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DIESEL AND LUNG CANCER: UPDATE

Our article on Diesel exhaust and cancer created unprecedented interest from readers: countless copies of the original source material were faxed or mailed to interested ppm subscribers. What follows is a brief abstract from the Occupational Medicinal Clinic at the Regional Hospital in Linköping, Sweden.

AMERICAN COHORT STUDY ON DIESEL EXHAUST AND MORTALITY •

An American cohort study on this subject has been running since 1982. The study takes in the general population, and is performed through a questionnaire system. The current gathered information covers some 1.2 million men and women. The subjects have been questioned about their work, lifestyle and general sickness.

An analysis of the effect of occupational diesel exhaust exposure on men in the 40-79 age bracket whose smoking habits have been established, has now been concluded.

The relative risk (RR) of lung cancer was 1.7 among non-smokers, 11 among ex-smokers and 20 among smokers who had been exposed to diesel exhaust in their work,

as opposed to "other professions". Moreover, the study concludes that there is a connection between diesel exposure professions and death due to cerebro-vascular disease (RR = 1.6), arteriosclerosis (RR = 3.1), and cirrhosis of the liver (RR = 1.8).

It should be noted that in at least one previous study, cardio-vascular disease in high diesel exposure professions has been described as a possible result of exposure to carbon monoxide.



Source: Bofetta et al, American Journal of Industrial Medicine, 14/1988 pp. 403-415

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AND THE WINNER IS...

The ppm Warning Label Colour competition had a big response from readers all over Australia and New Zealand.

We thank all of the participants, and congratulate the following lucky (and knowledgeable) winners:

Andrew Niven, Telecom, Ultimo

G. J. Dedman, Dept. of Labour, Bendigo

R. Pitt, Worsley Alumina, Collie

John Betts, Tamworth Agricultural Research Centre, Tamworth

Vince Moroney, Air New Zealand, Christchurch, N.Z.



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Handy Hints



STOP DANGLING!

When fitting and adjusting your respirator, make sure no excess straps are hanging loose. Tuck the ends in under the strap: If the loose ends get caught in something, the mask could be pulled off your face.

WELDERS AFFECTED BY LEAD

Welders who have been exposed to aluminium, lead or manganese fumes have been compared with welders who have not been in contact with these metals in a recent study, performed by the trio, Bengt Sjögren, Per Gustavsson and Christer Högstedt at the Swedish Work Environment Institute.

The welders who had been exposed to the metals during a prolonged period displayed significantly increased symptoms of memory disturbances, concentration difficulties, emotional disturbances, and other symptoms from those parts of the brain which are not controlled by will. The results were gathered from the workers' own replies to a questionnaire on neuro-psychiatric symptoms.

However, the scientists propose to perform clinical studies before submitting conclusive findings.

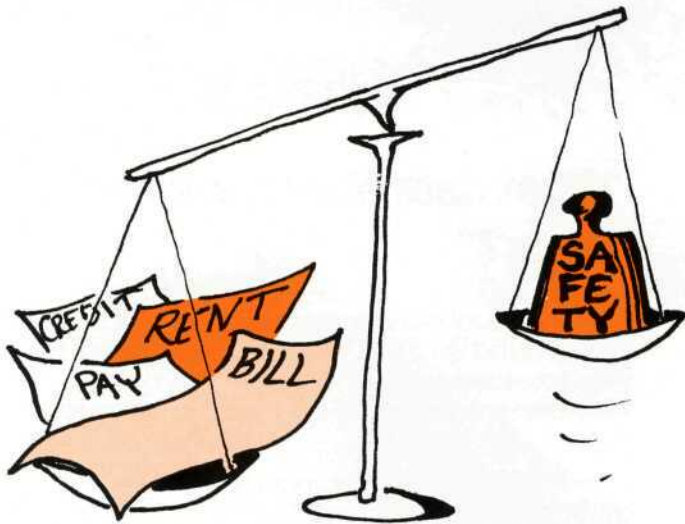


Bad habits!

