

The use of carcinogenic substances and materials on board ships

When using carcinogenic substances and materials on board, you must take some precautions.

This folder informs about the way in which regulations from the Maritime Authority can be used in practice. It contains a checklist with 6 items on which you can act before working with substances and materials.

At the back you will find an alphabetical list covering the carcinogenic substances which are the most used on board ships.

Furthermore, a folder about transport of carcinogenic substances and materials as cargo in ships has been published.

How to obtain information

Before you buy and use chemicals it is important to know if they are hazardous and whether they are carcinogenic.

First of all you can read the label. The label may be marked with one of the following three sentences:

1. "Possible risks of irreversible effects" (R40)
2. "May cause cancer" (R45)
3. "May cause cancer by inhaling" (R49)

However, only a part of the carcinogenic substances shall be marked on the label. Therefore, you also have to check the risk assessment concerning hazardous risks. The names of the substances making the product hazardous must appear from the risk assessment and the label.

Regulations

About 400 substances are considered carcinogenic in Denmark today. They are all mentioned in annex 1 in the regulation that is popularly called the Cancer Regulation, (Technical regulation on working environment in ships, "Information from the Danish Maritime Authority A", chapter II C regarding carcinogenic substances and materials, including asbestos and mutagens).

Many of the substances, stated in the Cancer Regulation, you will never be confronted with during your work on board. Therefore, a list has been prepared covering the carcinogenic substances you are most likely to encounter. You will find the list in alphabetical order at the back of this folder.

The list will not cover all carcinogenic substances and materials used on board. If you are going to use special products it is necessary to check if all the different substances are mentioned in the Cancer Regulation. The regulation is revised concurrent with the development. Information about changes in the Cancer Regulation is given in Notice from the Danish Maritime Authority.

Working processes

You shall know that certain working processes may develop carcinogenic substances and materials, even from quite ordinary products that you may regard as harmless.

This is especially the case when oil products are heated or combusted. This may produce carcinogenic substances or materials (exhaust gas from petrol- and diesel engines as well as used oil).

These may be absorbed by:

- skin contact (used oils) and
- breathing in particles (exhaust from diesel engines)

Risk assessment helps finding and removing the risk

It will be a great advantage if your shipping company takes charge of all the purchases of chemicals, and from the very beginning ensures that the products do not contain carcinogenic substances.

A carcinogenic substance may often – without any problems – be substituted by a harmless or less hazardous substance. If this is the case the substance in question *must* be replaced. If this - under special circumstances – cannot be done, a written statement must be issued to the safety organization.

If it is necessary to apply a carcinogenic substance or material or if a working process develops carcinogenic substance, a written risk assessment must always be prepared. The safety organization must be involved in this work.

The risk assessment shall secure that you will not get exposed to carcinogenic substances. This means that working methods that exclude or limit the contamination as much as possible must be used – in special cases the work must be carried out in a closed plant. The substance hydrazine, which earlier in some ships was used as a supplement to the boiler water, is now forbidden.

If you are going to work with carcinogenic substances it is important to know that there are – among other things - requirements to handling waste and for an alarm on the ventilation systems.

Special regulations apply when working with asbestos – these regulations are in annexes 2 and 3 of the Cancer Regulation.

The Danish Maritime Occupational Health Service has prepared examples of specific risk assessments for carcinogenic substances. They can be used as inspiration when your safety organization gets started.

If you have questions please contact:

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- Danish Fishermen's Occupational Health Service
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Working systematically – checklist

The checklist below may help you to discover, whether there are carcinogenic substances in a product – and what to do before working with them.

1. Check label and the workplace instruction. Look after the warnings “Possible risks of irreversible effects” (R40), “May cause cancer” (R45), or “May cause cancer by inhaling” (R49) on the label. Also look in the workplace instruction - the part about “hazardous influences”.
2. If there is nothing about risk of cancer, then do not feel secure after all. If you purchase products abroad it is not certain that they have classified carcinogenic substances as in Denmark. And every day new carcinogenic substances are detected. For this reason, it is better to check the label or the workplace instruction for substances mentioned in the list at the back of this folder or possibly in annex 1 of the Cancer Regulation.
3. If stated on the label or the workplace instruction that the product contains – or develops when used – substances or materials that are on the list of carcinogenic substances and materials, then do not use the product unless it is strictly necessary for technical reasons.
4. If it is not possible for technical reasons to replace the product with a less hazardous one this must be documented in writing to the safety organization of the ships.
5. However, if it is necessary to use the product, the provisions of the Cancer Regulation shall be followed. This includes making sure that a risk assessment is prepared in writing.
6. Among other things, the regulation requires that by technical precautions it shall be secured that the employee is not exposed to dust, vapours, or smokes from the product. If it is technically impossible to avoid exposure, suitable personnel protective precautions and special work clothing must be supplied.

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Selected substances that are regarded as being carcinogenic

Acrylamide
4-Aminobiphenyl (F) and salts thereof
Aniline
Asbestos (F)
Benzene (F)
Benzidine dyes (F)
Bis(2-chloroethyl)ether see 2,2'-Dichlorodiethyl ether
Bis(chloromethyl)ether*
Lead acetate
Lead chromate, see chromium compounds
Lead phosphate
Lead subacetate
1,3-Butadiene
Butane, which contains >0,1% 1,3 butadiene*
Cadmium inorganic compounds* (including among others cadmiumsulfide)
Carbon tetrachloride, see tetrachloromethane
Chloroform (F)
Chromium compounds* (including among others lead chromate, strontium chromate, zinc chromate)
1,2-Dibromoethane*
2,2'-Dichlorodiethyl ether
Dichloromethane (F)
Diesel oil for marine engines
2,4- and 2,6 Diisocyanate toluene (TDI)
N,N- Dimethyl formamide
1,4-Dioxane*
Epichlorohydrin*
Formaldehyde (F)
Glass wool fibres, see synthetic mineral fibres
Hydrazine and salts hereof (F)
Isobutane, which contains >0,1% 1,3 butadiene*
Isoprene
4,4- Methylenebis (2-chloroaniline) and salts hereof*
Methylenechloride see Dichloromethane
4,4'-Methylenedianiline* (Araldit hærdet 972)
Nickel compounds including among others inckeldust*
Nitrobenzene
2-Nitropropane*

Carbon black

Strontium chromate (Pigment yellow 32) see Chromium compounds, hexavalent

Styrene*

Synthetic mineral fibres*

Tetrachloro ethene (F)

Tetrachloroethylene see tetrachloro ethene

Tetrachlormethane (F)

Zinc chromate see Chromium compounds, hexavalent

It is forbidden to apply the substances marked F. Particularly severe provisions apply to the substances and materials marked *. Concerning these severe provisions reference is made to the Cancer Regulations, annex 1, which contains a complete list.