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IMPORTANT

professional protection magazine

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DIESEL EXHAUST PROVEN To INCREASE LUNG CANCER
— American Study

[Translation from Arbetsmiljoe 10/88)

"This is the first time it has been proven that the risk of lung cancer is increased by exposure to diesel fumes," says Thomas J. Smith from the University of Massachusetts who, together with Eric Garschick at the University of California and others, has put together this study.

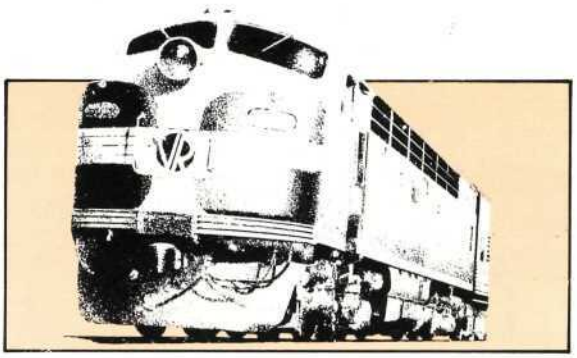
Diesel exhaust contains soot particles which are carriers of mutagenic and carcinogenic substances. This has been a well-known fact for some time. The particles are deposited in the lungs when inhaling the exhaust fumes,

The American research project examined 55,407 railway workers who were aged between 40 and 64 in the year 1959, and who had started employment with the railways between ten and 20 years previously. The US railways use diesel fuelled engines.

The group was further divided into job categories and exposure to diesel fumes. Staff travelling with the train and those who performed repairs were exposed to fumes, while ticket sales staff and clerical workers were not.

Journeying staff were exposed to 71-141 micrograms/m^3 of diesel fumes, while the maintenance crews worked in 82-330 grams. In general, the exposure was minor, according to Thomas Smith.

The study also took smoking habits into consideration. People who had been



working with asbestos were excluded from the project.

The study found that nearly 20,000 of the group had died by 1980. 1,694 had died of lung cancer.

The risk of dying from lung cancer was increased in proportion to the years spent working in diesel fumes. The maintenance staff was in the highest risk group.

The cancer risk increased by 72 per cent for those who had been exposed for 15 years or more. For workers with one to four years' exposure, the risk increased by 20%.

The study included statistics of the group after the maintenance workers had been excluded. The results still showed an increased risk of lung cancer for the remaining exposure group.

Source: American Review of Respiratory Diseases

IN THIS ISSUE:

SOLVENTS AND BEHAVIOURAL CHANGES
— A medical view

Since Dr. Bill Glass of Otago University started a project on the possible behavioural effects of solvents, he has had many first hand experiences with people who complain of mysterious mood changes toward the end of the working week, People came to Dr. Glass telling of insidious behavioural changes which made them aggressive, irritable, indifferent to work, family and life. Some had suffered such great mood changes that girlfriends and spouses had either broken off or were greatly concerned about their relationship. Others, who had normally been conscientious workers and enthusiastic about their job, had gradually lost their interest in work.

Dr. Glass has undertaken a survey on solvent exposure at work over the last six months. He believes that the complaints are work related, and that such mood alterations may be much more common than previously estimated.

There are many common factors that tie the patients together into one single group, and reinforce Dr. Glass's suspicions. Solvent exposure is one of them. The fact that the symptoms become worse towards the end of the working week is another.

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Solvents used to be more or less confined to a handful of professions, including painters, printers, dry cleaners and degreasers. Nowadays, however, there has been a "solvent explosion": solvents are used in countless operations and for innumerable purposes. The result is that solvent exposure is one of the most common problems in today's industry.

How could solvent inhalation lead to behavioural afflictions and personality changes? Dr. Glass says that most of the body's vital organs are affected by solvent exposure, and the brain is one of them. The brain is a vulnerable organ, with many sensitive functions such as memory, emotions, sleep control, and intellectual capacity.

Other important organs include the blood-producing bone marrow, the liver, the kidneys — all of which may show a deterioration after repeated exposure to solvents. It has also been shown that solvents may affect the unborn child in pregnant women, Dr. Glass says.

SYMPTOMS

Immediate effects usually include dizziness, drunken behaviour, nausea and headache. If exposure is severe, heart failure may follow.

