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Enclosed blast rooms with down-draft exhaust ventilation and the use of supplied-air respirators have minimized hazards of abrasive blasting.

Protection Against Contaminated Atmospheres

By BENJAMIN F. POSTMAN

PROTECTION against contaminated atmospheres represents a narrow but vitally important band of personal protection. This discussion will include protective devices available for normal industrial operations, but not equipment for mine rescue or fire-fighting purposes.

Air Supplied Helmets

Until the appearance of the air-supplied helmet, one of the most serious exposures was in the casting cleaning or blasting room where sand-mold castings were cleaned of adhering molding sand. For years this was the lowest paid and dirtiest job in the foundry. Six months exposure in a blasting room where silica sand was the

only type of abrasive used—utilizing either a rag or handkerchief about the nose and mouth for protection—was all that was necessary to produce a case of disabling or third stage silicosis within 15 or 20 years.

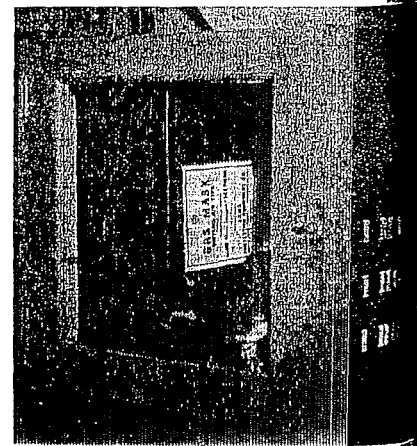
It is, therefore, with a feeling of reverence that we inspect a modern air-supplied helmet, because, if properly used, operators in casting cleaning rooms will not be exposed to any dangerous concentration of silicious dust. The use of steel grit or shot has further reduced the potentiality of silicosis. To be sure, the use of a supplied air helmet protects the operator irrespective of the type of abrasive used.

At present there are fifteen types of helmets, produced by eight different organizations, which have been approved by the U. S. Bureau of Mines. Incidentally, it is to be emphasized that the types of respiratory protective equipment mentioned refer only to equipment ap-

proved by the U. S. Bureau of Mines. Those who purchase, or supervise the use of respiratory protective equipment should insist on "approved equipment."

Blasting helmets are costly. Operators should be instructed not only how to use them, but how to store them when not in use. The greatest abuse seen in the field is

Supplied-air respirator and rope kept on side of degreasing tank. Air flow to this type of respirator should not exceed 20 feet per minute.



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a helmet thrown into a corner of the blasting room or on some sharp-edged castings. Some helmets are provided with suspension rings at the top of the head section, so that it may be suspended from a hook when not in use.

All air supplied to helmets should pass through a filter unit to remove oil fumes, moisture and other nuisance or toxic constituents common to compressed air lines. Some years ago, an operator in a blasting room was found dead, presumably from carbon monoxide which was generated when oil lubricated valves on a compressor became inoperative. This was the only answer advanced for this death. A fatality of this type is extremely rare.

As a result, some blasting helmets are provided with air from separate pressure blowers, utilizing shop or outdoor air. One such unit, called a clean air blower, not only compresses the air for the helmet but cools the air to remove the heat of compression, and then wastes and humidifies this air.

Where helmets or other types of air-supplied units receive air which is too cool, creating a chilling effect on the head, neck or face of the operator, an air-line electric heater may be provided to heat this air before it enters the helmet or mask.

Data relative to the normal air supply for each type of helmet should be obtained from the manufacturer. The wearer of the helmet should be instructed to regulate the air supply valve so that at all times he will receive an adequate supply of air for breathing. Air ranging from 3 to 8 pounds per square inch in pressure will provide from 6 to 20 cubic feet of air per minute to the helmet.

Dust Respirators

It is difficult to force personnel to wear any type of respiratory protection. Personalized indoctrination relative to the reason and necessity for wearing respiratory protection is sometimes a normal and/or a basic necessity. Use of respiratory protection for more than one-half hour at a time is not desirable. However, during a recent survey of a casting cleaning room, all operators using portable grinding units wore safety goggles and approved dust respirators all day long.

Local exhaust, either downdraft through floor grilles or on benches along the wall for the various sizes of castings, would considerably reduce exposure to excessive dust concentrations resulting from the use of portable grinding units. In another casting cleaning room, all of the operators wearing approved



Workers at Ferro Machine and Foundry, Inc., make full use of protective equipment. This swing grinder is wearing filter respirator, face shield and goggles.

dust respirators looked like dogs frothing at the mouth, due to the saliva dripping from the exhaust valve of the respirator.

Though portable grinding is considered a heavy-duty operation, an analysis of excessive labor turnover may determine the cause due to unfavorable operating conditions and not due to a lack of pay.

It should be remembered that the dust produced from the abraded wheel, which may be aluminum oxide or carborundum, with castings of grey iron or steel, are so-called nuisance dusts which do not produce silicosis or tuberculosis. When bronze or brass castings are processed, there is a potential lead exposure. However, the continual heavy dust concentrations produced by uncontrolled portable grinding units may aggravate a sinus, bronchitis, or asthmatic condition, which may become compensable. The liberality of some awards, based on ag-

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The best equipment may be useless in an emergency if employees are not instructed in its use. These employees of a public utility company are receiving instructions in respiratory protection.

that he had extremely high blood pressure with dizziness, headaches and other symptoms referable to hypertension.

Following preplacement examination, the personnel manager of the hotel was advised that this man was not physically qualified for employment as a window cleaner.

Good general evidence of the value of industrial medical care may be found in a study involving some 3,500 plants, made by the National Association of Manufacturers in 1951. The surveyed companies, representing every section of the United States, constituted a wide range of sizes and types. They reported the following average savings from medical care programs, which at first may seem too good to be true:

- A 44 per cent drop in accident frequency;
- A 46 per cent drop in occupational diseases;
- A 29 per cent drop in labor turnover;
- A 39 per cent drop in absenteeism;

A 30 per cent drop in compensation insurance premiums.

The keystone of any worthwhile program is a provision for replacement and periodic physical examinations. Reasons:

1. Such a set-up minimizes the hiring of persons for jobs they are not physically equipped to fill.

2. It enables an employer to place handicapped persons where they are most suited.

The first point is obviously a big factor in avoiding accidents. The second is of special importance these days, when a tight labor market makes industry rely more and more on elderly and physically handicapped persons.

Respiratory Protection

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gravation factors, is becoming a serious problem.

Workers should not be required to wear respirators for long periods. If this type of protection is necessary, then an analysis should be made of the operator technique

and/or the job requirements. Invariably a change in one or both is found necessary.

A preventive cleaning, sterilization and maintenance program should be developed for all respirators used in a plant. This should not be left to the individual worker. A program of this sort is feasible in a moderate sized and large plant, but it has its inherent difficulties in the smaller plant. For this set-up, one intelligent operator may be assigned to this work, possibly with some extra compensation as an incentive.

Chemical Cartridge Respirators

In all cases, facelet cloths should be provided for all types of respirators as a means of reducing face rash in hot weather. Creams applied to cheek areas are also desirable, and should be provided for all personnel who use respirators.

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