

CHEMICAL AGENTS – Chemical agents may enter the human body through different pathways: inhalation, ingestion, percutaneous penetration, dermal absorption. The following chemical agents in so far as it is known that they endanger the health of pregnant women and the unborn child:			
List of agents/working conditions	What is the risk?	How to deal with the risk . Examples of preventive measures*	European legislation other than Directive 92/85/EEC
Substances labelled R40, R45, R46, R49, R61, R63 and R64	<p>The substances are listed in Annex I of Directive 67/548/EEC and are labelled with the risk phrases:</p> <p>R40: possible risk of irreversible effects;</p> <p>R45: may cause cancer;</p> <p>R46: may cause heritable genetic damage;</p> <p>R49: may cause cancer by inhalation;</p> <p>R61: may cause harm to the unborn child;</p> <p>R63: possible risk of harm to the unborn child;</p> <p>R64: may cause harm to breastfed babies.</p> <p>The actual risk to health of these substances can only be determined following a risk assessment of a particular substance at the place of work - i.e. although the substances listed may have the potential to endanger health or safety, there may be no risk in practice, for example if exposure is below a level which might cause harm.</p>	<p>For work with hazardous substances, which include chemicals which may cause heritable genetic damage, employers are required to assess the health risks to workers arising from such work, and where appropriate prevent or control the risks. In carrying out assessments, employers should have regard for women who are pregnant, or who have recently given birth.</p> <p>Prevention of exposure must be the first priority. Where it is not appropriate to prevent the risk, control of exposure may be by a combination of technical measures, along with good work planning and housekeeping, and the use of Personal Protective Equipment (PPE). PPE should only be used for control purposes if all other methods have failed. It may also be used as secondary protection in combination with other methods.</p> <p>Substitution of harmful agents should be made, if possible.</p>	<p>Council Directive 98/24/EC (risks related to chemical agents at work)</p> <p>Council Directive 90/394/EEC (carcinogens at work)</p> <p>Council Directive 67/548/EEC (classification, packaging and labelling of dangerous substances) and its amendments</p> <p>Directive 91/155/EEC as amended by Directive 93/112/EEC establishing a system of safety data sheets.</p>

\* The examples in this column are for guidance only. Other preventive measures exist for all the risks listed. It is up to individual employers to select the measures most appropriate to their situation, while complying with applicable Community and national legislation.

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	Industries which use chemicals are referred to the "Guidance on the health protection of pregnant women at work" issued by CEFIC <sup>1</sup> . It gives particular attention to chemical hazards and guidance on risk assessment.		
Preparations labelled on the basis of Directive 83/379/EEC or 1999/45/EC	A preparation containing more than specified concentrations of a substance bearing one of the risk phrases R40, R45, R46, R49, R61, R63 and R64 would be expected to present similar hazards. The prudent employer would apply the assessment principles appropriate for substances to similarly labelled preparation, should these occur on the workplace.	Hazardous preparations should be assessed and risk management action undertaken in the same way as for similar hazardous substances.	Directive 88/379/EEC or 1999/45/EC (classification, packaging and labelling of dangerous preparation) as amended or adapted.
Mercury and mercury derivatives	<p>Organic mercury compounds could have adverse effects on the unborn child. Animal studies and human observations have demonstrated that exposure to these forms of mercury during pregnancy can slow the growth of the unborn baby, disrupt the nervous system, and cause the mother to be poisoned.</p> <p>Organic mercury is transferred from blood to milk. That may pose a risk to offspring, if a woman is highly exposed before and during pregnancy.</p>	Prevention of exposure must be the first priority. Where it is not appropriate to prevent the risk, control of exposure may be by a combination of technical measures, along with good work planning and housekeeping, and the use of Personal Protective Equipment (PPE). PPE should only be used for control purposes if all other methods have failed. It may also be used as secondary protection in combination with other methods.	Council Directive 80/1107/EEC (chemical, physical and biological agents at work) which will be repealed upon transposal by the Member States of Directive 98/24/EC (before 5 May 2001).