Delayed effects are the real object of Dr. Glass's research: these include the characteristic personality changes and mood swings, particularly occurring at the end of the working week, or after long periods of exposure to solvents.

Long-term effects include bone marrow damage (benzene, for instance, has been established as a carcinogen, and to cause blood cancer in certain circumstances), kidney and liver damage, damage to the embryo, and permanent brain changes.

HOW TO DEAL WITH THE PROBLEM:

- ☐ Educate managers, foremen and workers to gain thorough knowledge about the effects and characteristics of solvents, and in the use and maintenance of breathing equipment.
- ☐ Install mechanical ventilation.
- ☐ Implement a respirator program. Ensure that the right type of respirator is used, that the filter is made for the particular solvent, and that the filter capacity is high enough for the duration and strenuousness of the work performed.
- ☐ Establish whether solvents are present in vapour or aerosol form. Gas filters ONLY protect against vapour: if the

solvent is in aerosol (mist, fog) form, a combined particle/gas filter must be used.

D Prescribe supplied air equipment for all enclosed areas. Remember that a life harness must be worn, and that one or two people must be on constant standby.

☐ Make regular medical checks by a health professional. Monitor general well-being, as well as blood and urine.

CONCLUSION

Dr. Glass's opinion is echoed by many scientists in Europe, where a number of research projects are planning to establish the true dangers of solvents, and to show how wide-spread they really are.

While solvents are often treated (and used) in the most casual manner, the severity of detrimental effects and possible consequences canot be overstated.

Source: Dr. Bill Glass, Associate Professor in Occupational Health, Department of Preventive and Social Medicine, University of Otago, New Zealand. Report published by N.Z, Dept. of Labour magazine, SAFEGUARD. October 1988.

. . . SOLVENTS NOT THE ONLY MOOD CHANGERS

CHEMICAL FOOD ADDITIVES have also been shown to cause emotional changes and alterations of personality. The chemicals can affect both children and adults, however, children seem to be most at risk.

For a reason yet unexplained, males are much more susceptible than females: up to ten times more cases occur in males.

Research shows that people who are sensitive to aspirin and salicylates also frequently show mental symptoms when exposed to food additives.

One of the world's foremost experts in the field, Dr. Ben Feingold, an allergist from San Francisco, first stumbled upon the connection between food additives and behaviour in 1965, when he treated a woman for severe skin allergy caused by artificial colours and flavours. He withdrew these substances from her diet. Not only did the patient's skin condition disappear, but her psychiatrist soon found that she had suddenly recovered from her psychological complaints: hostility, irritability, aggressiveness and difficulties in getting along with others.

As long as she stayed away from food additives she was in perfect mental health, but as soon as she deviated from her diet, she returned to her hostile behaviour.

Symptoms range from hyperactive behaviour, such as excitability, impulsiveness and distractability to depressive behaviour, such as low self-esteem.

Food additives have, like solvents, gone through an explosion-like growth of late. The California Association for the Neurologically Handicapped has estimated that in only ten years, incidences of hyperactive behaviour and resulting learning difficulties has increased from 2% to a full 25%, and in some groups, up to 40%.

It seems that artificial colouring agents, notably tartrazine (E102) play the most important role, followed by flavourings and preservatives,

PPM has been unable to find literature on workers in the food industry who may be exposed to food additives daily in a much more direct way. Whether colourings and flavourings could cause the same problems through inhalation or skin absorption is, to the best of our knowledge, not known.

Source: Food Chemical Sensitivity by Ph.D. Robert Buist, Harper & Row. 1987.

A health conscious chemist in Ryde
Went into a bistro and cried:
"It may sound unnerving,
But the sauce you are serving
Contains
triphenylphosphoranylidenesuccinic
anhydride!"

WARNING LABELS — DO YOU READ ME?

Anyone who works with chemicals, even uses detergents and cleaners at home, knows what a warning label looks like, But how often have you sat down and really studied the label?

We all recognise the yellow "DANGER" or "CAUTION" portion, and we have seen the familiar skull and cross bones symbol countless times, However, a properly designed and well written label contains a lot more information that could be of paramount importance.

Here are some hints on how to read labels and how to treat the information:

Read The Label Every Time You Use The Chemical.

Labels can look similar, and a mix-up is possible: you could be using the wrong chemical by mistake.