Small businesses often find it hard to comply with the government's safety recommendations, rules and regulations.

Certainly, many comprehensive safety systems implemented by large corporations may be impossible to achieve for a small business. Still, many significant work hazards in small industries around Australia can be attributed to sheer negligence and downright bad habits.

Take a small car refinishing operation, for instance. There is no way a safety officer could be employed, and the foreman or supervisor doesn't have time, nor the knowledge to detect and eliminate each and every unsafe element in the workplace. Besides, speed and efficiency are paramount in a competitive market, and both staff and management have to pull together and burn the midnight oil in order to keep the company progressing.



What's more, official information is often scant: the repair shop may not know about safety hazards, whether existing or potential. Even if a hazard is acknowledged, it may be accepted as just "one of those things", and no-one would know how to implement the appropriate preventive measures anyway.

Another consideration is money: safety costs money. A small business means a small budget. New tools and machines seem infinitely more important than safety equipment.

But aren't these arguments really false economy? And if so, how false? There is no way of telling until the accident actually happens or the occupational disease really sets in.

Despite all the safety measures that could and should be taken, but which seem impossible to achieve by the small operator, there certainly are a number of simple actions that could be performed. Actions that would not cost a lot of money, would not take a lot of time, but certainly would make a much safer workplace.

Here are just a few simple — and downright stupid — bad habits that could be easily rectified at minimal cost:

- Storage cabinets for paints and solvents are small and not ventilated - ventilation holes are often covered to prevent the smell of the paint from escaping.

Open up the vents, that's what they are there for, and ensure good general ventilation throughout the whole premises. Make sure all containers are intact and properly sealed.

- Masks with carbon filters are stored in the open - only a few days in the solvent-rich atmosphere will render the filter useless.

Make sure that each worker stores his or her mask in a sealed bag or container, well away from vapours and fumes. Filters should be exchanged regularly. A mask with an old filter is worthless.

- Damaged tins, containers without lids, without labels, or with illegible labels are left in store.

All of these should be discarded immediately. Pour the chemical into new, clean containers with tight lids, or replace them with a new batch.

- Two-pack paint is stored and handled with casualness, and it is up to anyone to take a good sniff, knowingly or not.

In fact, normal handling of these substances usually requires supplied air equipment. This is dangerous stuff, and should be treated with respect and care.

- **Paints containing epoxy and isocyanates, causing allergies and lung damage, are simply left on the shelf.**

Learn more about these chemicals. Workers and management alike should know about the hazards of these products, and should know how to store, handle and use them in a safe manner.

- * **Inventories of hazardous chemicals or chemical data sheets on each hazardous substance are incomplete, missing, or have never been kept in the first place.**

When you're using potentially hazardous materials, it's essential to know what you are dealing with. Chemical data sheets give good information on protection, fire risks, explosion hazards, first aid and much more. Furthermore, they should come free of charge from the manufacturer.

- * **Safety regulations, precautions and handling instructions have not been communicated to staff.**

