2-pack isocyanate paints

The DOs and DON'Ts

**DO**
- Ensure that all work with 2-pack paints is properly managed and supervised.
- Prevent or control exposure to isocyanate mists and vapours as far as practicable.
- Wear an air-fed respirator/visor where mists or vapour may be present, especially when spraying or brush/roller painting on areas over 10 cm².
- Ensure that the air supplied to the air-fed respirator/visor is clean and the required pressure maintained. Check all filters in the air supply system regularly.
- Wear clean and disposable overalls, gloves and face/eye protection when mixing paint or brush/roller/spray painting to prevent isocyanates splashing onto your skin.
- Leave the vehicle/panel in the spray booth/enclosure/bake oven with the doors closed while the paint hardens/cures.
- Maintain all extraction equipment to ensure that it effectively controls exposure. Change filters regularly. Thoroughly examine and test your equipment at least every 14 months (keep records for at least 5 years).
- Ensure booths are not leaking. Monitor the effectiveness of the controls, possibly by air sampling or biological monitoring.
- Provide health surveillance for employees exposed to isocyanates.

**DON'T**
- Mix, brush/roller, spray or harden/cure 2-pack paints unless the risks and precautions to be taken have been identified.
- Allow untrained employees to carry out any work with 2-pack paints. Do ensure that the hazards and precautions are fully understood.
- Mix/brush/roller 2-pack paints except in a well-ventilated booth/enclosure or mixing room with the doors closed.
- Spray 2-pack paints in an open workroom. Work only in a well-ventilated booth/enclosure with the doors closed.
- Lift or remove your respirator/visor while spraying (even to inspect newly painted areas) and, if remaining in the booth, wait for at least 10 minutes or until the vapour has cleared.
- Allow unprotected people inside the spray booth/enclosure/bake oven during or immediately after spraying or hardening/curing.
- Keep respirators/visors, gloves or overalls in the spray booth/enclosure or hardening/curing oven. DO store them in a locker/clean area. DO check that they are in order before use.
- Clean spray-guns in an open workroom. DO use an enclosed gun-cleaning machine or similar.
- Wait until early asthma symptoms occur. It’s too late then!

Do you work with 2-pack isocyanate paints? If so, you could be at risk from asthma or skin or eye disorders.
arrangements for prompt reporting of symptoms of sensitisation and how to report them. Give copies of the authorisation to all employees and explain the risks from inhalation and contact with eyes and skin. Allow employees to be informed of the dangers of uncontrolled releases of isocyanates. Health surveillance at work

What are the dangers?

Isocyanates are very reactive substances that, if inhaled in the monomer or prepolymer form, can cause immediate or delayed asthma. If inhaled or mixed with other materials, they may produce a range of other toxic effects including irritation of the respiratory tract, skin, eyes, and nervous system. They can also cause sensitisation reactions, which may be rapid or delayed. Immediate asthma reactions may be severe and life-threatening. Isocyanates are known to cause bronchial asthma and immediate asthmatic reactions in some people. They can also cause sensitisation reactions, which may be rapid or delayed. Immediate asthma reactions may be severe and life-threatening.

Introduction

2-pack paints, in which isocyanate hardener or activator is added to a pigment to make the paint. 2-pack paints are used extensively in motor vehicle repair (MVR) for repairing and refinishing vehicles. This guidance is aimed at employers, self-employed people, supervisors and anyone involved in using or handling isocyanates in MVR. A health surveillance service is in place to identify any health hazards, eg:

- respiratory sensitisation
- respiratory illness
- eye irritation
- skin irritation
- dermatitis
- nausea
- headaches
- dizziness
- fatigue
- irritability
- depression
- anxiety
- sleep disorders
- cognitive function problems
- memory problems
- mood disorders
- lower respiratory tract disease
- upper respiratory tract disease
- sinusitis
- chronic rhinitis
- chronic cough
- chronic laryngitis
- chronic bronchitis
- asthma
- emphysema
- chronic obstructive pulmonary disease
- chronic obstructive pulmonary disease (COPD)
- pneumoconiosis
- cancer of the lung.
- skin cancer.

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in complying with the regulations. It is intended for use in the workplace, but is applicable elsewhere. It is not intended to be a complete guide to the issues involved. It is not a substitute for the advice of a professional person.

