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SAFETY CLOTHING FOR WOMEN IN INDUSTRY



WOMEN'S BUREAU
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SPECIAL BULLETIN No. 3

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, SECRETARY

WOMEN'S BUREAU
MARY ANDERSON, DIRECTOR



Safety Clothing for Women in Industry



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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,

Washington, May 23, 1941.

MADAM: I have the honor to transmit herewith a report on safety clothing for women workers, constituting the third in the series of special bulletins for the employment of women in the defense program.

The research and the writing of this report are the work of Margaret T. Mettert of the Bureau's Research Division.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,
Secretary of Labor.

III



Courtesy American Mutual Liability Insurance Co.

SAFETY CLOTHING FOR WOMEN IN INDUSTRY

The well-dressed woman in industry is a safe worker.
Clothing suitable to the job helps to avoid accidents.
Consider your feet first.
Wear your goggles; you can't replace an eye.
Wear a cap around moving machinery.
Work dress must suit the job to be safe.
Hand coverings can prevent skin infection and other injury.
Jewelry has no place in the factory.
Jobs with special dangers require special kinds of work clothing.



The Well-Dressed Woman in Industry is a Safe Worker

Safety clothing is designed for its attractiveness as well as its utility. It has become fashionable to dress and act so that accidents cannot happen. The girl who was afraid to carry a mirror lest she bring bad luck by breaking it has become the girl who knows that accidents have definite causes that can be avoided.

Clothing Suitable to the Job Helps to Avoid Accidents

Safety conventions have so far recognized the importance of safe clothing that they have included on their programs "fashion parades" (see frontispiece) of clothes designed especially for industrial women. Designers have in mind first safety, then convenience, wearability, comfort, cleanliness, and coolness. Attractiveness is given due consideration.

In selecting the material for uniforms it should be borne in mind that lightly starched fabrics are said to be more resistant to fire than are fabrics without starch, and that cellulose fabrics are more inflammable than cotton.

Safety clothing of various types has saved many thousands of workers from permanent crippling, disfigurement, or blindness, and many more from time lost from work and weeks of pain and illness.

Consider Your Feet First



Much fatigue and nervousness can be laid to badly fitting shoes. If you suffer from chronic fatigue or pain in your feet or in the muscles of your legs, ask the plant physician or nurse to advise you about the right kind of shoes to wear.

The correct shoe is long enough to place the ball of the foot in the tread of the shoe. The shoe allows for the natural spread of the toes, and fits snugly around the heel and instep. The heel is medium or low. The foot should always be measured with the standing weight placed on the measuring rule. The width should be fitted as carefully as the length. If deformities exist, exercise and mechanical devices will help.



High or run-down heels and thin or worn soles can be the direct cause of a fall. Well-fitting shoes with low heels and good soles can help to maintain footing on wet or slippery floors.

Falls are a major cause of women's injuries in industry; and they are especially serious, and result in much loss of time, among older women. Important causes of falls are wet, slippery floors and other evidences of poor factory housekeeping.

Some occupations require the wearing of safety shoes. Usually this is necessary if there is any danger of dropping heavy material. They can be as comfortable to wear and as attractive in appearance as an ordinary shoe. Such shoes with reinforced vamps have saved the loss of many toes. Several nationally known firms make them in all sizes for both men and women.

A specially designed foot protector for girls working in an optical-glass department is shown in figure 1. Made of chrome leather, it has a piece of aluminum curved to fit the top of the foot. This is protection to the instep and top of the foot against falling glass or other falling objects. Where workers handle acids, or where conditions of great heat or moisture exist, wooden-soled shoes have been designed.



Courtesy Pittsburgh Plate Glass Co.
Fig. 1.—Foot protector for girls
in glass manufacture.

Women who work where explosives are manufactured or handled must wear shoes with sewed or wooden-pegged soles and heels with copper nails.