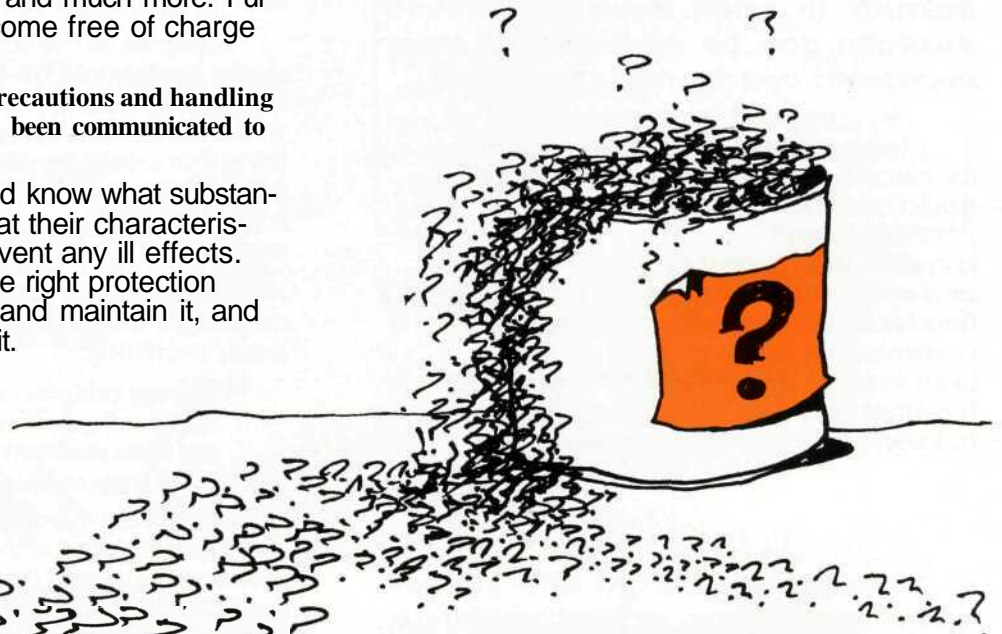
Every worker should know what substances are being used, what their characteristics are, and how to prevent any ill effects. Workers should have the right protection gear, know how to use and maintain it, and most importantly, wear it.

- **Lack of fire extinguishers.**

Even if the business is right next door to the fire station, a few extinguishers may make the difference between life and death - of the staff as well as the business itself.

- **Workers are used to their job, know their stuff, think that safety precautions are a waste of time, and that any talk of safe work procedures is a pain in the neck.**

Attitudes are hard to change. Still, workers have to understand that safety is not just confined to work: it is a 24-hour concern, and if you put your own health in jeopardy, you also putting your life with family, children and friends on the line. It really is worth protecting yourself.



"What data sheets? What ? labels?"

The usual story: someone gives you a tin in your hand and say, "Try this!". New, aggressive, timesaving glues, lacquers, oils, grease, fillers and solvents are field tested in order to improve the product.

A new, promising product may be an attractive item for a small business; even if it is unmarked, unlabelled, and not accompanied with a data sheet that outlines possible hazards, recommended handling and first aid. In some instances, employees may be used as guinea-pigs for new products without their own - or their management's knowledge.

Only when the employee starts to feel really bad, safety officers or supervisors are notified.

- **Refuse, spills and surplus is simply poured into a vat or 44-gallon drum - sometimes without lid - which is emptied infrequently.**

Solvents evaporate freely, thus constituting not only a significant health risk to all workers, but also a severe fire danger. Self-oxidising resins may be present among the waste materials, causing even greater concern about fire and explosion risk. Keep all waste under tight seal, and dispose of it regularly.

Large companies with in-house occupational health centres are usually coping well with the provision of safety information, training, data sheets, protection equipment, and information on the correct handling and use of products. However, small businesses may be lagging far behind in information, work place facilities, training and equipment.

- Handling procedures and hazard warnings for each chemical should be available and displayed in prominent place. This should not be a great problem for most businesses.
- An appropriate storage facility for refuse, surplus and spills should be established. Open drums are an invitation to disaster.
- Mixing, diluting of paints and cleaning of spray guns should be made in an appropriately ventilated place.
- Eye rinsing stations should be made available.
- General ventilation should be made as good as possible.
- An inventory of hazardous chemicals should be kept.



KEEP IN TOUCH!

Questions and queries; bouquets and brickbats; visions and views - you're always welcome to write to us about any safety topic. Please indicate if you do not wish us to publish your letter or your name.

Write to:

The Editor,
PPM Magazine
Private Bag 1001
Mona Vale NSW 2103

The Swedish Experience

The problem of chemical safety in small businesses is not confined to Australia - it seems to be a global phenomenon. Is it lack of money? Is it lack of information? Or is it plain laxness? In a recent article in the Swedish safety publication, Arbetsmiljö, several professional health & safety consultants gave their views and, sometimes, horror stories of what they saw in workshops around the country:

"It's surprising how many manufacturers supply un-marked products and don't bother about data sheets. And to find a company that puts out its own safety information is a unique event." (Lars Henschken, Work Inspection, Linköping)

"Smaller car refinishing shops don't know a thing about it. I have never seen a small shop where there is an inventory (of hazardous chemicals). There is no ringbinder with data sheets. Sometimes, data sheets are clipped onto the company's invoices, because they don't know what it is.

