

# Pesticides

Provisions of the Swedish National Board of Occupational Safety and Health on Pesticides together with General Recommendations on the implementation of the Provisions

## **Translation**

In the event of disagreement concerning the interpretation and content of this text, the printed Swedish version shall have priority

The Swedish Work Environment Authority was formed through a merger of the Swedish National Board of Occupational Safety and Health and the Labour Inspectorate, on 1<sup>st</sup> January 2001.

Provisions adopted by the Swedish Work Environment Authority are published in the Statute Book of the Swedish Work Environment Authority. Provisions earlier published in the Statute Book of the Swedish National Board of Occupational Safety and Health simultaneously still apply. Both Statute Books' names are abbreviated AFS.

Please note that references to statutes always give the original number of the document concerned, regardless of any subsequent amendments and reprints.

Concerning amendments to and reprints of Provisions of the Swedish National Board of Occupational Safety and Health and of the Swedish Work Environment Authority, reference is made to the latest Statute Book Register (in Swedish). A list of Ordinances, General Recommendations, Directions and Notices is also published in English.

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## Provisions of the Swedish National Board of Occupational Safety and Health on Pesticides



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The following Provisions are issued by the National Board of Occupational Safety and Health. Sections 1-10 are issued by authority of Section 18 of the Work Environment Ordinance (SFS 1977:1166), Sections 11-14 and Sections 16-19 by authority of Section 15 of the Pesticides Ordinance (SFS 1998:947), and Section 15 by authority of Section 13 of the Pesticides Ordinance.

### Scope

#### Section 1

These Provisions apply to work with such products as, under Chap. 15, Section 5 of the Environmental Code, are to be deemed chemical pesticides.

The Provisions also apply to work with products which are closely allied to pesticides and for which the National Chemicals Inspectorate, by authority of Section 2 of the Pesticides Ordinance (SFS 1998:947), has prescribed that the stipulations concerning pesticides shall apply.

These Provisions further apply to work with materials and products which have been treated with a product of the kind referred to in subsection one or two of this Section.

These Provisions do not, however, apply to work with products for which the National Chemicals Inspectorate, by authority of Chap. 14, Section 16 of the Environmental Code, has prescribed exceptions to the requirement of approval under Chap. 14, Section 13 of the said Code.

### Written handling and safety instructions

#### Section 2

Written handling and safety instructions shall exist for:

- work with pesticides which, under Section 11 of the Pesticides Ordinance, have been referred to Class 1,
- work with an antifouling product, and

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- work with another pesticide or with materials or products which are treated with a pesticide, if the work entails special risks of ill-health or accident.

## **Personal protective equipment**

### **Section 3**

If work with a pesticide or with materials or products treated with a pesticide entails a risk of skin contact with the pesticide, the person doing the work shall use protective gloves and such other personal protective equipment as is needed. Respiratory protective equipment shall be used if there is a risk of a pesticide being inhaled in harmful quantities.

## **Personal hygiene**

### **Section 4**

In connection with work using pesticides, a suitable cleaning agent and water shall be available to the extent necessary for washing away pesticides deposited on the skin.

## **Spreading of pesticides in greenhouses or on other premises**

### **Section 5**

When pesticides are being spread in a manner liable to entail inhalation of or direct contact with the pesticide in a greenhouse or on other premises, signs shall be displayed at every entrance to the premises. The signs shall indicate the fact that pesticides are being spread and the conditions for admittance to the premises.

## **Spreading of pesticides in gaseous form**

### **Section 6**

Under Provisions issued by the National Chemicals Inspectorate, certain pesticides shall be given the designation SoX when approved under Chap. 14, Sections 13 and 14 of the Environmental Code. Such pesticides may be spread in gaseous form only under conditions where immediate assistance is available in the event of an accident.

## **Industrial wood preservative treatment**

### **Section 7**

Floors of premises for industrial wood preservative treatment shall be constructed and maintained in such a way that they are easy to keep clean.

### **Section 8**

An impregnation plant shall be constructed in such a way that exposure to wood preservatives can be avoided when the cover of an impregnation cylinder is opened.

## **Antifouling products**

### **Section 9**

Spraying of antifouling products shall take place within a specially marked area. Only personnel taking part in the application work may enter this area. Signs to this effect shall be put up so as to be clearly visible. The area shall be large enough for personnel outside it to be protected against the risk of ill-health resulting from the application work.

Where necessary for the avoidance of exposure, the stipulations of the foregoing shall also be observed in connection with other work on the application of antifouling product.

### **Section 10**

Before work on the removal of antifouling product begins, the dangerous substances contained by the product shall as far as possible be identified. The protective measures needed in view of the composition of the product shall be taken. If the composition of the product cannot be made clear, measures shall be taken which afford adequate protection against any dangerous substance which can reasonably be expected to occur in the product.

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## **Special Provisions on permission to use Class 1 pesticides for the treatment of wood and concerning knowledge requirements for the use of such pesticides**

### **Section 11**

The Provisions of Sections 11-15 apply only to such pesticides for the treatment of wood as are referred, in Section 11 of the Pesticides Ordinance, to Class 1, and the use of which, under Sections 11 and 14 of the same Ordinance, is subject to permission from the National Board of Occupational Safety and Health.

### **Section 12**

Permission to use pesticides as referred to in Section 11 is granted by the National Board of Occupational Safety and Health subject to the following conditions.

1. At the workplace where the pesticide is to be used, there is at least one person who has completed a training programme, arranged by the National Board of Occupational Safety and Health, for the pesticide use concerned and who in doing so has obtained a training certificate issued by the National Board of Occupational Safety and Health. Such a training certificate may not, however, be more than five years old.
2. The National Board of Occupational Safety and Health judges that use will take place with adequate security against ill-health and accidents and against damage to the environment.

### **Section 13**

Permission is granted for a period of up to five years and can be revoked by the National Board of Occupational Safety and Health if necessary for reasons of safety. The permission may be combined with special conditions.

The permission is valid only for as long as there is normally present at the workplace a person having a training certificate, as referred to in Section 12, which is not more than five years old.

### **Section 14**

Application for permission shall be made by the employer or undertaking that is to carry on the activity.

The application shall contain the following particulars:

1. The name and address of the employer or the undertaking and of the workplace where the activity is to be conducted.



2. The name of the person or persons at the workplace holding a training certificate not more than five years old, together with a description of their duties.
3. The pesticide or type of pesticide which is to be used, together with estimated annual consumption of the same.
4. A description of working methods and equipment.
5. The approximate number of persons intended to be directly involved in the use.
6. The time for which permission is requested.

The following documents shall be appended to the application:

7. A training certificate, not more than five years old, for the person or persons referred to in point 2.
8. Handling and safety instructions drawn up for the work.
9. A statement from a safety delegate representing the employees who are to take part in the work, to the effect that such a delegate exists.

