RESPIRATORY SENSITISERS

1. WHAT ARE RESPIRATORY SENSITISERS?
Respiratory Sensitisers or Asthmagens are substances capable of causing an irreversible allergic reaction in the respiratory system.

2. WHAT ARE THE SYMPTOMS OF RESPIRATORY SENSITISATION?
Once an individual becomes sensitised, they will develop symptoms even when exposed to the smallest concentrations of the Asthmagen. These symptoms include: Asthma-like symptoms (e.g., difficulty breathing, wheezing); Rhinitis (running nose and eyes) and Conjunctivitis (prickly, itchy eyes). Delayed symptoms are often most severe after work or during the night. Sometimes, the individual may not link these symptoms to their work.

3. HOW LONG AFTER EXPOSURE TO A RESPIRATORY SENSITISER, WILL IT TAKE TO BECOME SENSITISED?
An individual may become sensitised to an Asthmagen after several months, or even after years of being exposed to the asthmagen. Once an individual becomes sensitised they may develop symptoms immediately or within a few hours. A person is either sensitised or not, i.e. the allergic reaction is irreversible. It is also an individual response, i.e. not all people will be sensitised working on the same job. For example, two people working with the same sensitiser at the same exposure levels, one person could become sensitised within hours, while the other could work for years without becoming sensitised.

4. WHAT SUBSTANCES ARE RESPIRATORY SENSITISERS?
Most respiratory sensitisers are labelled with the Risk phrases R42 or R42/43. The R-phrases of substances can be found on the Material Safety Data Sheet for a particular substance. A substance containing the R-phrase R42 means it ‘May cause sensitisation by inhalation’. A substance containing the R-phrase R42/43 means it ‘May cause sensitisation by inhalation and skin contact’. Examples of substances with a R-phrase of R42 are isocyanates, which are found in 2-pack polyurethane paints.
Respiratory sensitisers are also defined in EH40. EH40 is a document printed by the HSE that lists the current Occupational Exposure Limits (OEL) for a number of commonly occurring hazardous substances. All substances, within EH40, that are respiratory sensitisers, are listed with ‘Sen’ notation in the ‘notes’ column of the OEL tables.
There are, however, other respiratory sensitisers, which are not always classified via the above 2 routes.
The Table below presents a list of commonly occurring respiratory sensitisers.
### INDUSTRIAL PROCESSES

**Ethylenediamine (EDA)**
- Industry: Pharmaceuticals, Industrial Chemicals
- Substance: Respiratory Irritant
- Other Hazards: Corrosive, Mucus and Respiratory Irritant, Dermatitis
- Occupational Exposure Limit (OEL): 10 ppm OES

**Isocyanates**
- Industry: Polyurethane foams
- Substance: Skin, Eye and Respiratory Irritant
- Other Hazards: Skin Sensitizer, Potential Carcinogen.
- Occupational Exposure Limit (OEL): MEL = 0.02 mg m⁻³ 8 hr TWA; 0.07 mg m⁻³ 315 min STEL SEN

**Hexamethylene Diamine**
- Industry: Pharmaceuticals
- Substance: Respiratory Irritant
- Other Hazards: Skin, Eye and Respiratory Irritant
- Occupational Exposure Limit (OEL): MEL = 0.05 mg m⁻³ 8 hr TWA; 0.15 mg m⁻³ 15 min STEL SEN

**Resins**
- Industry: Pharmaceuticals, Industrial Chemicals
- Substance: Skin Sensitizer
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 4 ppm 8 hr TWA; 12 ppm 15 Min STEL

**Resins**
- Industry: Pharmaceuticals, Industrial Chemicals
- Substance: Skin Sensitizer
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 4 ppm 8 hr TWA; 12 ppm 15 Min STEL

**Resins**
- Industry: Pharmaceuticals, Industrial Chemicals
- Substance: Skin Sensitizer
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 0.04 ppm 8 hr TWA; 0.12 ppm 15 min STEL SEN

**Maleic anhydride**
- Industry: Wire enamels, Surface Coating, Wall and Floor covering
- Substance: Conjunctivitis
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 1 mg m⁻³ 8 hr TWA; 3 mg m⁻³ 15 min STEL SEN

**HEAVY METALS**

**Chloroplatinates**
- Industry: Metal Hosing, Catalyst and Electrodes
- Substance: Skin Sensitizer and Irritant
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 0.002 mg m⁻³ 8 hr TWA SEN

**NATURALLY OCCURRING SUBSTANCES**

**Animal Excreta, Secretions (e.g. Urine, Faeces, Fur, Dander, Saliva, Serum)**
- Industry: Agriculture, Pharmaceuticals, Environmental Health
- Substance: None
- Other Hazards: None
- Occupational Exposure Limit (OEL): None

**Crustacean and Fish Proteins**
- Industry: Food Processing Industries
- Substance: None
- Other Hazards: None
- Occupational Exposure Limit (OEL): None

**Flour Dust**
- Industry: Bakeries
- Substance: Eye, Skin and Respiratory Irritant
- Other Hazards: None
- Occupational Exposure Limit (OEL): MEL = 10 mg m⁻³ 8 hour TWA SEN

**Storage Mites**
- Industry: Agriculture, Food processing, Bakeries
- Substance: None
- Other Hazards: None
- Occupational Exposure Limit (OEL): None
RESPIRATORY SENSITISERS