"Ever stronger degreasers, detergents and polishers are used. Epoxy glue is often used to affix metal parts. Toxic and flammable rust inhibitors are becoming more and more common.

"Most employees are young, between 18-30. You wonder what sort of damages they will carry with them to other work places." (Uwe Göpel, work health inspector, Stockholm)

Per-Einar Stark, occupational inspector in Stockholm, has perhaps the strongest and most poignant comment to make:

"Tins, jars and bottles are standing in a proper mess because of the cost of sending them to a treatment plant. Often, waste is poured into a drum, with or without a lid. You even see traces of oil and paint around drains.

"Personal hygiene is often lacking. There might be just a single shower for fifteen employees who all finish work at the same time. Sometimes, the shower is used for storage.

"Many occupational inspectors would need further education in chemistry in order to control chemical handling."



BAD HABITS!



BREATHING PROTECTION:

Faulty, wrong type, or entirely missing.

EYE PROTECTION:

Failure to wear goggles when handling corrosive substances.

VENTILATION:

Inadequate general ventilation and absence of point exhaust where needed.

HAZARDOUS CHEMICALS:

Old products are "weeded out" from time to time, but new ones are bought at the same or even a greater rate.

EMERGENCY PROCEDURES:

Nobody knows exactly what to do in case of accidents, poisoning, fire, ex-

REFUSE TREATMENT:

Careless treatment and handling of refuse, waste and surplus chemicals. Sometimes, spills are even disposed together with ordinary garbage.

EPOXIES AND ISOCYANATES:

People who handle these highly dangerous substances don't bother to learn about them, or aren't given adequate information.

RESPIRATOR STORAGE:

Carbon filter masks are stored in workrooms — a filter with several weeks' capacity could expire within days.

RESPIRATOR MAINTENANCE:

Masks are dirty and greasy. Membranes stick, valves leak.

RESPIRATOR USE:

Masks are worn only sometimes or not at all. Bearded mask users are unaware of severe loss of protection factor.

THE PERFECT WORKSHOP:

the other, brighter side of the coin

The new express section for small car repairs is a huge success in the town of Växjö, Sweden. None the least because it is probably one of the most safety conscious operations in Sweden's car refinishing business.

Eight to ten jobs are done every day. The spray booth, doubling as a drying room, opens from three sides. On one side, preparation work is done. Filler and under-coat are rapidly dried through infra-red radiation. The IR-element moves along a ceiling rail, and reaches all parts of the car. There are no cables or stands on the floor.

The vehicle is moved sideways on a track. The lacquer is also dried by infra-red rays. The IR element is computer controlled, and operates only on those parts of the car that have been relacquered. A door dries in only six minutes.

The air in the spray booth is continuously replaced every 20 seconds. Pigment particles and paint droplets are absorbed by a self-cleaning filter. No manual cleaning is necessary, and the risk of spontaneous combustion is negligible.

The energy costs are minimal, thanks to the short drying times and effective heat recycling.

The spray painters work in a glass booth, wear proper breathing protection, rubber gloves, and ear muffs with in-built radio.

Spilt paint and dirt falls through the grid floor. Walls and ceilings are sound proofed. All machinery is sound insulated.

The car sits on a swivelling platform in order to eliminate unnecessary movements. All work stations are equipped with hydraulic lift tables: there are no uncomfortable positions, no heavy lifts.

Polishing machines are hung from the ceiling, with incorporated compressed air and dust suction hoses. Hazardous lead particles are effectively sucked up to a large container. Moreover, the machines are fitted with vibration reduction devices.