Wear Your Goggles—You Can't Replace an Eye

Wear an approved safety goggle in all work even remotely hazardous to your eyes. Accidental eye losses cost industry about 50 million dollars a year. They cost each worker who loses an eye his most precious possession, his sight. In New York alone almost 2,000 workers a year suffer eye injuries severe enough to make them eligible for compensation benefits. The most frequent cause is flying bodies. Other causes are tools or machine parts and splashing liquids. No one can tell when or how an eye accident will happen, and precautions should be taken.



Goggles are made in lightweight comfortable frames to wear by themselves or to fit over prescription glasses. There was a time when goggles were crude because a glass had not been produced that could stand heavy blows. Now glass can be so tempered that it will not shatter from any blow.

One company mounts on a bulletin board each pair of broken goggles and the object that broke them. Most of them come from men and women on jobs where the operation does not seem dangerous to the eyes. At least one large manufacturing concern requires goggles on every job, and visitors must put them on before entering the plant. This company saved itself \$116,000 in 2 years by this requirement. More important, it saved at least 100 eyes in a period of 10 years.

Among the jobs where goggles should be used are upholstering and sewing-machine and grinding operations. Goggles have saved more than one eye from broken needles in sewing occupations.

Wear a Cap Around Moving Machinery

In a Government arsenal employing many women the statement was made recently in answer to a Women's Bureau inquiry that a woman's hair is the greatest hazard in her employment on machinery. It is possible for the electrical attraction in moving



machinery to draw free hair into the machine (as a brush draws the hair after brushing), with very terrible results. For this reason a net should be worn or the hair should be cut short.

After years of experiment a company employing many women at work with revolving machines, and some in dusty operations, has decided on a uniform head covering, attractive in appearance as well as efficient in protection.

Two problems are present—confining the loose hair and preventing the possibility of revolving machinery catching in the hat and then in the hair. The distinctive features of the cap decided on are its height (the top does not touch the girl's hair) and its stiffness (it will not catch in revolving machinery). The head size is not small, so the hat would be thrown off if a girl did strike a piece of machinery. One girl, after wearing it at her machine operation for several days, remarked that she never before had realized how close she was working to her machine. The touch of the cap warned her she was too close.

Wearing a net to cover all the hair and hold it close to the head may be necessary where a girl has a lot of hair and the hat does not entirely cover it.

In this company the management arrived at the best solution to its hat problem by cooperating with the girl at the machine on questions of design, material, and comfort. Suggestions for such a uniform headdress can be given by the workers after the problem is outlined to them.

After careful consideration, the National Youth Administration has adopted a cap for its girl employees in factory work. This cap is visored to shade the eyes, is full so that all the hair may be covered. It is light, comfortable to wear, and washable.

In jobs where dust of any kind is present, and they are many,



Courtesy Pittsburgh Plate Glass Co.

Fig. 2.—Head scarf for protection against harmful dusts.

a well-fitting cap of closely woven, easily laundered material adds to comfort and health. The head covering in figure 2, designed to protect the hair and scalp from soda bicarbonate used in certain operations, is made of white batiste in the shape of a triangle and hemmed on all edges. Wrapped around the head and tied in front, it furnishes complete protection.

Work Dress Must Suit the Job To Be Safe

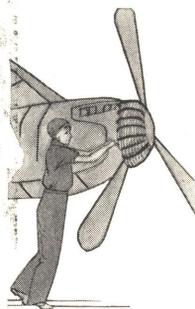
The time has passed when clothes selected for the Easter parade may eventually become work clothes, no matter how unsuitable. Tight-fitting garments cause strain that increases fatigue. Loose, full dress around moving machinery invites serious injury.

The girl working in airplane repair should wear slacks and blouse with short cuffless sleeves, or short-sleeved coveralls, to give freedom of movement without danger of catching on protruding equipment.

A similar uniform is necessary for the woman working near any moving machinery. It may be slacks and blouse, coveralls, or one of the various types of knicker suits that have been designed. The important things to remember when dressing for work at or near moving machinery are no loose sleeves, no full skirts, no ties or frills to catch in moving parts. (See frontispiece.) Both slacks and sleeves should be made without cuffs. Long sleeves rolled up are even more to be shunned than cuffs; the loose roll caught in a machine is most resistant to tearing and a serious arm injury may result. Pockets are to be considered, too, and no outside pocket at all is the safest rule. If an outside pocket is necessary, the Bureau of Home Economics advises a flat-seamed pocket or flat hip pocket.