#### **Section 15**

Personnel taking part in the use of pesticides as referred to in Section 11 shall have a good knowledge of

- the properties of the pesticides used, from the viewpoint of health and the environment,
- the way in which the work is to be conducted, having regard to the risks which the pesticide entails, and
- the way in which the personal protective equipment needed for the work is to be used and cared for.

### **Special Provisions on permission to use Class 1 pesticides for antifouling treatment and concerning knowledge requirements for the use of such pesticides**

#### **Section 16**

The provisions of Sections 16-19 apply only to such pesticides for antifouling treatment as are referred, in Section 11 of the Pesticides Ordinance, to Class 1, and the use of which, under Sections 11 and 14 of the same Ordinance, is subject to permission from the National Board of Occupational Safety and Health.

#### **Section 17**

Permission to use pesticides as referred to in Section 11 is granted by the National Board of Occupational Safety and Health subject to the Board

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judging that the use will take place with adequate security against ill-health and accidents and against damage to the environment.

### **Section 18**

Permission is granted for a period of up to five years and can be revoked by the National Board of Occupational Safety and Health if necessary for reasons of safety. The permission may be combined with special conditions.

The permission applies only to work done by personnel who have completed a training programme, arranged by the National Board of Occupational Safety and Health, for the pesticide use concerned and who in doing so has obtained a training certificate issued by the National Board of Occupational Safety and Health. Such a training certificate may not, however, be more than five years old.

### **Section 19**

Application for permission shall be made by the employer or undertaking that is to carry on the activity.

The application shall contain the following particulars:

1. The name and address of the employer.
2. A description of working methods and equipment.
3. The time for which permission is requested.

The following documents shall be appended to the application:

4. Examples of handling and safety instructions drawn up for the work.
5. A statement from a safety delegate representing the employees who are to take part in the work, to the effect that such a delegate exists.

## **Penal Provisions**

### **Section 20**

Penal provisions concerning liability for infringements of the Provisions of Sections 11-19 are contained in Chap. 29 of the Environmental Code.

## **Entry into force and interim provisions**

These Provisions enter into force on 1st March 1999. The Ordinance of the National Board of Occupational Safety and Health (AFS 1988:5) containing Provisions on Pesticides is repealed with effect from the same date.

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Permission granted by the National Board of Occupational Safety and Health under Section 12 or 17 of the repealed Provisions shall apply as permission under, respectively, Sections 12 and 17 of the new Provisions.

With regard to training certificates issued before 1st January 1994, and in derogation of the provision made in Section 12 concerning validity, the certificate shall be valid for up to eight years.

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## **General Recommendations of the National Board of Occupational Safety and Health on the implementation of the Provisions on Pesticides**

The following General Recommendations are issued by the National Board of Occupational Safety and Health on the implementation of its Provisions on Pesticides.

General Recommendations have a different legal status from Provisions. They are not mandatory, their function being instead to clarify the meaning of the Provisions (e.g. by indicating suitable ways of meeting the requirements, giving examples of practical solutions and procedures) and to furnish recommendations, background information and references.

### **Background**

Basic stipulations on the handling of pesticides, among other substances, are to be found in the Board's Dangerous Substances Ordinance (AFS 1994:2). The Provisions on Pesticides contain supplementary rules on the handling of pesticides.

### **General remarks concerning pesticides**

In order for a pesticide to be imported from countries which are not members of the European Union, sold, transferred or used, they must, with certain exceptions, be approved by the National Chemicals Inspectorate. Provisions on this subject are contained in Chap. 14, Section 13 of the Environmental Code. The pesticide is approved for use only within a specified field of application. In certain cases an application method is also prescribed. It follows from Chap. 14, Section 13 of the Environmental Code that all other use is prohibited.

When a pesticide is approved, the Pesticides Ordinance requires those of its properties which are dangerous for health and the environment to be assessed with reference to the field of application. On the basis of this assessment, the pesticide is then referred to one of three classes.

The Ordinance lays down that pesticides belonging to Class 1 may only be used professionally and by a person having a special permit. The Swedish Board of Agriculture or, at its discretion, the county administrative board grants permission of this kind for the use of Class 1 pesticides in activity

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primarily relating to agriculture, forestry and horticulture. When approved, these pesticides are allotted the supplementary designation L. The National Board of Health and Welfare grants permission for the use of Class 1 pesticides against vermin and pests in buildings, facilities and structures. These pesticides are allotted the supplementary designation So or SoX. The National Board of Occupational Safety and Health grants permission for the use of pesticides referred to Class 1 as wood preservatives and in other activity. These pesticides are allotted the supplementary designation ASS.

Under the Ordinance, pesticides referred to Class 1 may be used only if certain special knowledge requirements are met. These knowledge requirements are defined by the various sanctioning authorities.

The Ordinance lays down that pesticides referred to Class 2 are for professional use only. In the case of Class 2 pesticides used mainly in agriculture, forestry and horticulture or as wood preservatives, the National Chemicals Inspectorate has prescribed that certain knowledge requirements have to be satisfied. For these pesticides, which carry the supplementary designation L, approved training is stipulated but not a permit for use.

Class 3 pesticides may be used by anybody.

Rules prohibiting the employment of minors (i.e. persons under the age of 18) on work with Class 1 and 2 pesticides and indicating certain exceptions to the prohibition are contained in the Minors at Work Provisions issued by the National Board of Occupational Safety and Health (AFS 1996:1).

### Health hazards

Pesticides are used for combating living organisms. Normally their manner of operation means that they can endanger human health. The risk of ill-health entailed by handling depends among other things on the danger of the pesticide to health, the way in which it is handled and the length of time for which a person is exposed to it. Other components than the active substance may help to make the pesticide dangerous, e.g. solvents which are included in it.

Pesticides can be absorbed by the body above all percutaneously and by inhalation. They can also be absorbed by inadvertent ingestion. Where certain pesticides are concerned, percutaneous uptake has a very important bearing on the risk of ill-health.

Pesticides coming into contact with the body or absorbed by it can cause a variety of injuries, e.g. irritations, acute poisoning, chronic injuries and

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allergies. Injuries can appear immediately, as for example with irritation to the skin and eyes or acute poisoning. They can also appear a long time after exposure to the pesticide or after many years of working with it.

### **Planning and product selection**

It is important that a risk assessment should already be undertaken when work with both pesticides and treated material is being planned, the object being to choose a working technique and equipment which will reduce the risks of exposure to the pesticide.

The choice of pesticide also has an important bearing on risk reduction. In product selection, consideration should be paid to the health hazards entailed by the constituent substances. If possible, moreover, a type of preparation shall be chosen which can be handled with the least possible risk. For example, a granulate is preferable to a powder formulation, and an emulsion in water to an agent dissolved in an organic solvent.