Each work station in the paint mixing area is fitted with point exhaust screens, effectively sucking out any solvent before it reaches head height. Paint samples are dried in a couple of minutes in infra-red light. Tins are compressed and disposed into a special waste bin. Thinners are collected, distilled and re-used. Acetone and thinners are stored outside the building.

In-house training and further education is available. For instance, colour mixing to the exact nuance, which is an expert craft, indeed.

During meal breaks, employees have direct access from the coffee room to a small garden with luxuriant lawns, plum trees and flowering shrubs.

SO WHAT'S THE BOTTOM LINE?

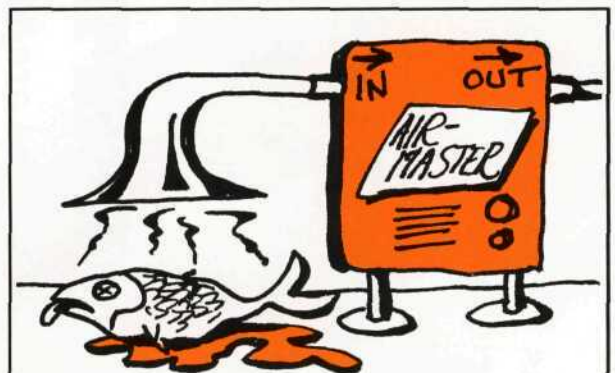
The company has made a name for itself not only in the field of car refinishing, but also in industrial safety. Since 1978, some 42,000 visitors from 43 countries have come to see for themselves what really can be achieved.

However, the REAL bottom line is this:

Ten years of annual medical check-ups has found one single case of allergy: no more, no less.



Source: Nina Alm, "Vi vill vara kunskapsbank", Arbetsmiljö 12/88, pp 24-25.



SUPPLIED AIR, SURE...BUT IS IT FRESH?

Pay attention to the position of your compressor intake: if wrongly placed, you could be breathing exhaust from engines, cigarette smoke, or even air contaminated by chemical fumes. Make sure that the compressor uses fresh, unpolluted air.

QUESTIONS & ANSWERS:

MUSIC TO MY EARS

"I've been using a walkman headset in the machine room for a long time to drown the noise of the machines. Now the safety officer tells me I shouldn't use it. The machines aren't very noisy, I'm not performing any dangerous duties, and I tuck the cable under my overalls. Why can't I use the radio?"

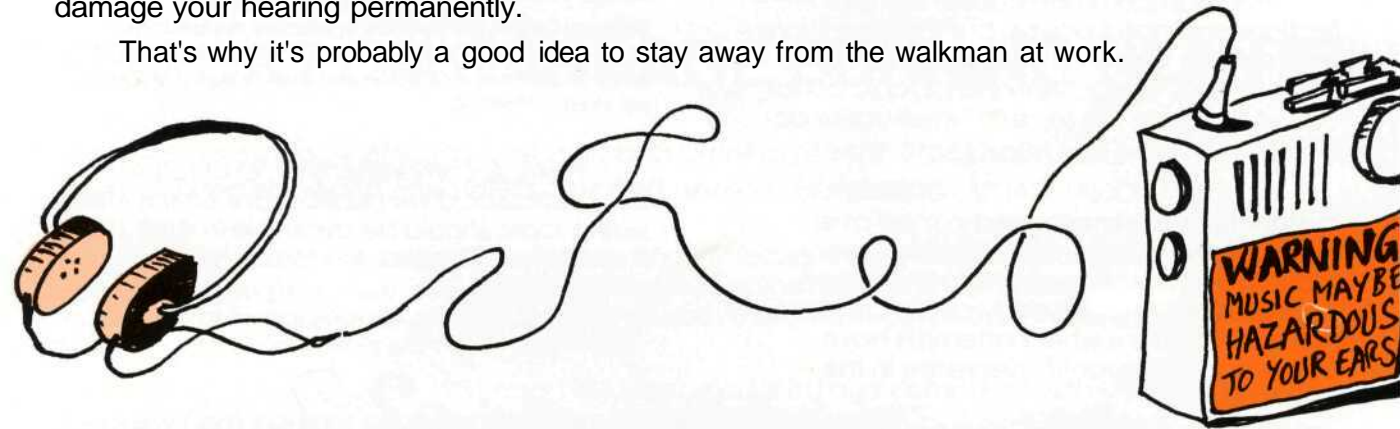
Your safety officer's concern has probably not so much to do with the wires as with noise exposure.