On bench assembly work and other factory work without special hazards, either a simple well-fitting short-sleeved dress or slacks and blouse like that in figure 3 are appropriate. Freedom of movement spells comfort and efficiency in any work. Pleated backs in blouses and well-cut garments contribute to freedom.

A special dress for work is necessary, too, where there is dust or other soiling agent. Protecting the street clothes of men and women working with chlorinated naphthalene in the manufacture of insulated wires and electrical condensers was found essential to prevent cases of serious skin eruptions to young children and other members of the workers' families. Uniforms highly starched prevented absorption of the poison. In case of any



poisonous dusts, exposure time is doubled by carrying the poison around on street clothes.



Courtesy National Safety Council.

Fig. 3.—Well-cut slacks and blouse spell comfort and safety while working near machinery.

With some materials skin contact is known to be a more important cause of poisoning than respiration or digestive contact. Street clothes must never be contaminated by such materials.

For the comfort of women who must work in cold places a ski type of trousers has been devised of warm material, fitting well about the ankles and topped by a closely knitted sweater.

Hand Coverings Can Prevent Skin Infection and Other Injury

Work gloves must be chosen for the job in which they are to be used. They must be comfortable and durable, as well as protective. Gloves are more than a decorative accessory for the woman in industrial work. Protection of the fingers and hands can go a long way in cutting down the number of injuries to women. Hands and fingers are used in practically every operation connected with earning a living. Even a slight accident to the fingers can completely disable a worker for the occupation that requires nimble fingers and accurate handling of small parts. According to some State reports, approximately half of all occupational injuries to women affect hands and fingers. Gloves can furnish adequate protection in many cases.



Much assembly work requires handling sharp or rough objects. An ordinary durable glove of inexpensive type will mean comfort and safety in this kind of work. Where the parts handled are small, rubber finger guards may be sufficient. Adhesive tape so often seen around the workers' fingers is a poor substitute, since its constant use has a harmful effect on the skin and may even be the cause of a definite irritation.

An operator handling sharp particles wears hand protectors of leather such as goatskin to protect her hands from the minute chips. Rubber finger guards are worn to make it easy to handle the small parts.

Figure 4 illustrates the need for gloves in another operation at which many women work—inspection of tin plate.

Hands are most often affected by the skin diseases caused by a great variety of substances used in industry. Gloves made of fabrics that absorb moisture may become so saturated with the harmful substance that they are worse than no gloves.

The United States Public Health Service has studied fabrics to find satisfactory protection against such harmful materials. As a result they recommend as the most suitable protection against skin irritants Pliofilm, Vinylite, and Koroseal. These materials prevent the irritants from coming in contact with the skin and they have the advantage of not being inflammable.



Courtesy Carnegie-Illinois Steel Corp.

Fig. 4.—Leather gloves and apron used in tin-plate inspection.

They are easily washed with soap and water. With ordinary care they will last for months in rough occupations. In gloves they have an elasticity like rubber, without the clammy feeling of rubber. They can be used where rubber would be attacked by the chemicals used, or where the worker is allergic to rubber itself. Rubber has other disadvantages, aside from its uncomfortable feeling; it is heavy, tears easily, and may cause dermatitis in susceptible workers.

Protective hoods, sleeves, gloves, and aprons of this type of material may be worn. Sleeves should fit snugly over the gloves so that wrists as well as hands are protected. Such protection is especially helpful where objects are lifted above shoulder level and may run down onto the forearm, or where material may collect on the edge of the glove and be rubbed into the wrist.

Gloves used in working should be considered carefully from the point of view of comfort. Leather gloves particularly should be checked for heavy rough seams or rough edges. Continual irritation of the skin opens the way for infections.