<table>
<thead>
<tr>
<th>Substance</th>
<th>Industry</th>
<th>Occupational Exposure Limit**</th>
<th>Other Hazards #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food additives</td>
<td>Bakeries, Food Industry</td>
<td>None Currently Established</td>
<td></td>
</tr>
<tr>
<td>(enzymes (papain, alpha amylase, proteases))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Softwood Dust</td>
<td>Agriculture, Joinery, DIY</td>
<td>MEL = 5 mg m-3 8 hr TWA SEN</td>
<td>Skin Irritant</td>
</tr>
<tr>
<td></td>
<td>Construction.</td>
<td>(Both soft and hardwood dust)</td>
<td></td>
</tr>
<tr>
<td>Hardwood Dust</td>
<td>Construction.</td>
<td></td>
<td>Nasal Cancer, Skin Irritant</td>
</tr>
<tr>
<td>(includes MDF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Latex</td>
<td>Hospitals &amp; Healthcare</td>
<td>None Currently established</td>
<td>Skin Sensitiser</td>
</tr>
<tr>
<td></td>
<td>Glove Manufacture, Misc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial Process</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes
* This is not an exhaustive list of all Respiratory Sensitisers and should only be used as a guide.
** Occupational Exposure Limit values obtained from EH40/2002: Occupational Exposure Limits 2002 plus the 2003 amendment.
# This is not an exhaustive list of hazards associated with these chemicals and should only be used as a guide.

Abbreviations
- MEL: Maximum Exposure Limit
- OEL: Occupational Exposure Standard
- ppm: parts per million
- mg/m³: milligrams per cubic metre
- TWA: Time Weighted Average
- STEL: Short Term Exposure Limit
- SEN: Capable of causing Respiratory Sensitisation
- SK: Can be absorbed through intact skin

HOW SHOULD EXPOSURE TO RESPIRATORY SENSITISERS BE MANAGED IN THE WORKPLACE?

Employers are required, under the Control of Substances Hazardous to Health (COSHH) Regulations 2002, to carry out a risk assessment (Reg 6). This risk assessment should highlight any respiratory sensitisers that are being used within the workplace.

Employers are also required under COSHH (Regulation 7) to prevent or control exposure to Asthmagens by measures other than the use of Personal Protective Equipment (PPE). Where this is not reasonably practicable, ‘suitable’ PPE including Respiratory Protective Equipment (RPE) should be considered.

If an employer cannot prevent exposure to an asthmagen, as well as controlling the substance, they have the additional duties to set up a system of health surveillance as per Regulation 11, 2(b), and to provide ‘suitable and sufficient’ information and training on the work with asthmagens as per Regulation 12.

The main objective of health surveillance is to keep checks on the health of the individual working with the asthmagen to ensure adverse changes to their health are detected as soon as possible. Health surveillance may take the form of periodic medical examinations but will always include the keeping of an individual health records. These records should be kept for 40 years.

The objectives of providing ‘suitable and sufficient’ information and training is to allow the employee to understand which substances they work with are hazardous, which ones are respiratory sensitisers, what the health effects and symptoms are, the importance of checking their health and attending health screening when requested and how to use the control measures, provided by the employer, properly.

The COSHH Regulations 2002 also detail legal requirements for the employee. Control of hazardous substances is not all about what the employer has to do. In matters to do with protecting employee health and safety, employees should do as instructed by their employers. Employees should attend training & health screening sessions, use control measures as instructed and report any defects to the control measures.
HOW CAN 3M HELP WITH THE CONTROL OF RESPIRATORY SENSITISERS?

3M Occupational Health and Environmental Safety Group have a number of technical bulletins and workplace guidance documents to help employers control the exposure to substances hazardous to health, as well as an unrivalled range of respiratory protective equipment (RPE) and hearing protection products.

The two main areas of concern regarding the selection of RPE are confidence in protection and comfort. Therefore, all 3M products meet the highest technical standards and the highest level of user comfort requirements.

The 3M range includes:
- Maintenance Free Particulate and Specialty respirators
- Reusable Gas/Vapour and Particulate respirators
- Powered air respirators
- Airfed respirators
- Hearing protective equipment
- Sorbent/Spill Kits

Before selecting Respiratory Protective Equipment (RPE), a full risk assessment must be carried out in accordance with the Health and Safety Legislation. If the risk assessment concludes that control of exposure is inadequate, after all other control measures have been considered, a respirator can be evaluated.

The 3M 4-step guide to selecting appropriate respiratory protective equipment is as follows:

1. Identify the hazard
   - is the hazard in particulate form, gas/vapour or a combination of the two?
   - if the hazard is a gas/vapour – does it have good warning properties? A chemical is said to have good warning properties if the level a person can smell/taste the chemical (odour threshold value) is below its Occupational Exposure Limit.

2. Assess the health effects

3. Select a respirator
   - if the chemical is a gas/vapour and does not have good warning properties, a filtered respirator cannot be selected and an airfed respirator should be selected.
   - if the substance is a particulate, select a particulate respirator. The level of protection is dictated by the levels of exposure.

4. Train

For more information on the range of 3M Personal Protective Equipment or for more details about our workplace support tools, call the 3M Health and Safety Helpline – 0870 60 800 60 UK or 1 800 320 500 Ireland.