Music radio headsets are not designed like proper ear muffs: the surrounding noise is not dampened. The result is that you turn up the music volume instead, only adding to the noise exposure.

In fact, "drowning" moderate level machine noise with music could very well take you from an acceptable noise level to a damaging one.

Remember also that noise has an accumulative effect on your hearing: it is the total sum of all noise you hear in a day or a week, not the loudness of a single sound, that is most likely to damage your hearing permanently.

That's why it's probably a good idea to stay away from the walkman at work.



DO YOU HAVE A QUESTION?

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

**PPM Magazine
Private Bag 1001
Mona Vale NSW 2103**

My question is:

Name: _____

Address: _____

Postcode: _____

You may publish my name

Please use the following *nom de plume*: _____

OCCUPATIONAL CAUSES OF DETERIORATING SENSE OF SMELL

The sense of smell is an extremely complex realm, and there are several things that can happen to it:

ANOSMIA means loss of sense of smell. You simply cannot smell a thing - even a rotten egg or a cheese that walks by itself.

HYPOSMIA means reduced sense of smell.

PAROSMIA means a perverted or altered sense of smell. This condition usually means that most smells, even pleasant fragrances, are perceived as disagreeable or repulsive.

The most common causes are viral infections and nasal polyps, but the conditions may also be triggered by trauma, tumours, neurological, endocrinal and psychic conditions. Moreover, the sense of smell varies according to age.

OCCUPATIONAL CAUSES of olfactory dysfunctions are mentioned in most overviews. However, scientific literature is very scarce, and usually pertains to single incidents or case histories and various cross-section examinations where attempts have been made to quantify decrease in the sense of smell.

Hyposmia and anosmia have been attributed to the following substances:

- Sulphuric acid**
- Hydrogen selenide**
- Phosphoroxchloride**
- Benzene**
- Butyl acetate**
- Carbon disulphide**
- Ethyl acetate**
- Formaldehyde**
- Hydrazine**
- Menthol**
- Solvents used in paints**
- Peppermint oil**
- Trichloroethylene**
- Chalk**
- Potash**
- Iron Carboxyd**
- Tetrahydrofurane**
- Cyclohexanone**

WARNING FUNCTION

Workers using respiratory protection equipment often rely on their sense of smell to determine when a filter needs replacement: it's time to change filters when you can smell the chemical although you're wearing a mask.

