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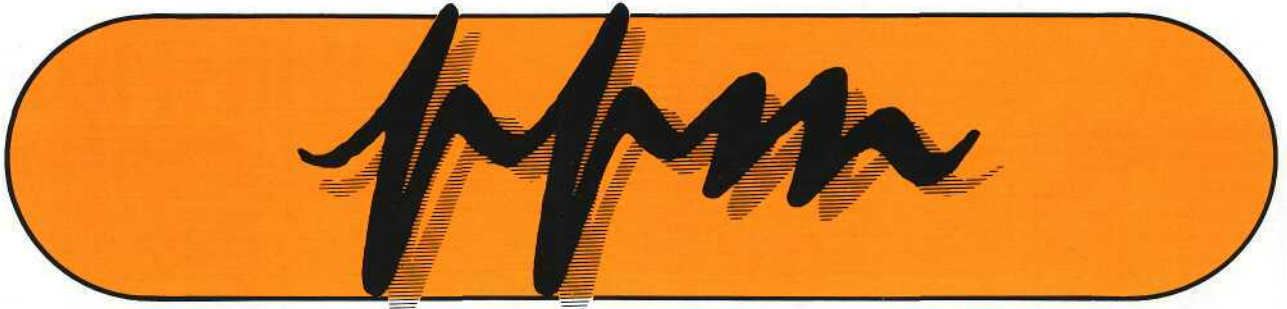
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SOLVENTS CAUSE ZZZZNORING

Sleep apnoea is a condition where the sleeping person stops breathing - sometimes for several minutes. The person wakes up to some extent, then falls asleep again. The normal sleeping pattern is severely disturbed.

It is unclear whether the oxygen deficiency created by these periods without breathing can produce any damages.

Normally, sleep apnoea occurs in about one per cent of the population. However, in people with established solvent-related conditions, apnoea is much more common - over 40 per cent.

The head physician at Avesta hospital in Sweden, Jan Ulfberg, says that anyone who feels extremely sleepy and who snores should seek help, regardless whether he or she is exposed to solvents at work,

A special mask that creates a positive pressure in the mouth or a small operation can drastically improve the condition. The snoring and breathing pauses stop, the person's sleep is uninterrupted, and the feeling of tiredness during the day disappears.

People who feel chronically tired, snore at night, and also handle solvents at work should seek medical advice.

It is still unclear whether the excessive fatigue and memory aberrations are caused by the solvents, by the sleep apnoea, or by a combination of both.



Source: Jan Enqvist, Arbetsmiljö 6/91 p21



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Joiede Vivre in the Chunnel



Le French view on safety

A film cameraman working for French TV, Sten Rosenlund, gives a graphic example of differences in safety thinking between French and British companies.

Mr Rosenlund was invited to travel on the world's first train under the English Channel.

In the middle of the channel tunnel, or "Chunnel", the contingent had to change trains, because of the incompatible rail gauges used by the two countries. But the differences didn't stop here: there was an obvious change in attitudes toward safety,

The French allowed passengers to drink champagne and smoke cigars on their section of the journey. The British prohibited all such activities, due to the great explosion risk.

At the same time, French authorities have recently announced that occupational accidents have increased in that country. The 1989 figures show a near 7 per cent increase since 1988. Fatal accidents had increased by 5.5 per cent.

While the figures went down from 1975 to 1987, this break in the trend was a great concern to the employment minister, Soisson. It is believed that the reason for the sudden turn was a lack of safety education and increased demands on work capacity.

The total number of occupational accidents in 1988 was 690,541. Fatal incidents numbered 1,153.



Source: Arbetarskydd 4/91 p3 and 5/91 p3

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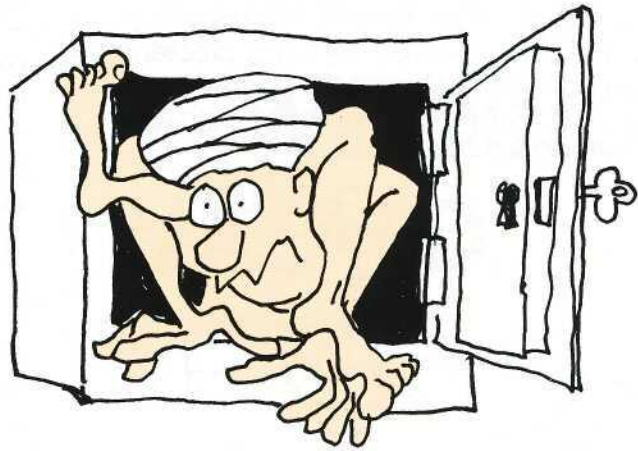
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Handy Hints



Save your eyes: the lights are there to SHINE! Switch'em on!