Read The Label Every Time You Replenish Supplies.

The manufacturer may have changed the blend of the product. New ingredients may have been added, changing the characteristics or hazard level of the chemical.

Understand The Label.

DO you really know what you need to know about the substance? You should know not only what it is used for and what it does, but also how it may affect you and the surroundings. Is it toxic? Flammable? Explosive? Corrosive?

Check Your Protection Equipment.

Make sure you have the right gear for the right chemicals. The material in gloves, aprons and boots may be of great importance. If a respirator is required, make sure it's of the correct type and fitted with the correct filters. Wear it at ALL TIMES.

Learn The Label.

Hazard information and emergency procedures should be noted. In an emergency, such as a spill, a poisoning case or a fire, you won't have time to study the label.

Don't Dispense Chemicals Into Dirty Or Soiled Containers.

If you re pouring smaller amounts into more manageable containers, make sure the container is clearly labelled.

Replace Torn Or Soiled Labels Immediately.

The full text should be legible.

Never Use Chemicals From An Unlabelled Container

unless you are absolutely certain of its contents.

Not All The Information You Need May Be Displayed On The Label.

For more exhaustive information, consult the Data Sheet on the particular chemical, which should be available from the employer or, if required, from the manufacturer.

Most Importantly: Read The Label!

It could be the most useful reading you'll do all day!

Source: Scriptographic series 18838A-9-87, Safety Concepts (distr.) 1987.

QUESTIONS AND ANSWERS

How do I know whether to use a filter respirator or a supplied air device?

A. K., Deniliquin

There are a number of factors that can influence the choice between filter respirators and supplied (compressed) air equipment.

First of all, there is the maximum capacity of the filter. For this, you'll need to know the TLV, (threshold limit value) of the particular contaminant, and the concentration of the substance in your working environment. Depending on whether you use a half mask or a full mask with a filter, you'l! know if the filter has the capacity to cope with the atmosphere (usually 10 times TLV for half masks and 50-100 times TLV for full masks).

Other factors that would PRECLUDE the use of filter respirators include:

1) If the atmosphere contains less than 20% of oxygen. This may be caused by depletion of oxygen (fires, burning, etc.), displacement (by gases that are heavier than air), or in locations where dust, mist, fog or smoke generation is excessive.

2) If the atmosphere contains an unknown contaminant.

3) If the contaminant is immediately dangerous to life and health (IDLH).

4) If you are unable to achieve adequate protection due to facial features, beard growth, skin conditions or other reasons. The best way to make sure is to go through an individual quantitative mask test. A simple way of testing is to block the filter intake with a plastic bag, breathe in and hold your breath, You will feel the mask collapsing and pressing tightly around your face. If the mask returns quickly to normal, there is a leak somewhere.

Remember that you should NOT use a filter respirator if you're working in a tank, drum or cistern. Wear a life harness, and make sure there is an assistant standing by on the outside to haul you out in case of an emergency.

If the atmosphere contains any of the following substances, it is recommended that you do not wear a filter respirator:

Dinitrogen oxide (laughing gas)
Ethylene oxide
Ethyl Chloride
Freons
Carbon dioxide
Carbon monoxide
Nitrogen dioxide
Nitrogen oxide
Methyl bromide
Methyl chloride
Nickel carbonyl
Ozone

Source; Information from Sundstrom Safety AB, Stockholm, Sweden, and Sydney, Australia, 1988.

DO YOU HAVE A QUESTION?

Please send us your queries on work safety. Fill in the coupon and mail to:

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P.O. Box W110
Warringah Mall NSW 2100

My question is: . . . . . .

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Name: . . . . . .

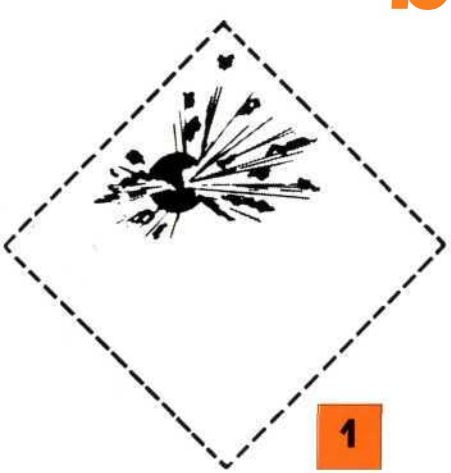
Address: . . . . . .