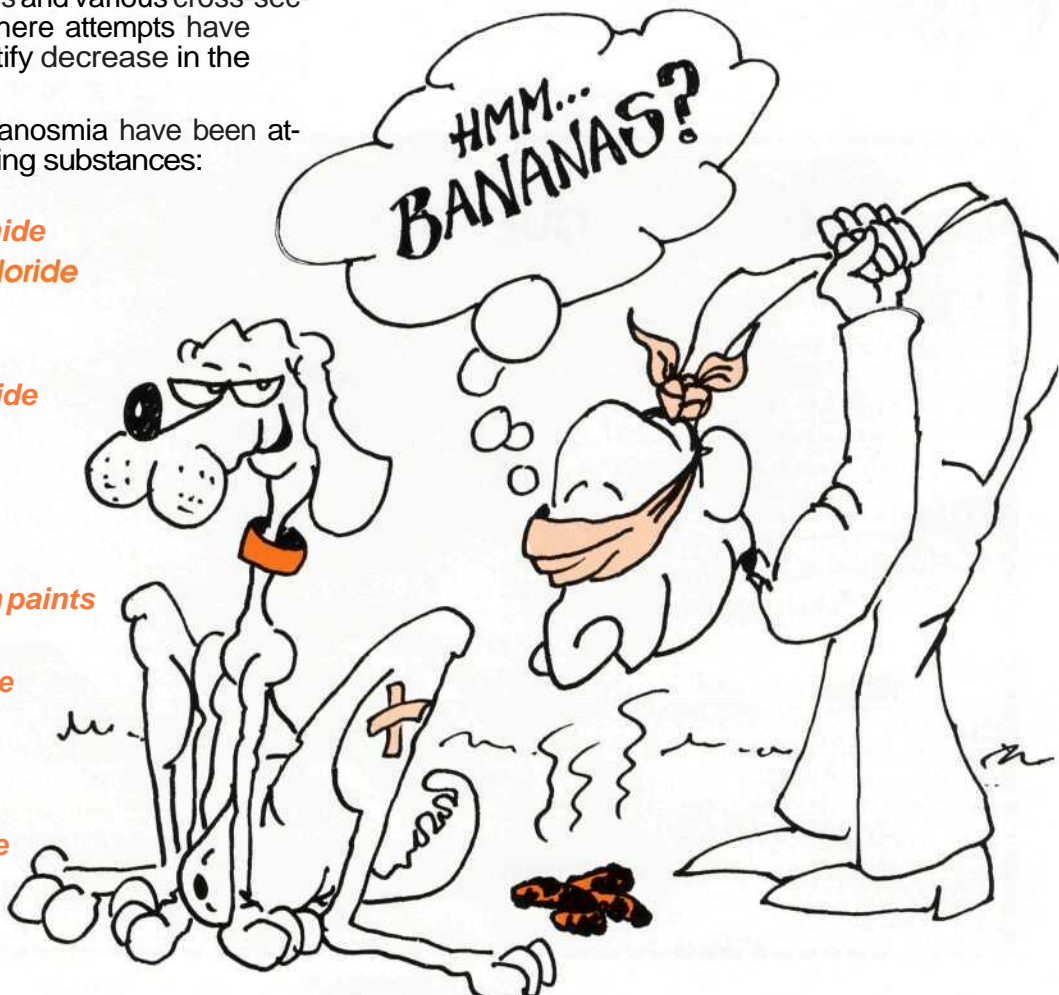
However, there are a few points to remember:

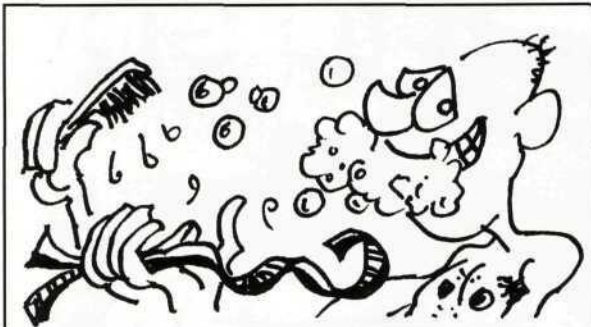
- **The TLV of the chemical may be lower than the smell level, especially if you have the flu or a bout of cold.**
- **Your sense of smell may be dulled by the chemical.**
- **Your nose may have become "used" to the smell and not notice it.**
- **In short: don't trust your nose - exchange filters according to a set time schedule.**



Sources: Doty R. L.: "A review of olfactory dysfunctions in manufacture", American Journal of Otolaryngology, 1979/1 pp 57-74; Koling A.: "Olfaction and smell in humans", Draco pro Medica 1986/5-6.

Note: A comprehensive list of references and associated publications on this interesting topic should be available in April 1989. If interested, please write to us.





THE RAP ON YOUR STRAP

Respirator straps can become a nuisance if you don't keep them clean: itchy temples? rashes on the cheeks? The reason may be dirt and grit in the fabric of the neck straps. Most straps can be cleaned with warm water and a toothbrush.

VOLUMES? NUMBERS? ISSUES? ISSN? - WHAT DOES IT ALL MEAN?

Several subscribers have enquired about our new system of numbering each issue of ppm. It's really quite simple.