RUNNING OUT OF ROOM, RUNNING OUT OF AIR



The hazards of work in confined spaces

Scenario: a worker is working alone inside an empty tanker truck. He's using a chlorine detergent to clean the 15m tank. He soon inhales enough fumes to make him dizzy and disoriented. There's no time to get out, no way he could alert his work mates to his predicament. He passes out at the bottom of the tank, enveloped in chlorine fumes. His colleagues find him several hours later, too late.

What is confined space?

The American occupational health institute, NIOSH, defines confined space as a work area with one or all of the following characteristics:

- Limited openings for entry and exit
- Unfavourable natural ventilation
- A design not intended for continuous worker occupancy

Here are just a few examples of common confined spaces:

- Boilers
- Access holes
- Pipelines
- Process vessels
- Sewers

Silos

Storage tanks

Workers may be required to perform a variety of duties inside the confined space, such as rust and seal inspection, cleaning of the inside, maintenance, repairs and others.

There are a few separate hazards to look out for:

Oxygen deficiency

Normal air contains about 21 per cent oxygen. This oxygen content only has to drop by a couple of percentage points before the air no longer supplies enough oxygen to the lungs. NIOSH says that air is oxygen deficient if it contains less than 19.5% oxygen.

The confined space can become oxygen deficient for a number of reasons. For example, the air may be displaced by a heavy gas or smoke (for instance the exhaust from a diesel compressor), it can be absorbed in a chemical reaction, or it can be burnt up in welding processes etc.

Oxygen deficiency leads to asphyxiation, the most common cause of death in confined spaces,

Flammable atmospheres

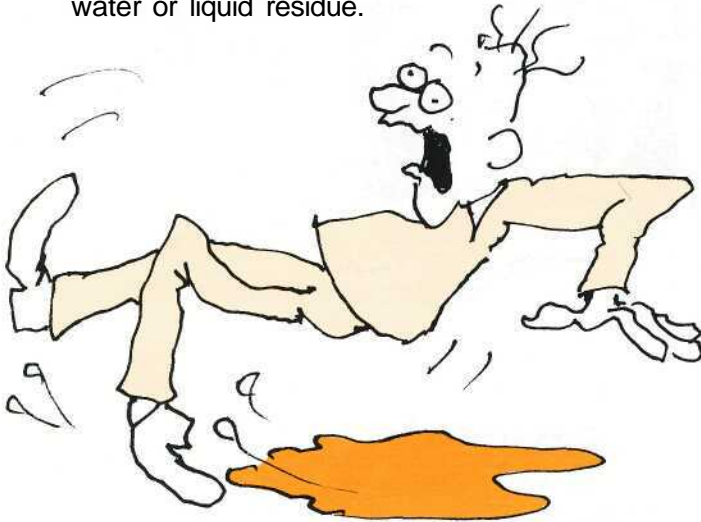
In the still air of the confined space, the concentration of flammable compounds can rapidly build up to combustion and explosion point.

Toxic atmospheres

As in our introductory scenario, fatal concentrations of toxic materials can be created extremely quickly,

Other hazards

Poor lighting often adds to the risk of falls, slips and mistakes. Noise may be a problem when it is amplified between the narrow walls. The bottom of tanks may be slippery with rain water or liquid residue.



An article in the American publication *Occupational Hazards* quotes the president of the training and consulting firm FIRECON, Mr Craig Schroll:

"Most of the things that kill people in confined spaces cannot be detected with the human senses until it is too late. You don't have the readily apparent hazard, such as the flames, heat, and smoke that accompany a fire."

Mr Schroll makes a poignant statement about would-be rescuers who, incredibly, make up 50% of all confined space fatalities:

"For some reason it doesn't click in the rescuer's mind that whatever put the first guy down is going to do the same thing to him, People think they can dash in and dash out."

How dangerous is it?

Most work procedures in confined spaces are conducted with the appropriate know-how and safety measures, and involve little risk to the worker and very few incidents. However, when an accident happens, it is usually a serious one.