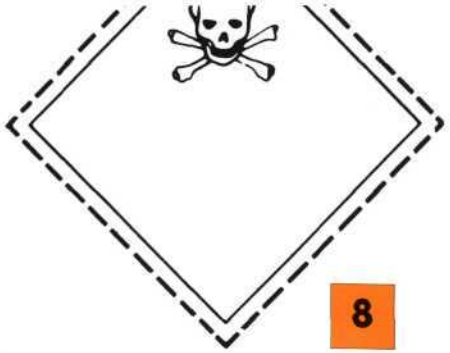
. . . . . Pcode: . . . . . .

☐ You may publish my name
D Please use the following signature . . . . . .

SHOW YOUR TRUE COLOURS!

— and win a colourful prize to brighten up your day!





You've seen them all before . . . on containers, drums, tins, labels and sides of trucks. The characteristic UN diamonds that signify the particular hazard of a chemical.

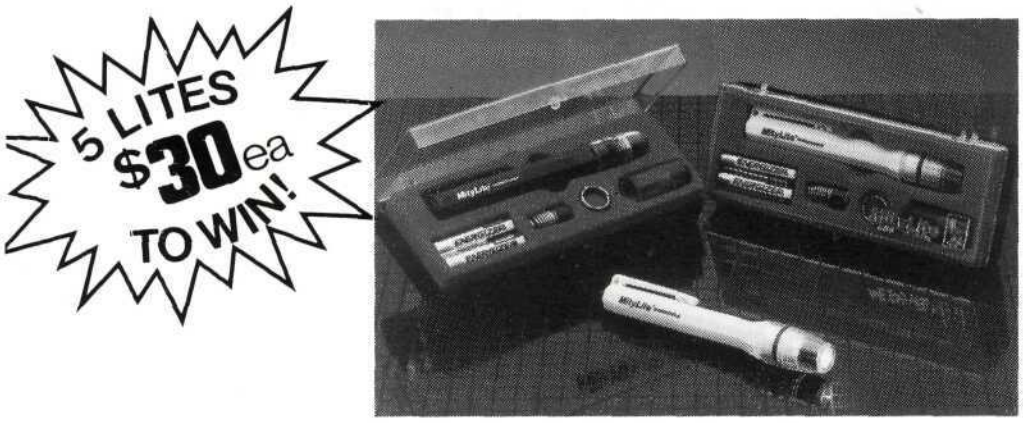
But what colour are they?

Test your own skill by looking at the black and white versions, and then matching the respective number with the correct colour on the coupon on page 8.

*You could win one of five travel kits of **MityLite** — the world's finest **Xenon-fired torch.***

SAFETY COLOUR COMPETITION

WIN A POWERFUL MITYLITE



Don't miss out!

Send in the coupon (or a photocopy), and you could win a practical and powerful MityLite — the world's finest Xenon-fired flashlight, so powerful, yet so small. Great for the car, garage or garden shed. The travel pack includes Premium Alkaline batteries and spare parts for this bright invention. The pre-focussed light is waterproof, intrinsically safe, and extremely bright without disturbing ripples in the beam.

Entries should reach us before January 31st, and the winners will be announced by mail and published in PPM

Send your entry to:

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P.O. Box W 110,
Warringah Mall NSW 2100.

Number:	Hazard:	Background colour:
.....	Oxidising substance	_____
.....	Flammable solid	_____
.....	Emits flammable gas in contact with water	_____
.....	Toxic substance	_____
.....	Explosive	_____
.....	Radioactive class I	_____
.....	Flammable liquid	_____
.....	Radioactive class II	_____
.....	Corrosive substance	_____
.....	Liable to spontaneous combustion	_____
.....	Compressed nonflammable gas	_____
.....	Radioactive class III	_____

Name: _____
Position: _____
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Telephone: _____

OCCUPATIONAL ASTHMA
— widening its spread

Work-related asthma is a serious condition indeed. Asthma affects your life and well-being more than many other afflictions. It is a condition which may be very difficult to live with and impossible to come to terms with.

In serious cases, asthma is a killer disease, and every year people die from it.