The Pregnant and Breast-feeding Employees Provisions issued by the National Board of Occupational Safety and Health (AFS 1994:32) contain rules requiring the employer to judge whether there are factors which are harmful to a pregnant woman or to the embryo, to breast-feeding or to the breast-fed child. If such factors exist, an individual assessment of risk is to be made for the person who has informed her employer that she is pregnant.

The design for pesticide packaging also has a bearing on the risks of exposure to the pesticide. It is important that a packaging can be opened and emptied without any spillage of pesticide. Certain pesticides today are packed in water-soluble bags which are dropped straight into the tank.

Good ventilation is essential when handling pesticides indoors.

### **Information and training**

Chap. 3 of the Work Environment Act requires the employer among other things to inform his employees of the hazards which the work may entail. The employer shall also make sure that the employees have received sufficient training and acquired sufficient knowledge for the avoidance of risks. Among other things, the employee shall comply with safety instructions given.

Special knowledge requirements apply to the use of pesticides referred to Class 1. Provisions on knowledge requirements are issued by the sanctioning

authority. Various kinds of training, e.g. for use of pesticides in agriculture, in greenhouses or as seed disinfectants, are provided for pesticides with the supplementary designation L. This means that a person meeting the knowledge requirement for, say, agricultural use of 1L pesticides cannot handle Authorisation Class 1L seed disinfectants. Similar rules apply to Authorisation Class 2L pesticides. A person meeting the knowledge requirements can, however, need supplementary training or information, depending on conditions at his or her workplace.

Information about risks and safety precautions (including the personal protective equipment needed) is to be found, for example, in the labelling on the pesticide packaging and in safety data sheets which have to be provided by the supplier. Further information about risks and safety precautions is obtainable from the supplier of the pesticide or in certain cases in the form of data sheets published by the National Chemicals Inspectorate.

The Dangerous Substances Ordinance (AFS 1994:2) issued by the National Board of Occupational Safety and Health contains rules on the duty of the employer to have a good knowledge of a dangerous substance occurring at the workplace and concerning the employer's duty of information towards the employees.

A person working with pesticide-treated material capable of endangering health is also in need of information concerning risks and protection, e.g. information as to the pesticide or type of pesticide with which the material has been treated, how long ago the treatment took place and what personal protective equipment can be used.

In addition to information about risks and protection, the employee may also need handling and safety instructions; see the Dangerous Substances Provisions (AFS 1994:2) of the National Board of Occupational Safety and Health.

## **Storage and packaging**

It is important that a storage space for pesticides should be designed in such a way that it can be kept tidy. It is also important that the space should be well-ventilated and kept clean. There should be no drain in the floor. It is an advantage if spillage disposal instructions can be posted in the space. Pesticides need to be stored separately from other products. In certain cases they may need to be kept under lock and key. Pesticides should not be stored on premises frequented by human beings. It is inappropriate for personal protective equipment to be kept in a pesticide storage space. Pesticides

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subject to the permission requirements of Sections 14-21 of the Chemicals Products and Biotechnical Organisms Ordinance (SFS 1998:941) may not, under the Provisions of the National Chemicals Inspectorate (KIFS 1987:4) on Packagings and on Storage of Products Dangerous to Health or the Environment, be accessible to unauthorised persons.

Pesticides whose approval has expired and which may no longer be used should not be stored together with permissible substances. The appropriate course is for the substances no longer permitted to be sent for destruction. The municipal health and environment protection office can advise concerning the whereabouts of disposal facilities.

It is important that packaging and containers for pesticides should be designed so as to minimise the risk of splashing and spillage during mixing and filling operations. Taking into consideration the importance of the packaging for safety is primarily the supplier's responsibility, but the buyer should also be aware that packaging design has a bearing on the choice between different products. An effort should, for example, be made to avoid packagings from which it is difficult to pour steadily, if they can be avoided without compromising efforts to choose the pesticides entailing least risk. Dosing is made easier if a jerrican is provided with a dosing scale. Water-soluble batch packs, for example, may be a good alternative when pesticides are being handled in small quantities. It is important that the packaging material should be resistant to the stresses which may be involved, e.g. external mechanical interference, humidity or extremes of temperature.

It is important to be able to open the original packaging without damaging it. The packaging should be designed in such a way that it can be re-sealed without difficulty. It is also important that the packaging should be easy to empty. There are various dosing aids which can facilitate dosing, e.g. a suction-pipe spear. Filling is made easier by an induction hopper. The emptying of packagings can be made easier by a rinsing system for jerricans and plastic bags, available as an accessory to the induction hopper.

## **Transport**

When pesticides are being carried, it is important that the driving and passenger compartment be segregated from the load space. Otherwise air containing pesticide is liable to enter the cab. It is also important that packagings and equipment should be secured so that they cannot fall over or shift.



Special rules on the transport of dangerous goods (SRVFS 1998:8) have been issued by the National Rescue Services Board.

## Recommendations for special instances

### Spraying

#### *Spraying with vehicle-borne or trailer equipment*

In all spraying it is important to use the right technique and equipment, so as not to be exposed to pesticide. For example, spraying equipment with lowdrift hazard potential is to be preferred.

To reduce the risk of the driver being exposed to pesticide when spraying from a vehicle-borne or trailer equipment, the following measures, for example, may be necessary:

- A special device for purifying supply air to the driver's cab may be needed when there is a serious risk of the driver being exposed to spray mist. This is the case, for example, when spraying upwards with a fan spray.
- A vehicle with a cab should also be used in orchards wherever possible. Use of a spray tunnel is one good way of reducing the risk of exposure.
- The risk of exposure to pesticide during spraying can be reduced by fitting the spray with a multiple nozzle body and a non-drip device. The risk can also be reduced if the spreader ramp can be mechanically controlled and collapsed from the cab.
- Control and regulating systems should be positioned and used in such a way that the sprayer can be operated from inside a closed cab. It is wholly inappropriate for pressurised lines containing pesticide to be taken through the cab.

It is an advantage for the spray tank to be designed in such a way that the evacuation outlet and evacuation valve are easily accessible and the tank can be emptied without any risk of splashing etc. on the operator. Spraying should not take place when the wind blows the spray liquid towards the driver. It is important that spraying outdoors should not take place in a high wind. Provisions on outdoor spraying and on filling, cleaning and maintenance of sprays are also contained in the provisions SNFS 1997:2 issued by the National Environmental Protection Agency together with General Recommendations 97:3.

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Filling the spray equipment with pesticide entails a serious risk of contact with the concentrated agent. By fitting the spray with a suction-pipe or an induction hopper at a height where the operator can replenish the supply of pesticide standing on the ground, the filling operation can be made safer.