One way to estimate the relative risk of a work procedure is to compare the ratio between injuries and deaths while performing the particular job. It has been estimated that there is a 10 to 1 ratio of serious injuries to fatalities in confined space accidents. The ratio for all other workplace accidents was 1,400 injuries to every death, according to the article.

SYMPTOMS OF OXYGEN DEFICIENCY

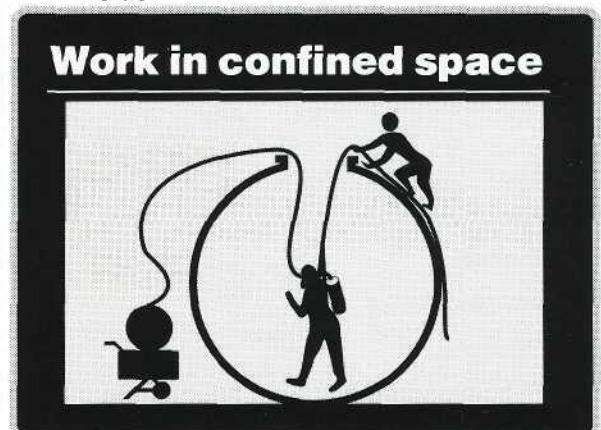
Oxygen volume at sea level (%)

Oxygen volume at sea level (%)	Symptoms
21—18	No noticeable effect
18—14	Increased breathing volume; accelerated heartbeat; impaired attention and thinking; impaired coordination
14—10	Very faulty judgment; very poor muscular coordination; muscular exertion causes rapid fatigue and may cause permanent heart damage; intermittent respiration
10—6	Nausea; vomiting; inability to perform vigorous movement or loss of all movement; unconsciousness followed by death
<6	Spasmodic breathing; convulsive movements; death in minutes

How to play it safe

When working in a confined space, the ideal set-up should look something like this:

- A positive pressure compressed air device should be used.
- A self-contained back-up system must be carried on the person. Ideally, this back-up system will engage automatically in case the external air supply is accidentally disconnected.
- A rescue harness should be fitted.
- The harness should be controlled by an associate outside the confined space, who is in constant contact with the worker inside.



While outside assistance is of utmost importance, many people feel that the selection of such assistance personnel is often forgotten. Mr Michael Roop of the American Roco Corporation, says attendants need extensive training.

"The attendant has an awesome responsibility. Unfortunately, in many work places, it's not unusual for the least skilled person to be picked to serve as an attendant because the perception is he's just standing there with nothing to do."

Mr Roop points out that the attendant is responsible for knowing what's going on inside the space without being in there, and for ensuring that external hazards don't affect the air supply (such as motor vehicles near the compressor intake etc). The assistant also has to be in constant contact with the person inside and with the foreman, and must be competent enough to decide when a job should be stopped, or when help is needed. Naturally, the assistant must be trained in all of these fields, apart from the actual rescue procedures.

Entrants should also be trained properly, says Mr Roop. They need to know a number of things, including how to recognise hazards; how to maintain communication with the assistant; how to use personal protection equipment; and how to initiate self-rescue.

Ideally, training should be performed on-site and operating as a team.

"Rescue (...) requires practice time and the ability to make decisions", says Michael Roop. "Rescue is the kind of thing that if you can't do it real well or real fast, you may as well not do it at all. It becomes a body recovery."



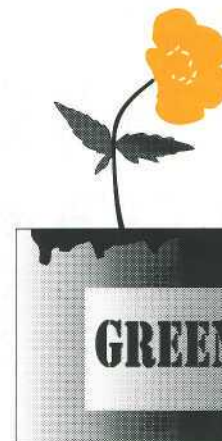
Source: Gregg LaBar, Occupational Hazards, Penton Publishing, Cleveland, Ohio, Feb 1991; Australian Standard AS 1715-1991, Standards Australia 1991



GREEN PAINT — WELDING HAZARD

Chloropolymer products may be considered an environmentally sound alternative to epoxy and polyurethane paints, but may cause severe problems to welders.

Bengt Sjogren from the occupational medicine unit at the Swedish Work Environment Institute has surveyed patients who had been in contact with chloropolymer lacquers. When heated, the molecular structure is broken up, and various materials are released, including chlorinated substances.



Welders working on steel that has been painted with chloropolymer products may experience high fever and breathing difficulties.