Gloves are used more than any other single item of protective clothing, but around moving machinery a glove is as taboo as a necklace or a ring. Serious accidents have been caused by wearing gloves while operating drills, punch presses, lathes, and other machines. It is a temptation to wear gloves because of the frequent contact with oil and greasy objects. Substitute protection is available for such occupations in the creams and varnishes on the market. No one cream or varnish is suitable protection for all substances, and the best method is to use the specific type of protection advised for each general group of irritants. In many cases pure lanolin or a cream with a lanolin base is adequate. Examples of mixtures requiring special protection include chlorinated solvents, gasoline, chemical mixtures; turpentine; alcohol; turpentine and hydrosolvent mixtures. For such mixtures advice about the protection to use should be given by the plant physician.

An important consideration when a cream or varnish is used for protective covering is that it may be washed off with a suitable soap cleanser.

Jewelry Has No Place in the Factory

No jewelry is suitable for factory wear. The useful wrist watch, the frivolous earrings, necklaces, rings, and bracelets, though attractive in themselves, have no place in the factory. Some companies make definite rules that no visible jewelry may be worn.

Jobs With Special Dangers Require Special Kinds of Work Clothing

Safety clothing now provides protection against almost any hazard in any type of work. The worker dressed specifically for her job is safety conscious and less likely to have an accident.

The following list indicates the particular personal equipment necessary in cases of exposure to the hazards listed:

| <i>If the hazard is—</i> | <i>The worker should wear ¹—</i> |
|---|--|
| Corrosive substances, alkalis, or acids. | Coat or apron of rubber; rubber or chrome leather shoes with wooden soles and, in case of corrosives, with sewed sole; arm and leg protectors of glass-fiber cloth; fiber-metal alloy, or rubber; gloves of rubber or rubberized cotton; rubber hat or hood. |
| Cuts | Chrome leather is advised for coat, apron, shoes, leg and arm protectors, and gloves. Metal mesh may be necessary in apron and in arm and leg guards, and gloves may be of canvas, metal mesh, or cotton. Head covering may be of plastic composition, duralumin, or vulcanized fiber. |
| Dermatitis | Clothing of rubber. May necessitate coat or apron, shoes, arm protectors, gloves. |
| Falling objects | Shoes with reinforced toes; arm and leg protectors of fiber-metal alloy; head covering of plastic composition, duralumin, or vulcanized fiber. |
| Falls or slips | Shoes with nonskid soles. |
| Flying particles | Same as for punctures and blows (which see) with the exception that shoes with reinforced toes and metal-mesh or cotton gloves are not necessary, and in some cases an asbestos coat or apron would be preferable to one of leather. |

¹ Where rubber is listed, one of the substitutes such as discussed on page 7 may be used.

If the hazard is—Con.

The worker should wear—Continued

- Hot liquids**..... Apron or coat of chrome leather; shoes opening at the side and made of chrome leather; leg and arm protectors of fireproofed duck; asbestos or chrome leather gloves; rubber hat or hood.
- Hot materials**..... Asbestos coat or apron; wooden-soled, chrome leather shoes without front lacing; asbestos arm or leg protectors, gloves, and hat or hood.
- Moisture**..... Rubber coat or apron; chrome leather or rubber shoes; arm and leg protectors of chrome leather or rubber; gloves of rubber or rubberized cotton; hat or hood of rubber.
- Punctures and blows;
rough, sharp,
objects.** Chrome leather shoes with reinforced toes; coat or apron of chrome leather or wire mesh; leg and arm protectors of leather or fiber-metal alloy; gloves may be chrome leather, metal mesh, or cotton; necessary head covering of plastic composition, duralumin, or vulcanized fiber.
- Spark explosion**..... Shoes with sewed or wood-pegged soles, copper-nailed heels.

Leg protectors include spats, leggings, pants, knee pads.

Arm protectors include sleeve and wrist protectors.

Gloves include also mittens, hand pads, finger guards.

Hats include hoods.

(Material in this list adapted from chart by the American Mutual Liability Insurance Co.)