References from HSE books

1. Isocyanates: Health hazards and precautionary measures Environmental Hygiene Guidance Note 16 (Fifth edition) 1999 ISBN 0 7176 1701 7
2. COSHH Essentials: Easy steps to control chemicals. Control of Substances Hazardous to Health Regulations HSG167 (Second edition) 2003. ISBN 0 7176 1279 1
3. Organic isocyanates in air MDHS25/3 (Third edition) ISBN 0 7176 1668 1
4. Maintenance, examination and testing of local exhaust ventilation systems. HSG54 ISBN 07176 1806 5
5. Respiratory sensitisers and COSHH: Freely breathing
   - An employer’s leaflet on preventing occupational asthma ISBN9569(rev2) (single copies free or priced at 25
   ISBN 0 7176 0914 6)

Further information

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Spraying 2-pack paints produces the highest exposures and is one of the main causes of occupational asthma in the UK. The fine airborne isocyanate mist is not visible under normal lighting and people may not be aware of the risk. Although brush or roller painting of 2-pack paints may not create much mist, small amounts of isocyanate vapours released during the process may also be a risk to health. Exposures could also occur during paint mixing, hardening or curing of painted surfaces, and cleaning of spray guns.

If inadequately controlled, isocyanate mist and vapours may spread beyond immediate work areas, putting the health of other people, eg members of the public, at risk.

When using 2-pack paints for refinishing or repairing, including small areas of work such as scratches and stone-chips (SMART repairs), your precautions must ensure that exposure of the user and others, eg in the case of isocyanate curing, is kept as low as is reasonably practicable. Effective control measures (see below) can reduce exposures to non-detectable levels and certainly well below UK exposure limits.

What precautions should be taken?

Do not do any work involving 2-pack paints without a suitable and sufficient assessment of the risks to the health of anyone who may be affected (see COSHH essentials). All work with 2-pack paints must be properly managed, and everyone involved, including managers and supervisors, sufficiently trained to understand the hazards and precautions. Training should include the emergency action for dealing with spillages of material containing unreacted isocyanate or release of isocyanate vapour, as well as the treatment of splashes onto the skin or eyes.

Paint spraying

Control the spread of paint mist. Only spray 2-pack paints in an enclosed and adequately ventilated spray booth or enclosure. Filter emissions and discharge to a safe place in the open air.

Reduce the risks from inhalation and contact with eyes and skin. Wear appropriate RPE and other protective clothing. Ensure proper fit and use of RPE. Use a full-face, air-fed respirator or face visor for spraying, wear a full-face, air-fed respirator or face visor for spraying, and regularly check any filters in the respirator. Do not remove RPE to inspect newly painted areas. (NB: Airborne isocyanates may remain at high concentrations after spraying - for ten minutes or more, even with the ventilation system running.)

Paint mixing and brush or roller application

Minimise vapour levels in the breathing zone of the mixer / painter. Carry out this work in a well-ventilated area (at least ten air changes per hour) mixing/painting room with the doors closed or a ventilated booth/enclosure. Wear appropriate respiratory protective equipment (RPE) for brush/roller painting jobs greater than 10 m².

Reduce the risks from splashing onto the skin and into the eyes. Wear appropriate personal protective equipment (PPE).

Respiratory protective equipment (RPE)

Wear a full-face, air-fed respirator - this offers the best protection; full-face, air-fed respirator - this is the most commonly used RPE equipment in MVF; positive-demand, half-face, air-fed respirators - must be worn with suitable eye protection, eg full-face visor. (NB: On its own, this type of RPE provides a lower level of protection than is offered by RPE that includes eye protection.)

Seek your supplier’s advice on how to check that the RPE fits the wearer correctly and follow their instructions on cleaning, inspection and maintenance. Do not store RPE in the spray booth/enclosure or anywhere where it could be contaminated.

The quality and quantity of breathable air supplied to RPE are very important. Site the air inlet so that clean air is drawn into the compressor, and regularly check any filters in the line. Ensure the compressor is capable of providing the required supply of clean air and that air monitoring equipment in the system is in use at the same time. Follow maintenance schedules recommended by the compressor manufacturer and check breathing air quality.

Other personal protective equipment (PPE)

Where there is a risk of splashing, wear coveralls and hard (eg soft nitrile, latex-free gloves) and eye protection. During spraying, wear a full-face, air-fed respirator or face visor for face protection from isocyanate hardener, and correctly fitted and properly maintained and do not store it where it could be contaminated.

Health surveillance

High-level health surveillance is normally needed for people exposed to isocyanates. (It should be carried out by an occupational health nurse or medical practitioner familiar with the principles of health surveillance and the risks of the process, and should include:

- a pre-employment assessment, including baseline lung function measurement;
- a list of checks and tests to identify relevant symptoms (at six and 12 weeks after starting work with isocyanates, and then annually);