One example presented by Mr Sjogren was a 47 year old inspector whose work duties involved about 1/2 hour's welding per day. Five or six hours after welding steel coated with a chloropolymer paint, the worker displayed tremors and impaired breathing. He later suffered several such attacks.

Mr Sjogren urged that welders should be made aware of the risks.

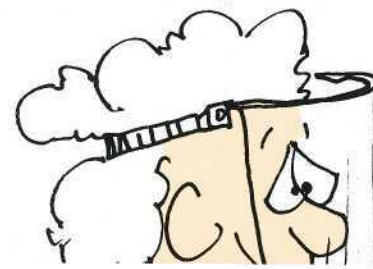


Source: Arbetsmiljö 5/91 p8

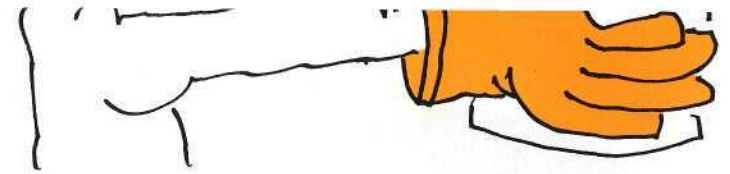
SAVE YOUR SKIN!

A few simple precautions for manual chemical handling

- Read the **label** before opening a container
- Wear personal protection as directed
- Always use gloves and face shield when handling undiluted chemicals - even if the label **doesn't** state this
- If there is any air movement, make sure you stand upwind
- Make sure you have perfect control of pouring
- **Don't** create foam or lather when pouring



- Don't blow or suck clean nozzles or filters. Replace with a spare one.
- Have soap and water at the ready.
- Wash before smoking, eating, drinking and going to the toilet.
- Wash before rubbing your eyes.
- Change soiled clothing immediately.
- If using disposable clothing, mark waste bags properly.
- Store chemicals behind lock and key.
- Never enter a confined space (car, operator booth etc) wearing soiled clothing.



LEAD DAMAGE BELOW EXPOSURE STANDARDS



Hazard to the unborn child

*An article in the Swedish work safety magazine *Arbetsmiljö* outlines the effects of lead in concentrations well below the levels set by occupational health authorities. (Sweden: 0.1 mg/m³ — Australia: 0.15 mg/m³). We publish a translation of the article in its entirety.*

"Lead can damage the nervous system and kidneys at levels well below the current exposure standards. It can also cause nerve damage in the foetus.

"It ought to be self-evident that women should not work with lead at all", claims *Marie Vahter*, professor of the Institute of Environmental Medicine.

In a new proposal for a new exposure limit for inorganic lead, professor *Staffan Skerfving* of the occupational health clinic in Lund concludes that light effects on the nervous system and kidneys may occur at 0.03 mg/m³.

Nerve damage in the foetus can occur if a pregnant woman is exposed to a lead concentration of 0.02 mg/m³ (five times below the current Swedish value; 7.5 times lower than the Australian exposure limit).

"There is a very great risk of damage to children", says Marie Vahter, "Their performance is lower, and their mental development is delayed."

Today's (Swedish) exposure limit is 0.1 mg for each m³ of air (Australia's limit is 50% higher at 0.15 mg/m³).

"It's too early yet to tell whether we will lower the limit", says *Arne Stråby*, section manager at the Swedish Worksafe Directorate.

Marie Vahter replies: "We are striving to lower the exposure to lead in the general environment, with a special concern for children. Therefore, it is strange that another authority permits enormously higher levels in the working environment."

Discrimination?

The lead regulation dates from 1984. Then, the Swedish Worksafe Directorate was criticised by researchers that it did not prohibit women from working in the lead industry. Now, the same limits are set for both men and women. However, pregnant women will be relocated by the employer. The Worksafe Directorate considered the separation of men and women to be discriminatory.

"I would like to meet someone who wants equality at the expense of the baby's health", says Marie Vahter, "It doesn't help to relocate the women. Once pregnancy has been established, a couple of months have passed, and that's too long. The level of lead in the blood decreases only slowly."

