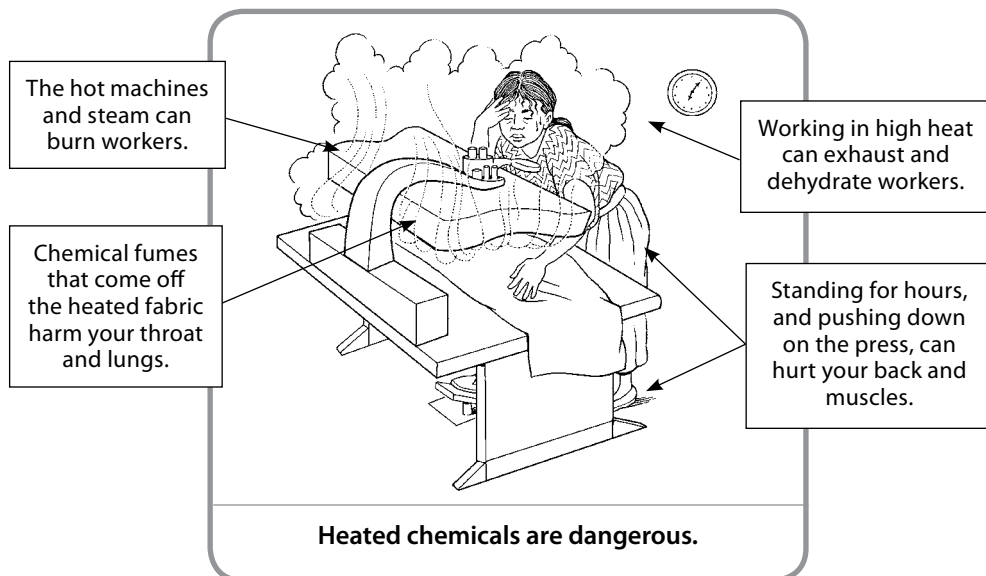
- **Acetone** irritates eyes and nose.
- **Ethanol (or ethyl alcohol)** irritates eyes and nose.
- **Isopropyl alcohol (or isopropanol)** irritates eyes and nose.

**Protect workers:**

- Use less dangerous chemicals and processes.
- Label all chemicals, give workers SDS in the language they speak, and train workers to use them safely.
- Replace toxic cleaning chemicals with water-based alternatives.

See Appendix B for more information.

## Drying and Pressing



## Pollution from garment factories

Garment factories are often built in areas where there are few industrial services available. So garbage from the factory is burned or dumped on the land, and chemicals are released into the air and water. For more information, see chapter 33: Pollution from factories.

### **Our water turned bright blue!**

Our government in Lesotho, Africa invited big brand names to set up factories here. Gap and Levi's opened factories and many people were happy to have jobs.

Making jeans produced a lot of waste. Many materials could not be recycled. Water used to treat, rinse, and wash the fabric was polluted. And there was a lot of waste from machine maintenance and all the paper and plastic from the office.

The companies said they had systems to collect and take care of the waste. But the factories in Lesotho didn't have a system. They just dumped solid waste onto the land and polluted water into our streams.

The dumps filled with fabric, needles, chemical containers, and many other things the factories threw away. People from the community went to the dump to collect what they could use or sell. Children would carry chemical containers back to their homes for storing water. They would pick up needles and tools. Some women began burning fabric scraps in their cooking fires. They didn't know the fabric was treated with chemicals and that as the scraps burned they poisoned their air and food.

The streams turned blue. Bright blue! This water irrigated our fields. All those dyes and other chemicals went straight into the food we ate.

One of our community leaders asked a photographer to take pictures of the waste. After they were put on the Internet we got more visitors. People came from newspapers and magazines to show the world what was happening here. Gap and Levi's came too. They said they didn't know this was happening and that it shouldn't have happened. They made the factories clean up. But we are still waiting to see how they will stop making so much waste and what they will do with the waste they have already thrown away.