The filling of vehicle-borne or trailer spraying equipment without a induction hopper is made easier by good access routes, toe holds included, on the spraying equipment. The filler hole of the tank should be positioned and designed in such a way that filling will proceed without difficulty.

Spreader nozzles should not continue dripping after use. A non-drip device can be fitted to prevent this. Spreader nozzles and non-drip device should be easy to replace.

It is important that pumps, hoses and other pressurised parts should be able to withstand the load they are subjected to and should be positioned as far as possible out of harm's way. Easy maintenance is another important consideration. Rules concerning safety valves are contained in the Pressure Vessels and Other Pressure-Retaining Devices Provisions of the National Board of Occupational Safety and Health (AFS 1986:9, reprinted 1994:39).

It is important that pressure elimination and cleaning should take place before maintenance work or servicing work is started on a spray ramp, pump, spreader or other pressurised parts. Normally cleaning is also necessary before maintenance work begins on other parts of the spray.

The condition of the different parts of the spraying equipment, such as the pump, the hoses, connections, valves, filler hole, drain valve and spreader nozzles, should be checked at frequent intervals.

### *Stripe spraying*

Stripe spraying confines treatment to the rows of plants and in this way can help to reduce the amount of pesticide used. This in turn means better environment protection and less risk of the operator being exposed to pesticide, the reason being that the spray unit of the stripe spray is often covered over and drift potential in this way reduced.

### *Hand held sprayers, backpack sprayers and barrow sprayers*

Hand held sprayers, backpack sprayers and barrow sprayers are used in various connections where, for example, use of a tractor-based sprayer is not

feasible. These equipments make it possible to treat individual plants or small areas. The fact of the equipment being used in small areas and for short periods of time can perhaps mean that the user is not fully alive to the serious risks of exposure which the use of hand held sprayers, backpack sprayers and barrow sprayers entails. The user of a backpack spray, for example, carries the pesticide very close to his body and walks close to the spray mist and the vegetation which is being treated. It is very important that these sprays should be used with great care. It is important to plan the scheme of movement for the treatment, so as to avoid, as far as possible, exposing oneself to sprayer mist or newly sprayed vegetation. Care should be taken not to overfill the sprayer, so as to leave some margin for splashing. Care should also be taken not to overdose and not to have too high a pressure. It is important that hand held and backpack sprayers containers should not be pressurised when work is being done to the equipment, and that a check should be made for leaks from carry-throughs and couplings. It is important that harness and straps should be of a material which will not absorb pesticide. A host of improvements have been made to the backpack sprayer in some, but not all, more recent equipment. There may be cause to consider replacing one's old equipment with something more modern. It is important that sufficiently comprehensive personal protective equipment shall be used together with hand held sprayers, backpack sprayers and barrow sprayers.

#### *Cleaning of spray equipment*

It is important that spray equipment and vehicles should be cleaned regularly, especially if they are also used for purposes other than pest control. After pesticide has been sprayed, they should be flushed externally to remove any pesticide residues. The spreader nozzle should also be cleaned after every occasion of use. More thorough cleaning should be carried out at least once every spreading season or if necessary at closer intervals. Personal protective equipment may be needed when cleaning spray equipment. Both for ecological reasons and for the sake of the working environment, it may be appropriate for spray equipment to be filled and cleaned on a so-called bio-bed.

It is important that spray equipment or vehicles should be cleaned before being sent for repair. See also the Dangerous Substances Provisions (AFS 1994:2) issued by the National Board of Occupational Safety and Health.

It is important that filters etc. in an air conditioning installation or a similar installation for cleaning the supply air in vehicles should be cleaned regularly and replaced when necessary. Suppliers of agricultural machinery can also be contacted for advice concerning filters.

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When working in the fields, it can be hard to clean parts of the spray equipment without being exposed to pesticide. If the necessary parts are taken along, clogged spreader nozzles, for example, can be replaced. In this way on-the-spot cleaning can be dispensed with and the equipment instead cleaned under safer conditions. It is important that the sprayer should be fitted with a tank containing pure water, partly for personal hygiene and also for cleaning the sprayer or parts of the spray equipment.

## **Spreading of pesticides in greenhouses or on other indoor premises**

The use of chemical pesticides in greenhouse cultivation can be significantly reduced by careful regulation of temperature, air humidity and lighting and by using biological pesticides. In cases where chemical pesticides are nevertheless used, it is important that the particular risks entailed by the spreading of pesticides indoors should be taken into account when planning the spreading of pesticides in greenhouses and on other indoor premises. It can often be appropriate for the spreading operation to be scheduled when personnel will not need to frequent the premises for a while. When pesticides are applied indoors, atmospheric concentrations quickly reach high levels, making the use of personal protective equipment essential. Care should be taken to ensure that passages and suchlike are unobstructed, so that work can proceed safely.

It is important that employees not taking part in the spreading of pesticide should be informed of the kind of pesticide in use, and of the risks entailed by entering the space where spreading is in progress or has recently been concluded. It is also important that they should be told how to protect themselves against the risks of exposure to any pesticide residues after spreading has been concluded. Concerning access to premises where pesticides have been spread, reference is made to the Guidance on Section 5.

When pesticides are spread indoors by spraying or misting, pesticide residues may remain deposited on plants, on tables, door handles etc after application. The length of time for which pesticides remain on such surfaces varies a great deal from one pesticide to another. It is very hard to make general recommendations concerning the length of time after application for which protective gloves and other personal protective equipment should be used, and so steps should be taken to ascertain the degradation rate of the pesticide in question, not only in the atmosphere but also on the plants, and to decide, in the light of this information, what personal protective equipment

is needed. One way of finding out how much pesticide remains on the plants is by arranging for measurements to be taken of residual concentrations.

Work in plant cultures recently treated with pesticide should therefore proceed with caution. Use of protective gloves and a protective apron may be necessary. Sometimes other personal protective equipment may also be called for.

Solitary work should be planned so as to include routines of contact between employees and supervisor personnel or between employees themselves, so that people will be able to get in touch with one another within a reasonable length of time and go to the assistance of a casualty in the event of an accident. See also the Board's Solitary Work Ordinance (AFS 1982:3).

## **Disinfection and handling of disinfected seed**

Disinfection and the bagging of disinfected seed in a bagging machine should take place in a closed system. If there is a risk of exposure to seed disinfectant while disinfected seed is being transferred between disinfection machine and hopper, between hopper and bagging machine or between hopper and transport vehicle, these transfers should also be effected, as far as possible, in a closed system.