The reason for change is partly due to the need to keep track of an increasing number of subscribers, and partly to prepare for possible future expansions of the magazine.

Below, you'll see the meaning of the masthead marking:

START (1986) TOTAL NO. OF ISSUES SINCE STARTED
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ISSN means "International Standard Serial Number", and means that ppm is registered with the Australian National Library, and that one copy of each issue will be kept in the Canberra archives. This number is often required by our readers in order to write subscription orders.

REPORT ON GARBAGE BURNING PLANTS

A survey on mortality of workers at a rubbish burning plant in Stockholm has been performed by two Swedish health specialists, Per and Annika Gustavsson.

Through personnel records, the names of all employees who had worked at the plant for more than one year since 1920 could be established. The records stretched to 1986, when the operation of this particular plant was discontinued. There were 176 people in the group. Smoking habits could be determined for 87% of these.

The mortality between 1951 and 1985 was calculated and compared with the expected mortality from statistics of all deaths in the Stockholm area.

Mortality due to ischaemic heart disease (coronary thrombosis - heart infarct) was increased in the waste incineration workers.

The probable cause of the increased risk is exposure to combustion products, especially polyaromatic hydrocarbons. However, exposure to other substances and asbestos could also have contributed. The workers' smoking habits did not deviate from general urban smoking habits and could not explain the increased risk.

The study should not be directly applied to other waste incineration plants, as this particular operation was old, and the working conditions in the plant were worse than in many new disposal stations.

Exposure time:	1-19 years		>19 years		Total	
	Exp.	Real	Exp.	Real	Exp.	Real
TOTAL:	9.1	8	50.7	53	86.1	85
Cancer total:	2.3	2	12.0	11	20.5	22
Lung Cancer:	0.5	1	2.6	5	4.6	9
Ischaemic heart disease:	3.1	4	17.0	25	27.0	34

Please note: a 30 year latency period was required for 1-19 years exposure and >19 years exposure; no latency period was required for the "TOTAL" figures.

Source: "Dödsorsaker bland arbetare vid en kommunal sopförbränningsanläggning" ("Causes of death among workers at a municipal waste incineration plant"), Per Gustavsson and Annika Gustavsson, Arbete & Hälsa 18/1988.

THE STUBBLE'S GOT TO GO!

A new American overview presents fourteen studies on the effects of facial hair growth - beard, sideburns, moustache - on the proper fit of breathing masks.

Two types of masks were included in the tests, negative pressure (half masks and full face masks) and positive pressure masks (supplied air masks and oxygen masks). The leakage of contaminants was measured on clean shaven people as opposed to people with various fashions and extents of facial beard growth.

Beard growth increases the leakage by 20-1,000 times. The longer the growth, the greater the leakage. Half masks showed 2-5 times greater leakage than full face masks. Certain mask types were less capable of coping with beard growth, allowing up to 10 times greater leakage than the most tight-fitting masks. Full face masks with positive pressure provided better protection than negative pressure masks.

Bearded mask users did not score high in the comparison. In fact, the authors of the paper wanted to prohibit beards when there was a risk of exposure to hazardous air pollutants. Beard could possibly be permitted when using a full face mask with positive pressure. However, to be rather safe than sorry, it was recommended that beards be prohibited even in these circumstances.



Source: American Journal of Industrial Hygienists Association, 1988/49, pp. 199-204



A SEA OF QUESTIONS may flood into our mailbag unless we explain what the new logotype below means:

SEA (Safety Equipment Australia) is a new group of manufacturers/suppliers of safety products in Australia. Sundstrom Safety, the previous publisher of ppm, is one of the members of the group, together with Peltor Australia (hearing protection), Interspiro Australia (self-contained and high performance breathing apparatus), and certain other operations.

ppm, however, is managed, written, researched and produced by exactly the same personnel as before, and no changes will be made to the format or policies of the magazine. In fact, the only changes to ppm are the logo below and the "Published by" line on the mast head of the magazine.

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