What is asthma? In short, it may be explained as a reduction in the diameter of the bronchi. By muscular contraction, this reduction hinders the passage of air, and sometimes closes it off entirely.

The bronchial "tightening" is caused by various agents that are triggered by allergic reactions, physical irritation, neurogenic phenomena, or pharmaco-dynamic agents.

In addition to the blocking of the bronchi, there is also hypersensitivity and inflammation of the mucous membranes. The hypersensitivity can render the asthmatic person extremely susceptible to the particular substance, and even minute amounts may cause a severe attack.

Occupational asthma is often connected with other allergic reactions, such as hay fever, rhinitis, coughs, etc. What makes it a work-related illness is that it is brought about by single or repeated exposure to substances present in the working environment.

SYMPTOMS

An asthma attack often starts after work, sometimes in the evening, often at night, most commonly in the early hours of the morning. The asthmatic usually wakes up with an initial sense of anxiety — even panic — coupled with pressure about the chest, coughing and a runny nose. The impaired breathing is further compounded by phlegm and secretion. Acute asthma attacks may require urgent resuscitation and emergency medical assistance.

Treatment is difficult. Antihistamine and other preparations (such as the common inhalation spray tubes] may be used to milden the attack and relieve the breathing impairment — but these are only used for symptomatic treatment. In order to treat the asthma itself, immunological desensitising treatment is necessary. However, this may prove very difficult and, in some situations, downright dangerous. Many people are left to live with their condition for the rest of their lives.

PREVENTION

The main effective means of prevention is to examine which airborne particles are present in the workplace, and then to determine whether these particles are capable of causing asthma. If so, radical steps should be taken to a) replace the substance with a non-allergenic one, b) engineer out the problem through mechanical exhaust, improved ventilation, etc., and cj determine the type of respirator needed, and make sure that all workers wear one.

WHEN IS ASTHMA OCCUPATIONAL?

This question is often a "hot potato", because it is not always possible to clearly define the cause of the illness. The presence of the allergen may not be clear-cut, for instance, if the asthma is triggered by a substance that occurs in high concentrations at work, but also is generally dispersed elsewhere.

To our knowledge, conclusive guidelines have yet to be determined. However, here is a short list of normally accepted criteria as to what is — and what isn't — occupational asthma:

ASTHMA IS OCCUPATIONAL:

1) When there is only one trigger substance, and that substance occurs at work, and the asthma disappears when work is stopped.

2) When an irritant substance causes the asthma, and the asthma disappears when the occupation is terminated or changed.

3) When the person is sensitive to a substance that occurs both at work and at home, but does not experience asthmatic attacks after finishing work. In this case, the asthma is still regarded as occupational, because the work environment creates the additional exposure that results in an attack.

4) When the person is sensitive to a substance not present at work, but whose attacks are created by an irritant found at work. This is still treated as occupational asthma, because the patient recovers after leaving work.

. . . BUT *NOT* OCCUPATIONAL:

5} When the asthma attacks do not disappear after work is relinquished.

The list of asthma-producing substances is already very long, and growing rapidly. Here are just a few well-known agents of occupational asthma:

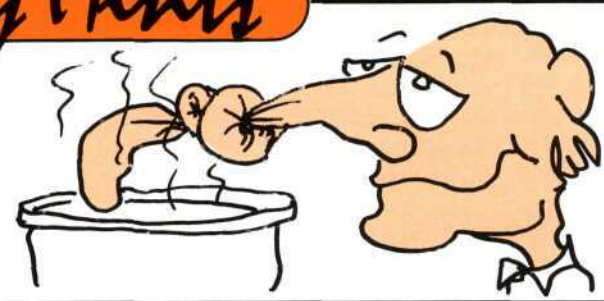
- Acrylic fibre
- Alkyl phosphates
- Aliphatic aldehydes
- Aliphatic amines
- Ampicillin
- Azo dyes
- Barley
- Budgerigars
- Carbamates
- Castor Oil
- Cats
- Chlorine
- Chlorthion
- Chromium
- Cobalt
- Colophony fumes
- Cotton
- Cows
- Diazinon
- Diazomethane
- Diethanolamine
- Diethylene diamine
- Diethylene triamine
- Dogs
- Epoxy resins & hardeners
- Ethylhexylamine
- Flour
- Formaldehyde
- Grain
- Ground nuts
- Gum arabic
- Hair, feathers
- Hemp
- Henna
- Insecticides
- Jute
- Lead
- Liquorice
- Mercury diphenyl
- Mercury, organic compounds
- Metampicillin
- Mites
- Mould
- Cats
- Organic isocyanates
- Organiphosphorous compounds
- p-Dichlorobenzene
- p-Formaldehyde
- Penicillin
- Persulphates
- Pesticides
- p-Phenyldiamine
- Phenyl-formaldehyde resins
- Phenylglycine
- Phenylhydrazine
- Phosphoramines
- Phthalic acid
- Piperazine
- Platinum salts
- Polyamides
- Polyesters
- Proteolytic enzymes
- Pyrethrum
- Quinine
- Rice
- Rye
- Sericin
- Silk
- Soya
- Textiles
- Toluene diisocyanate
- Triethylene diamine
- Triethylene tetramine
- Trypsin
- Urea-formaldehyde resins
- Vanadium
- Vanillin
- Welding fumes
- Wood
- Wool