For the avoidance of direct contact with the seed disinfectant, it is important that good occupational hygiene be maintained throughout the chain of handling operations, from work with the undiluted agent to the deposition of the seed in the seedbed. Transfer of disinfected seed from bags to seed drill and the cleaning of the seed drill are instances of operations where it is important to reduce the risk of pesticide exposure due to dust formation. Use of respiratory protective equipment, protective gloves and protective clothing may be advisable, for the protection of airways and skin.

It is important that the concentration of air contaminants should be kept as low as possible during work in a space where disinfection, bagging and suchlike operations are carried on. See the Provisions on Measures Against Air Contaminants for the Prevention of Ill-health (AFS 1980:11) of the National Board of Occupational Safety and Health.

The risk of splashing and dripping during the replacement of barrels or other containers can be substantially reduced by using snap-coupling systems.

It is important that disinfected seed should be stored separately and be correctly marked, so as to prevent untreated seed or other feed products

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being contaminated by seed disinfectant or mixed with disinfected seed. Provisions issued by the Swedish Board of Agriculture concerning Packaging for Disinfected Seed (SJVFS 1991:95) prohibit the re-use of certain packagings.

A space for disinfection, bagging, bag-filling or storage of disinfected seed should be easy to keep clean. It is important that the floor, walls and roof of disinfection premises should be kept clean, so as to reduce the production of dust. Sweeping should not occur. Dust should be removed in an appropriate manner, e.g. by vacuum cleaning. When selecting vacuum cleaners and vacuum cleaner filters, it is important to consider the particle size of the dust, so as to choose a filter with an adequate separating efficiency, or alternatively to use a central cleaning system where the exhaust air is extracted from the premises. Vacuum cleaning is an unsuitable method when using highly volatile pesticides, and cleaning should then be done by means of flushing instead. The Environmentally Hazardous Activities and Health Protection Ordinance (SFS 1998:899), however, stipulates that flushing water may not be discharged into sewers or drains.

It is appropriate for signs showing that seed disinfection is in progress to be put up near the space concerned, e.g. on a door.

## **Treatment of conifer seedlings**

From a work environment viewpoint, it is an advantage for non-chemical insecticides to be used wherever possible.

When approving pesticides for the treatment of conifer seedlings, the National Chemicals Inspectorate defines certain conditions for their application. This normally takes place centrally, in a nursery or suchlike facility. Treatment, using special equipment, of seedlings which have already been planted is permitted for certain pesticides.

A dipping facility and spraying facility should be positioned on an underlay consisting of resistant material. It is important that the facility should have a collecting device for spillage, e.g. a trough or gutter.

Efforts should also be made to manage the insecticide treatment of the plants in such a way that the pesticide is deposited on the root collar and lower part of the trunk and not on the needles.

For the prevention of pesticide leakage in transit, it is important that the plants should be allowed to drain properly after treatment and the wrapping should be resistant to moisture and mechanical interference.

When seedlings are delivered, it is important that the employer and the persons who will be handling them should be told what pesticide or pesticides the seedlings have been treated with and when the treatment took place.

### **Planting of conifer seedlings**

Hermetic wrapping for the storage of treated conifer seedlings should be opened so that volatile substances are aired away before the seedlings are put out at the plant point. Airing should take place in thoroughly ventilated conditions, preferably out of doors.

For the avoidance of dust, bundles of treated seedlings should be moistened before being taken apart.

The person planting treated conifer seedlings is liable to be exposed to pesticide. The risk of percutaneous uptake or other dermal effects is augmented by contact with sharp needles. Personal protective equipment should include protective gloves with long cuffs, e.g. plastic-treated knitted fabric gloves, which can very well be combined with detachable wristlets. In situations where workwear does not provide complete protection against pesticide residues on the seedlings, personal protective equipment should also include clothing with long sleeves and long legs of a material which the needles cannot penetrate. Footwear should also be selected with reference to the risk of exposure to pesticide and sharp conifer needles.

The rules prohibiting the employment of minors on work using Class 1 and 2 pesticides and concerning various exceptions to this prohibition also apply to work with seedlings which have been treated with such substances.

### **Industrial wood preservative treatment**

Wood preservative treatment is usually taken to comprise pressure/vacuum impregnation, dipping and other application of pesticides to wood.

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Work should be conducted in such a way that wood preservative treatment takes place at the latest possible stage of handling operations. It ought preferably to take place after machining of the wood has been completed.

**Work premises**

It is important that the work surface and flooring of the work premises be designed in such a way that any escaping wood preservative will not spread over a large floor area.

When handling wood preservative which contains a flammable solvent, it is important that fire hazards be taken into account. Fire-fighting equipment must be within easy reach. Rescue services should be consulted if there is any uncertainty on matters of fire safety, e.g. concerning suitable fire-fighting equipment and concerning rules with regard to permits etc. for flammable products. Guidance on the design of wood preservative treatment facilities can be obtained from the fact sheet "Wood impregnation, pressure and vacuum impregnation" published by the National Environmental Protection Agency (1998).

**Technical device**

For the prevention of exposure to wood preservative when it is being mixed for use, the mixing operation should take place in a closed system. If this is not possible, the mixing tank should be covered over. In addition to safety gloves and protective clothing, goggles or a face shield may also be necessary.

Mixing tanks and storage tanks should be fitted with overflow and back-siphon prevention devices.

**Impregnation and dipping**

Dipping of timber should be done mechanically and arranged in such a way that the greater part of the wood preservative can run off down into the dripping bath.

To reduce the risk of dermal contact with newly treated timber, the discharge of timber at the end of the impregnation process should be mechanised. The device used for keeping the timber packaged together during impregnation should be easy to unload. Rubber boots, as well as safety gloves, may be



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needed during the treatment of wet, newly treated timber. It is also important to make sure that clothing which has become wet is changed. Ordinary textile and leather working gloves are quite unsuitable, because they absorb pesticide, and, consequently, do not afford any real protection. Contaminated gloves may compound exposure to wood preservatives. Note that glove materials affording good protection in the handling of a certain kind of wood preservative may in certain cases provide none at all when a different preservative is handled. Thus different wood preservatives require different glove materials for proper protection.

It is important that wood preservatives which has come into contact with the skin should be washed off without delay. In the case of water-soluble preservatives, rinsing in water may suffice, whereas creosote, for example, can only be removed with a suitable skin cleaning agent.

After preservative treatment, the timber should be deposited at a special drainage point.

Drying of preservative-treated timber should take place in a separate space or outdoors under cover. Timber treated with a substance containing organic solvent should be dried in a space which is separately ventilated. No other activity should be carried on in a space used for the drying of impregnated timber.

Premises where wet, newly treated timber is impregnated and handled should be cleaned regularly. Flushing with water is often a suitable cleaning method. If there is a risk of splashing in the face, a face shield or suchlike should be used.