The Swedish Worksafe Directorate will discuss the new scientific proposal for a new exposure limit in March 1992. The Swedish Metal Workers' Union has demanded a reduction. The union, together with employers, has put together its own document on lead. It contains education and information on risks and risk prevention,

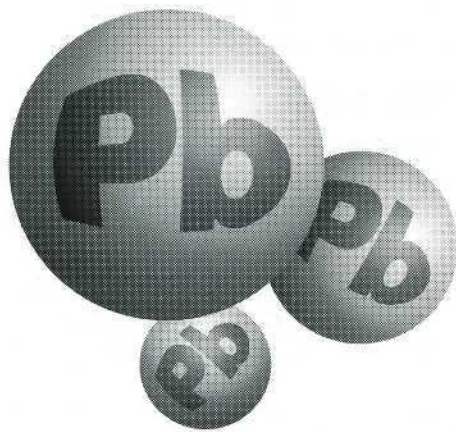
Why haven't you done so earlier?

"Good question. The Worksafe Directorate already has a regulation on lead. The com-

panies are required to inform workers about the regulations, but it doesn't work", says *Rolf Ahlberg*, occupational health representative with the Swedish Metal Workers' Union.

Lead has long been a health problem. Now, interest has been renewed because the substance has shown effects at low concentrations, including effects on the central nervous system in babies. A Danish report shows that the sperm quality in men deteriorates at lead levels in the blood that are lower than the Swedish exposure limit,

In the United States, scientists are talking about lead as a great working environment



problem of the 90s, Overexposure of workers to lead has been named a national scandal. In the USA, the big problem is lead-based paint that results in high exposure.

According to the Institute of Work Environment, inorganic lead causes cancer in animals, but there is no evidence that it does so in humans. Lead can cause other symptoms, such as anaemia and gastro-intestinal complaints. It can also result in severe blood poisoning, leading to damage to the central nervous system,

Varying effects

The effects vary between different people; some may have very high levels of lead in the blood without damage, whereas others are affected by lower levels. We are exposed to lead at our leisure time, from water, tobacco and food. The levels are low for Swedes, and the exposure to adult Swedes has decreased over the last decade.

Less is known about the case of children, In small children, the lead can penetrate the

blood-brain barrier easier, and reach the nervous system.

Lead exposure occurs extensively in smelters, foundries and battery factories.

At the Varta battery factory in Hultsfred, Sweden, one out of five of the company's 530 employees had a lead level above the exposure limit in their blood when a survey was conducted prior to Christmas 1990. At the same time, the air concentration of lead exceeded the limit in several places.

The situation was better in later surveys, with 20 workers showing blood levels above the limit value.

Still, the company has decided to relocate people earlier than required by the Work-safe Directorate.

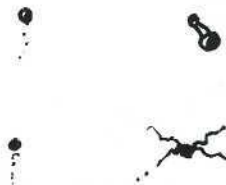
"Relocation is not enough", says *Anne-Marie Stomrud*, chemist at the Swedish work inspection authority in Kalmar. "The company must come up with technical solutions in order to bring down the air concentration of lead."

"We are putting in new plant that, we hope, will bring the exposure down below the exposure limit", says the company's head safety representative *Ulf Nilsson*. "In some places, robots will be introduced."



Source: Hans Lundgren; Arbetsmiljö 4/91, p23

Handy Hints



Don't let missing or damaged safety fittings just sit there: REPORT THEM!

FARMER'S LUNG

Not only farmers affected

You don't have to be a farmer to suffer from farmer's lung. In fact, the disease has a much wider spread than the agricultural field.

Mould bacteria have endotoxins in their cellular walls. Recent research shows that inhaled endotoxin is severely irritating to the respiratory tract, and are capable of causing inflammation in the bronchi and alveoli. The symptoms are similar to acute alveolitis. These bacteria occur in moist environments. Scientists believe that endotoxins cause byssinosis (cotton wool fever), air conditioner fever (in the graphic industry), and fever reactions in cleaners.

Where does mould occur?

Here is a list of common sources of mould that can cause alveolitis:

- Hay
- Cereals
- Stables
- Piggeries
- Pigeon coops
- Chicken farms
- Wood chip storage
- Turf storage
- Wood cutting (drying of newly sawn timber)
- Wherever air moisture control equipment is used
- Waste treatment plants
- At home (where storing old fire wood etc.)

What is alveolitis?

A broad definition of alveolitis is an inflammation of the alveoli and peripheral bronchi, caused by inhalation of non-infectious organic material. The inhaled material can be micro-organisms, some proteins, or endotoxin.