Sources: Encyclopaedia of Occupational Health and Safety, International Labour Office, Geneva 1985; Black's Medical Dictionary, 35th ed,, London 1987; Chemical Hazards of the Workplace, Proctor and Hughes. Philadelphia 1978.

Handy Hints

YOUR NOSE COULD FOOL YOU

Never think that you can tell when a filter is exhausted by smell. Some chemicals may numb your sense of smell. Others have a TLV that is lower than the smell detection level.



AN ALTERNATIVE To
ISOCYANATE PAINT

In PPM, we have always recommended that one of the first things to do about a hazardous substance is to try to replace it with a less harmful one.

The Dutch company, Sikkens, have recently released a new type of car lacquer that does not contain isocyanate solvents. The new products have been tested for six months in several car refinishing plants, and have shown some remarkable characteristics.

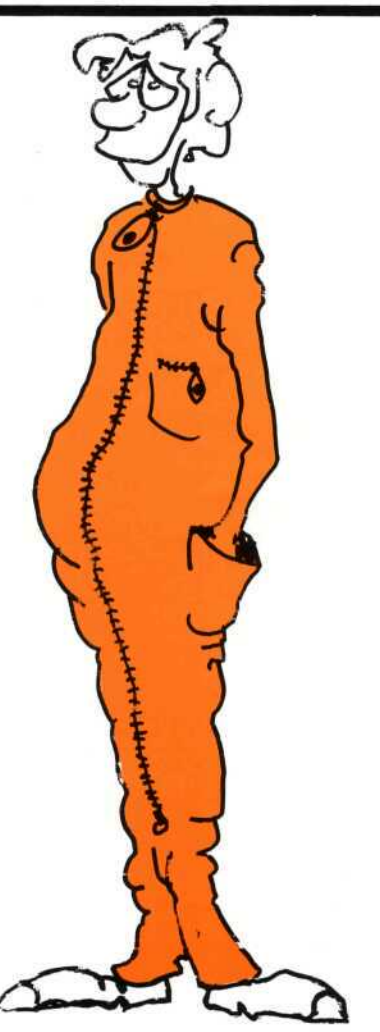
Apart from the obvious elimination of occupational asthma from isocyanates, the new paint also presents some technical benefits, including better coverage, shorter drying time, better surface sheen, and improved polishing ability.

Moreover, only two coats are needed instead of the usual three, which not only means increased efficiency, but also cuts down on the amount of solvent vapours in the air.

Source: Arbetsmiljoe (Working environment) 9/88, through "Motorbranschen" (Swedish motor **trades** magazine).

Handy Hints

Never use solvents to clean your respirator. Use warm soapy water or specially prepared cleaning tissues. Air dry and store in a clean place at room temperature.



HAS YOUR ZIPPER GOT THE SPARK?
Good quality flameproof overalls should also be antistatic and have non-spark zippers. Does yours?

WRITE TO US!

Questions, queries, views, suggestions, comments? You're always welcome to write to us about safety in general and breathing protection in particular.

Write to:

The Editor, PPM
C/- Sundstrom Safety (Aust.) Pty. Ltd.
P.O. Box W 110
Warringah Mall NSW 2100

DPM sends our heartiest well wishes to all our readers. Have a prosperous, healthy and safe 1989!

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