The cleaning of premises where preservative treatment takes place or where treated timber is machined entails a risk of exposure to pesticide-contaminated dust. Sweeping can cause atmospheric concentrations of dust which are dangerous to health and is therefore an unsuitable cleaning method. Vacuum cleaning is one example of a suitable method.

### **Timber treated with pesticide**

It is important to bear in mind that manual work with newly treated timber entails a risk of exposure to impregnating agent through dermal contact and through inhalation of vapour, dust or other particles containing pesticide, even after the timber has been drip-dried. Safety gloves must therefore be used.

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Guidance on risk assessment in connection with the simultaneous occurrence of wood dust and wood preservative as an air contaminant is available in the Provisions on Occupational Exposure Limit Values Ordinance (AFS 1996:2) of the National Board of Occupational Safety and Health.

Concerning the delivery of timber impregnated with certain agents, the National Chemicals Inspectorate has laid down rules which are stated in the conditions for approval. These rules stipulate, for example, that timber treated with creosote shall on delivery be superficially dry and non-sticky, and that timber treated with an arsenic agent may be delivered, at the earliest, when fixation of the wood preservative is complete.

Disposal, e.g. burning, of waste from preservative-treated timber is subject to stipulations in the conditions of approval for certain impregnating agents. If there is any uncertainty in matters of waste management, the local environment and health protection office should be consulted.

## **Antifouling treatment**

When spraying antifouling paint, the great risk of exposure makes it important to protect the body with whole-body personal protective equipment made of impermeable material. The following are examples of suitable protective equipment:

- whole-body protective clothing,
- plastic or rubber safety gloves,
- safety hood covering the head and neck and fitting closely on to protection clothing,
- boots or other impermeable footwear,
- respiratory protective equipment, which should take the form of an air-supplied full mask or an air-supplied protective hood.

Persons not belonging to the painting enterprise are sometimes liable to be exposed in the course of painting work. In such cases, where there are several undertakings active in one and the same place, a co-ordinating responsibility exists under the Work Environment Act. This responsibility normally devolves on the undertaking responsible for the worksite.

## **Slime control**

The handling of slime control agent in an industrial facility can affect many people and they may come from different undertakings. The following measures, for example, can simplify handling:

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- descriptions of the care and servicing of containers and of dosing and pumping equipment,
- documentation of piping and plastic tubing installations,
- clear marking of piping and tubing in a distinctive colour and signs reading "Biocid" (biocide) or "Bekämpningsmedel" (pesticide) positioned not too far apart,
- routines for the handling of slime control agents in the event of a leak or some other accident.

The handling of slime control agents is mostly managed by the supplier. Normally the supplier provides a container, pumping apparatus and personnel to take care of servicing and handling. The normal practice is for the undertaking engaged in production at the worksite to have a co-ordinating responsibility for the working environment both towards its own personnel and towards personnel from other firms. This makes it important to have a contact person at the worksite who is responsible for the handling of slime control agent. It is appropriate for this contact person to have access to information concerning routines for handling, product information about slime control agents in use and ready-made routines for dealing with incidents and accidents.

Personnel in the vicinity of storage vessels, dosing equipment, pumping apparatus, piping or tubing, mixing spaces and other places where there is a risk of exposure to slime control agents should be informed of the risks which these agents entail.

## **Guidance on individual Sections**

### **Guidance on Section 1**

Chap. 14, Section 5 of the Environmental Code defines a chemical pesticide as a chemical product intended for the prevention or counteraction of damage or inconvenience to human health or damage to property caused by animals, plants or micro organisms, virus included. There are certain exceptions.

Section 2 of the Pesticides Ordinance empowers the National Chemicals Inspectorate to prescribe that the pesticide provisions of the Environmental Code and the Ordinance shall also be applied to products which, having regard to their properties and use, are closely allied to pesticides. If so, approval requirements under the Ordinance also apply to chemical products of this kind.

Under the Environmental Code and the Pesticides Ordinance, pesticides may not be imported from countries which are not members of the European

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Union, be placed on the market or be used without being approved by the National Chemicals Inspectorate. The Inspectorate may issue Provisions concerning exceptions to these and in individual cases can waive the requirement of approval if there are strong reasons for doing so.

Fields in which the Provisions of the National Board of Occupational Safety and Health on pesticides and materials and products treated with pesticides apply include, for example, work with pesticides in agriculture and horticulture, wood preservative treatment, treatment of conifer seedlings, clearance of housing and storage facilities, use of antifouling products and use of slime control agents in the paper and pulp industry.

Under the Provisions issued by the National Chemicals Inspectorate concerning implementation of the Pesticides Ordinance (KIFS 1989:7), the approval requirement is currently derogated for

- chemical products whose pest control effect is achieved by purely physical means, and for
- chemical products intended for use
  1. as preservatives for chemical products,
  2. as disinfectants against micro organisms,
  3. as agents to combat algae or micro organisms in water, other than in lakes and watercourses, and which are not used in the paper or pulp industry,
  4. or in aquaria.

Pesticide-treated materials include, for example, impregnated or dipped timber, bulbs which have been dipped in pesticide and imported flowering plants which have been treated with pesticide.

**Guidance on Section 2**

Written handling and safety instructions are intended to show the employees in detail how the work is to be done so as to avoid health hazards. It is important that these instructions shall contain particulars of suitable personal protective equipment for different working operations, adjustment and care of personal protective equipment, personal hygiene, first aid measures and detailed instructions for the execution of hazardous operations.

Written handling and safety instructions can be necessary in connection with several different kinds of work using pesticides, such as pesticide spraying in greenhouses, scientific testing of non-approved pesticides or handling of pesticides which, according to their labelling, are skin irritants or can produce allergy through dermal contact.

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An antifouling product is usually defined as paint or some other chemical product containing a growth-inhibiting substance and intended to counteract accretions on underwater surfaces.

### **Guidance on Section 3**

The Provisions issued by the National Chemicals Inspectorate on safety data sheets (KIFS 1994:13) require the labelling of pesticides and safety data sheets to show, among other things, which personal protective equipment is appropriate for working with the agent in question. Additional personal protective equipment may be necessary for certain operations - mixing and cleaning, for example - which entail a major risk of exposure to the agent.

To prevent clothing and skin being contaminated by pesticide, it is important that personal protective equipment should be donned before work begins.

It is important to select safety gloves of a material which affords protection from the pesticide concerned. Suppliers of personal protective equipment can be consulted on the subject of glove materials.

Work with pesticides can result in the contamination of skin and clothing. Depending on which pesticide is being used and how the work is being done, protective clothing may be necessary. During spraying operations in orchards and greenhouses, for example, a hood may also be necessary for the protection of head and neck.