The immune system is involved. Earlier, scientists believed that allergic alveolitis was caused by an immune complex between antibodies in the blood and antigens in the inhaled material. Nowadays, however, other immune mechanisms are considered to be involved, such as the influence of sensitising T-lymphocytes.

Acute alveolitis is often thought to involve both allergic and toxic reactions.

Who's the real culprit?

A number of mould fungi and bacteria can cause a reaction. The micro-organisms don't have to be alive in order to trigger an attack.

A temperature tolerant fungus, *Aspergillus fumigatus* can cause aspergillosis (a disease where the spores will settle and grow in the lung).

Many other spores cannot grow in the temperature conditions in the lung.



How much before you get sick?

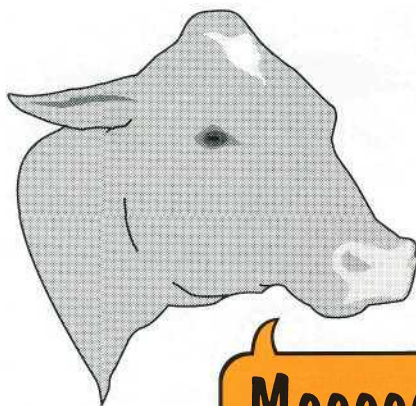
Very high exposure causes acute reactions in all people, even those who have not become sensitised to mould dust. This acute reaction may cause severe lung problems.

Repeated exposure over weeks or months may develop allergic alveolitis, meaning over-sensitivity to the dust, coughing, impaired breathing and decreased lung function.

The danger level seems to be around 10^9 micro-organisms per cubic metre, Normal farm-work involves 10^6 — 10^7 per cubic metre. However, the type of bacteria and the humidity influence the likelihood of contracting the disease even at lower levels. (Certain animal operations are an example).

What are the symptoms?

An acute attack is signified by fever and general sickness, often with pain in the joints and muscles. It looks like a bout of the 'flu.



The patient usually recovers completely after a singular attack. However, after repeated exposure, allergic alveolitis can occur, with regular fever attacks, continuing cough, sometimes with shortness of breath, and often a feeling that you can't "cope" with dust as well as you used to.

Can you continue work?

Acute alveolitis is usually benign, and the symptoms will disappear after you discontinue work. Attacks are caused by infrequent work procedures that involve high concentrations of mould. The outlook is bright, though: chances are good that information and sanitation of the workplace can minimise the problem.

Allergic alveolitis associated with changes in the lung and precipitated reactions occurs where the work environment is very poor, and after repeated exposure. The affected person probably has an increased

sensitivity to microbial dust. There is a question whether people in this group can return to their work, even if the workplace has been sanitised in a normal way.

The following steps should be taken:

- Ensure that the workplace is thoroughly sanitised of sources of mould. Farmers should consider changing the method of storing grain.
- Get proper instruction on inhalation of mould dust and mould control measures.
- Use breathing protection; a half mask with a particle filter for instance.
- Have annual check-ups to ensure that the symptoms don't return. Coughing is a warning signal.



Source: Malmberg, Rosenhall, Stalenheim, Belin, Palmgren, "Allergic Alveolitis", Swedish WorkSafe Directorate 1984, publication ADI 277

Handy Hints



Make sure you know how long your gloves will last in the chemical you're handling. It could be a matter of minutes!

NOW THAT'S A JOB WELL DONE!

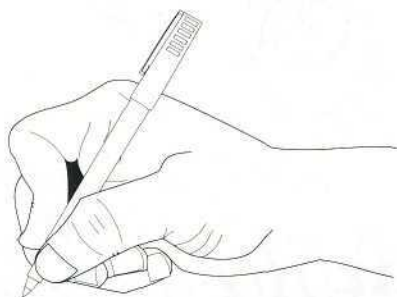
When Stena Line, the big Scandinavian passenger shipping company, performed a chemical inventory survey recently, it was found that the company used 156 different chemical products from 46 different suppliers. Most of the products were used by cleaning personnel in the company's accommodation sector.

The safety engineer went through all preparations, requesting product information from each supplier. Many suppliers refused to furnish information, and these were immediately struck from the list, as were those who were unable to give complete information on their products.

The exercise left 10 products. The remaining 146 were either unnecessary or unsafe.



Source: Per Sundström, Arbetsmiljö 5/91 p32



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**There was an old fool in Vancouver
Who took an old swab and his Hoover
Went into a tank
To clean it (it stank)
Please summon the body remover!**



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