

Self diagnosis

Do you work with isocyanates?

Part 1.

Do the chemical products (e.g. glue and paint) contain isocyanates?

Do you ever use chemical products (paint, glue or other chemicals) in the following types of work:

Making **foam plastic, foam insulation** or injecting joint sealing compound?

yes no

Making **urethane rubber**?

yes no

Casting using the **cold-box method**?

yes no

Using adhesives?

yes no

Painting or varnishing?

yes no

Sealing concrete cracks?

yes no

Using underseal compound for vehicles?

yes no

Using putty on vehicle bodywork?

yes no

Applying flooring compound?

yes no

If you have answered no to all the questions. – You are probably not working with isocyanates. You need, however, to check if there is a possibility of isocyanates generating. **Proceed to part 2:** Can isocyanates be generated at the workplace? **If you are unsure**, continue reading.

If you answered yes to at least one of the questions. The chemical products you are using may contain isocyanates. The products above that are shown in bold letters almost always contain isocyanates. You will need to look at the packaging or read the safety data sheet,¹⁾ for all the other products, and check the contents.

To check whether products contain isocyanates, answer whichever one of the following three questions is easiest to answer.

Does the packaging/wrapping state "Contains isocyanates. See information from manufacturer"?

yes no

Under heading 2 of the safety data sheet, does it state that any of the following chemicals are included:

Isocyanates (often preceded by a term, such as toluendi-isocyanate) or TDI, MDI, IPDI, HDI, NDI, DIFPI (common abbreviations for various isocyanates)?

yes no

Contact the manufacturer and ask the question: "Are there any isocyanates or polyurethane in this product?" (Demand that the manufacturer sends you a safety data sheet.)

yes no

Do not put the safety data sheets away before you have answered the questions in part 2!

If you answered no. You are not working with isocyanates. However, safety data sheets may not be absolutely correct, and may contain erroneous information. Are you sure you are buying the chemicals from a bona fide supplier? **Go on to part 2:** Can isocyanates be generated at the workplace?

If you answered yes. You are working with isocyanates. Precautions and training are needed. Those who work with products containing isocyanates or who may be exposed to isocyanates formed as a result of thermal breakdown must receive training about the risks involved in their work. **This is regulated in EU directive 98/24/EG, Article 8**, Information to and training of employees, and elsewhere. If you have not received any training, contact your employer, who is required to provide it.

1) A safety data sheet is to be included with the chemical product (e.g. the adhesive, paint, etc). It is the duty of the supplier to provide the safety data sheet. The safety data sheets are often saved in a binder and stored with the supervisor or production manager.

Part 2.

Can isocyanates be generated at the workplace?

Even if you are not working with isocyanates, isocyanates can still form when carrying out certain operations.

Do you ever work with:

Welding?

yes no

Cutting with cutting torches?

yes no

Cutting with hot wire?

yes no

Hot air?

yes no

Gas flame?

yes no

Soldering?

yes no

Sawing?

yes no

Grinding?

yes no

Cross-cutting?

yes no

Hot-box casting?

yes no

Heating material to over 150°C by any other method?

yes no

If you have answered no to all the questions above.

You are not running any risk of exposure to isocyanates formed through heating (or heat-generated isocyanates) in your work. You do not need to continue read further.

If you have answered yes to one or several of the questions. All these actions raise the temperature, i.e. the material gets warm or hot. If it gets hot, i.e. temperature exceeds 150°C even a tiny fraction of the material heated can emit smoke and gases. These gases can contain isocyanates if the material is made of polyurethane or contains a mixture of phenol or formaldehyde and urea.

Answer the following questions and we will help you find out if the material you are heating can form isocyanates.

Can any of the following materials be heated (remember that the material can be inside or behind that which you can observe being heated)?

Flexible or rigid foam plastic?

yes no

Insulation made of foam plastic?

yes no

Urethane rubber?

yes no

Painted or varnished surfaces?

yes no

Glue joints, also any hidden glue joints?

yes no

Underseal compound for vehicles?

yes no

Printed circuit cards?²⁾

yes no

Joint sealing compound?

yes no

Putty for use in vehicles bodywork?

yes no

Sealing compound for concrete cracks?

yes no

Insulation with mineral wool?

yes no

2) Printed circuit cards and the protective varnish on these contain polyurethane. Varnish without polyurethane does exist, but is uncommon.

Resin for hot-box casting?

yes no

Optical cables³⁾?

yes no

Copper wire⁴⁾?

yes no

If you have answered no to all these questions. There is minimal risk that isocyanates are being generated at your workplace. You do not need to read further. **Are you unsure?** Answer the following questions since some uncommon materials can also contain polyurethane or other materials that can generate isocyanates if they are heated.

If you have answered yes to one or several of the questions? There is a risk that isocyanates are generated. Those products shown in **bold** type almost always contain polyurethane or other chemicals that can generate isocyanates if they are heated enough. Other materials can also contain polyurethane.

How can you find out if a product contains polyurethane? The easiest way is if the basic chemicals have been used within your own company, i.e. you did the coating, gluing etc. In this case you have full access to the packaging or safety data sheets and can see for yourself what is in the products. In other cases, you will need to contact the companies that supplied the materials or the products containing the materials.

Get the safety data sheets for the raw materials of the products/materials that are being heated.

Under heading 2 of the safety data sheet, does it state that any of the following chemicals are included: Isocyanates (often preceded by term, such as toluendi-isocyanate) or TDI, MDI, HDI, IPDI, NDI, DIFPI (common abbreviations for various isocyanates)?

yes no

Does it state the material contains prepolymerised isocyanates or polyurethane (PUR, PU)?

yes no

Under headings 10 or 16, does it state that isocyanates can be generated in conjunction with heating (e.g. welding, etc)?

yes no

Have you gathered this information for all the different materials that can be heated and **have you answered no?** Then the risk is small that isocyanates are being generated. You do not need to read further.

If you have answered yes to any of these questions.

Isocyanates may be generated in connection with heating. You have to take action in order to avoid risks of injury through isocyanates.

Are you still unsure if isocyanates are being generated or have you been unable to get all the information?

Remember that safety data sheets can contain errors. Answer the following question:

Has anyone working in the situations where isocyanates may be generated shown any symptoms relating to respiration, nasal congestion, runny nose, dry cough, nose bleeds or other diffuse symptoms such as eye irritation, headaches or feeling heavy-headed? (After a time, you may also feel tired more easily, or develop asthma-like symptoms after working under these conditions.)

yes no

If you answered yes. These symptoms can occur after inhaling isocyanates (but they must not be mistaken for the common cold). If anyone has had these symptoms it is important to take action, so that the symptoms do not develop into life-long asthma, which could mean you have to leave your present job due to health reasons.

If you answered no. There is unfortunately no guarantee against isocyanates being generated, however, but if they are being generated, it seems that no one has been injured by it yet. You may still need to make more thorough checks whether the products used contain polyurethane and can generate isocyanates if heated (e.g. questionable material can be sent for testing) or take other measures.

What you can do is to avoid heating so that isocyanates cannot be generated. If this is not possible, try to find out which, if any, of the products contain PUR and either change it to another product or avoid exposing it to heat. If none of these measures work, it will be necessary to use screens and extremely well ventilated areas for the work in question. This will prevent the spread of isocyanates to the person doing the work as well as those working nearby. Contact the company health service if you need help.

3) Optical cables have a protective varnish made of acrylate which usually contains some polyurethane.

4) Copper wire is normally thinly varnished with a protective varnish containing polyurethane.

Further reading:

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