Operations such as the filling and mixing of pesticide entail a major risk of splashing in the eyes and face, and safety goggles or a face shield may thus be called for.

For work which demands respiratory protective equipment and at the same time entails a risk of spray mist, splashing or suchlike getting into the eyes, a full mask is preferable to a combination of half-mask and close-fitting safety goggles. In work which involves a risk of exposure to heavy concentrations of pesticide, pneumatic apparatus with a safety pressure may be needed, e.g. for cleaning the insides of pressure impregnation vessels.

Rubber boots may be needed for work using pesticides, both in greenhouses, in the fields and when walking among newly sprayed growing crops. To exclude the pesticide from boots, trousers should normally be worn outside them. Note that if pesticide has entered boots, these should be discarded if they cannot be adequately cleaned.

It is important to

- keep the protective equipment in good condition,
- clean the equipment after use,

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- wash protective clothing regularly,
- keep safety gloves clean on the inside,
- change contaminated safety gloves and safety clothing without delay, and
- refrain from using ordinary workwear as protective clothing.

Contaminated protective equipment affords poor protection and in some cases no protection at all. Instead, contaminated protective equipment can help to augment exposure to pesticide. Pesticide-contaminated protective clothing should be flushed before it is removed. Protective clothing should be put on outside workwear, so that it can be removed, for example, during breaks and journeys by motor vehicle.

It is not always possible to tell how often personal protective equipment needs to be changed. This is the case, for example, with filters for respiratory protective equipment and also with safety gloves. Much therefore depends on good working routines which afford guidance as to when and how often personal protective equipment needs to be changed.

It is also important not to store personal protective equipment in a space where pesticides are used or kept.

Rules on personal protective equipment are contained in the Provisions on Personal Protective Equipment Ordinance of the National Board of Occupational Safety and Health (AFS 1993:40). Rules on the storage of protective clothing are contained in the Board's Provisions on Personnel Facilities Ordinance (AFS 1997:6). Chap. 2, Section 7 of the Work Environment Act makes it the duty of the employer to provide personal protective equipment when needed.

**Guidance on Section 4**

It is important that pesticide which has come into contact with the skin should be washed off without delay. Where certain pesticides are concerned, rinsing with a large quantity of water is sufficient, while others require some kind of skin cleanser. It is therefore important that washing facilities should be available in immediate proximity to the handling operation. It is very important that people should wash before breaks, meals, visits to the toilet and suchlike.

If pesticide is being handled in a place where a main water supply is lacking, e.g. when working in the fields, it is important that soap and sufficient water should be taken along. Wet wipes are often quite unsuitable as a substitute for soap and water, because their solvent content can facilitate percutaneous uptake of pesticide. There are, however, certain exceptions. For example, there are special wet wipes which can be used for removing isolated patches

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of creosote from the skin. Use of skin cream (barrier cream) can in certain cases facilitate cleaning of the skin but is not a direct safeguard.

When clothing has been contaminated by pesticide in such a way that there is a risk of pesticide being absorbed by the body, it is important that clothing should be changed as quickly as possible and, if necessary, a shower taken. Clothing which is to be re-used must be washed carefully. The person washing the clothing must be informed that there is pesticide on it.

Food, drink and suchlike must be securely stored, e.g. during work in the fields. Otherwise these articles are liable to be contaminated by pesticide drift.

Rules concerning access to equipment for eye-wash and to decontamination showers are contained in the Provisions on Dangerous Substances of the National Board of Occupational Safety and Health (AFS 1994:2). Guidance on the selection and design of this equipment is obtainable from the Board's General Recommendations on Eyewash (AFS 1986:25).

Rules concerning personal hygiene and storage of working clothes are contained in the Board's Provisions on Hazardous Substances (AFS 1994:2) and on Personnel Facilities Ordinance (AFS 1997:6).

#### **Guidance on Section 5**

It is important that no persons other than those taking part in the application work should enter the premises while pesticide is still present in the air in dangerous quantities.

In certain cases it can take a day or more for the atmospheric content of pesticide to fall to an acceptable level from the work environment viewpoint. It can take far longer for the concentration of pesticide on leaves, for example, to fall to a level where personal protective equipment is no longer required.

Signage should normally indicate what pesticide is being applied. The date and commencement time of pesticide application can be a useful item of information, as well as the date and time of permissible access to the premises.

Access to the premises may also be conditional, for example, on thorough airing or on the use of specified protective equipment.

#### **Guidance on Section 6**

Section 12 of the Pesticides Ordinance (SFS 1998:947) lays down that an Authorisation Class 1 pesticide may only be used by personnel meeting specialised knowledge requirements. Under the Provisions (SOSFS 1994:29)

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issued by the National Board of Health and Welfare concerning permission for the use of certain pesticides, everyone taking part in the spreading of Authorisation Class 1 SoX pesticides must have permission to do so. Labelling or exemption conditions indicate when a pesticide requires a Class 1 SoX permit. Work with pesticides in gaseous form can mean a greatly elevated risk of serious injury in the event of accidents. This makes it essential for work to be carefully planned and for operations to be co-ordinated with everybody of whom the work affects. Rules concerning planning, information and instructions are contained in the Board's Provisions on Hazardous Substances (AFS 1994:2)

In order to achieve a high standard of safety when work is being done by more than two persons, it is often appropriate for one person - referred to here as the gas supervisor - to be put in charge of gas application work. It is important for the gas supervisor to have a good knowledge of work using pesticides in gaseous form and to have had experience of similar gas application work. The gas supervisor should be stationed at a point where there is no risk of exposure and from there should arrange continuous contact with the personnel working in areas where there is a risk of exposure. A portable radio transmitter with which contact can be established by means of one simple manoeuvre is a suitable means of arranging auditory contact. A mobile phone is not normally suitable if this means that a new call has to be made every time contact is needed.

It is important that complete personal protective equipment should be available outside and in the immediate vicinity of the place where application is in progress. The gas supervisor or some other suitable person can then enter the premises where application is in progress and provide emergency assistance in the event of an accident.

The number of persons to be considered sufficient for performing the application work will depend on how extensive the work is and on the characteristics of the premises in terms of work and safety. In connection with container gassing or work using a gas chamber, with personnel outside the space where gas is applied, two persons may be appropriate. If gas is being applied on premises where the work is done inside the premises themselves, three may be a sufficient number.

Gas formulations include, for example:

- gas in gaseous form or condensed as liquid, e.g. sulphuryl fluoride or methyl bromide. The gas is discharged from gas cylinders, which means an immediate risk of exposure,
- solid-state pesticides, with which for example phosphine gas only forms on contact with moisture (water) and is then emitted. In this case, there is no risk of gas exposure for some time after application.



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Operations using pesticide in gaseous form include, for example, application, control and airing of the pesticide. In work of these kinds, risks are also entailed by the handling of unused packagings or containers and by checking to see that the packaging or container is empty.

### **Guidance on Section 7**

To simplify cleaning and maintenance, it is appropriate that the flooring material should be concrete with a suitable surface coating.

Irregularities and pitting in the floor may contain wood preservative which has dried in and thus may be more heavily concentrated than the solution for application. Any pits and irregularities in the floor should therefore be filled without delay. Under Sections 5 and 6 of the Environmentally Hazardous Activities and Health Protection Ordinance (SFS 1998:899), permission must be obtained from the county administrative board for "wood preservative treatment by pressure or vacuum impregnation or dipping where wood preservative is used". The conditions to which permits of this kind have customarily been made subject by the county administrative board under stipulations previously in force generally included conditions relating to the floor structure, e.g. a fully enclosed concrete slab with no floor drains.

### **Guidance on Section 8**

The risk of exposure to pesticides can be reduced by remote-controlled opening of the cover. Other precautions include, for example, placing an extraction device or suchlike above the cover. It is important that there should be no possibility of the cover of the pressure vessel opening when the pressure vessel is pressurised or full of liquid.

### **Guidance on Section 9**

The delimited area can in certain cases be reduced by screening to prevent the propagation of spray mist, splashes etc. Note that wind conditions can also affect the spread of spray mist and, accordingly, the size of the restricted access area.

In certain cases the risk of splashing or dripping of antifouling paint may necessitate implementation of the rules concerning a specially marked area to the painting of ships with brush or roller.

### **Guidance on Section 10**

Note that ships which have been antifouling-painted abroad may have been treated with an antifouling product which may not be used for painting in Sweden and the removal of which can entail greater risks than a product permitted in this country.

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It is essential that antifouling paint removal should wherever possible be performed by a method which does not generate dust. See also the Board's Provisions on Measures Against Air Contaminants for the Prevention of Ill-health (AFS 1980:11).

Paint removal by blasting may necessitate particularly far-reaching safety precautions. It is appropriate for this work to be done within a specially marked area, just as with spray application. It is important that the paint removed, paint-contaminated blasting agent and flushing water should be safely disposed of.

Health-endangering smoke is emitted when sheet metal coated with antifouling paint is welded and cut. To prevent this happening, the paint should be removed within an area of 10 cm or more from the heat application point prior to welding or cutting.

**Guidance on Section 12**

It is for the most part appropriate that supervisory personnel, head workers of the treatment plant or suchlike should have undergone the training referred to in Section 12. At a workplace where there is shift work, it may be appropriate for more persons to have undergone the training.

A renewed training certificate is normally obtainable after completion of a refresher course.

**Guidance on Section 13**

The National Board of Occupational Safety and Health can revoke permission, for example, if an impregnation facility displays such deficiencies that operational safety is jeopardised or if the activity is otherwise conducted in an unacceptable manner. The latter may be the case, for example, if given handling and safety instructions are not complied with or if there is non-compliance with Provisions on the inspection of certain equipment in the pressure impregnation plant.

The condition that a person referred to in Section 12 (2) shall normally be present at the workplace does not mean that the permission ceases to apply if that person is absent for a few days by reason of illness or suchlike.

**Guidance on Section 14**

The stipulations of Section 14 also apply when a renewed application is made.

**Guidance on Section 14 (2)**

The duties may, for example, be those of a supervisor, a head worker of the treatment plant or operator.

**Guidance on Section 14 (3)**

"Type of agent" refers to the active component or components, e.g. creosote, included in the agents used.

**Guidance on Section 14 (4)**

The description should, for example, indicate the type of equipment, container dimensions, last inspection date (where relevant), and also whether different operations are automated or manual and whether equipment is remote-controlled.

**Guidance on Section 14 (8)**

It is important that, over and above what is indicated in the guidance on Section 2, the instructions should also contain particulars of measures to be taken in the event of spillage or leakage capable of causing harm to the working environment or the external environment. It is also important that measures to be taken after work is over, e.g. tidying up and cleaning, as well as waste disposal should be included in the instructions.

**Guidance on Section 14 (9)**

The statement should make clear whether the safety delegate seconds the grant of permission. If this is not seconded, the reasons for not doing so should be included in the statement. Note that if there is no local safety delegate at the worksite, a statement is to be appended from a regional safety delegate, if one exists.

**Guidance on Section 15**

Under Section 12 of the Pesticides Ordinance, Class 1 pesticides may only be used by personnel meeting special knowledge requirements. Provisions concerning knowledge requirements are issued by the supervisory authority. One good way of ensuring that personnel acquire good knowledge is for them to undergo the type of training referred to in Section 12. As regards persons other than those specially referred to in Section 14 (2), however, the requirement of good knowledge can also be met in other ways. The stipulation in Section 15 means that the employer or his counterpart must verify that personnel have sufficient knowledge. Stipulations concerning training and knowledge are also contained in Chap. 3, Section 3 of the Work Environment Act.

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### **Guidance on Section 16**

Class 1 antifouling products carry the supplementary designation ASS, which means that permission for their use is granted by the National Board of Occupational Safety and Health.

### **Guidance on Section 18**

Thus a training certificate is valid at most for five years from the date of issue. A renewed certificate is obtainable on completion of a refresher course.

Note that **all** personnel taking part in the painting work shall have undergone the training provided by the National Board of Occupational Safety and Health.

### **Guidance on Section 19**

The provisions of Section 19 also apply in connection with renewed application.

#### **Guidance on Section 19 (1)**

The employer referred to here is the employer of the persons employed on antifouling treatment.

#### **Guidance on Section 19 (2)**

The description of equipment should, for example, indicate the type of applicator equipment used and the pressure employed for spray application.

#### **Guidance on Section 19 (4)**

It is important that, over and above what is indicated in the guidance on Section 2, the instructions should also contain particulars of measures to be taken in the event of spillage or leakage capable of causing harm to the working environment or the external environment. It is also important that measures to be taken after work is over, e.g. tidying up and cleaning, as well as waste disposal should be included in the instructions. Since the instructions have to be detailed and adapted to conditions at the individual worksite, it is not possible for the same instructions to be used at all worksites. This is why the National Board of Occupational Safety and Health calls in examples of instructions.

#### **Guidance on Section 19 (5)**

The statement should make clear whether the safety delegate seconds the grant of permission. If this is not seconded, the reasons for not doing so should be included in the statement. Note that if there is no local safety delegate at the worksite, a statement is to be appended from a regional safety delegate, if one exists.

**Guidance on Section 20**

Chap. 29, Section 8 of the Environmental Code contains stipulations on penalties for persons infringing Provisions issued by the Government, or by an authority appointed by the Government, e.g. concerning special conditions for the handling of chemical products.