<sup>1</sup> Available from CEFIC (European Chemical Industry Council).

<p>Antimitotic (cytotoxic) drugs</p>	<p>In the long term these drugs cause damage to genetic information in sperm and eggs. Some can cause cancer. Absorption is by inhalation or through the skin.</p> <p>Assessment of the risk should look particularly at preparation of the drug for use (pharmacists, nurses), administration of the drug and disposal of waste (chemical and human).</p>	<p>There is no known threshold limit and exposure must be avoided or reduced.</p> <p>Those trying to conceive a child or who are pregnant or breastfeeding should be fully informed of the reproductive hazard.</p> <p>When preparing the drug solutions, exposure should be minimised by the use of protective garments (gloves, gowns and mask), equipment (flow hood), and good working practices. A pregnant worker preparing antineoplastic drug solutions should be transferred to another job.</p>	<p>Council Directive 90/394/EEC (carcinogens at work)</p>
<p>Chemical agents of known and dangerous percutaneous absorption (i.e. that may be absorbed through the skin). This includes some pesticides.</p>	<p>Some chemical agents can also penetrate intact skin and become absorbed into the body, causing harmful effects. These substances are specifically marked in the lists contained in the relevant Directives. As with all substances, the risks will depend on the way the substance is being used as well as on its hazardous properties. Absorption through the skin can result from localised contamination, for example from a splash on the skin or clothing, or in certain cases, from exposure to high atmospheric concentrations of vapour.</p> <p>In the case of agricultural workers, the risk assessment should consider whether there is a residual risk of contamination from e.g. pesticides used at an earlier stage.</p>	<p>Prevention of exposure must be the first priority.</p> <p>Special precautions should be taken to prevent skin contact. Where possible, technical measures to control exposure should be used in preference to personal protective equipment, such as gloves, overalls or face shields. For example, enclose the process or redesign it so that vaporisation is reduced. Where an employee is obliged to use personal protective equipment (either alone or in combination with technical measures), its suitability should be ensured.</p>	<p>Commission Directives 91/322/EEC and 96/94/EC (indicative limit values for chemical agents at work)</p>

<p>Carbon monoxide</p>	<p>Carbon monoxide is produced by using petrol, diesel and liquefied petroleum gas (LPG) as a source of power in engines and in domestic appliances. Risks arise when engines or appliances are operated in enclosed areas.</p> <p>Pregnant women may have heightened susceptibility to the effects of exposure to carbon monoxide.</p> <p>Carbon monoxide readily crosses the placenta and can result in the unborn child being starved of oxygen. Data on the effects of exposure to carbon monoxide on pregnant women are limited, but there is evidence of adverse effects on the unborn child. Both the level and duration of maternal exposure are important factors in the effect on the unborn child.</p> <p>There is no indication that breastfed babies suffer adverse effects from their mother's exposure to carbon monoxide, nor that the mother is significantly more sensitive to carbon monoxide after giving birth.</p> <p>Given the extreme risk of exposure to high levels of CO, risk assessment and prevention of high exposure are identical for all workers.</p> <p>Risk assessment may be complicated by active or passive smoking and/or ambient air pollution. If those sources lead to a higher COHb than occupational exposure would, the level of risk is determined by those outside sources, as the effect on COHb is not cumulative.</p> <p>However, careful documentation of such "outside" sources may be required to avoid liability and litigation</p>	<p>The best preventive measure is to eliminate the hazard by changing processes or equipment. Where prevention is not appropriate, technical measures should be considered, in combination with good working practices and personal protective equipment.</p> <p>Chronic exposure of female workers should be avoided. Even occasional exposure to CO could potentially be harmful.</p> <p>Pregnant workers should be informed about the dangers of exposure to carbon monoxide during smoking.</p>	
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<p>Lead and lead derivatives - in so far as these agents are capable of being absorbed by the human organism</p>	<p>Historically, exposure of pregnant women to lead is associated with abortions and miscarriages, but there is no indication that this is still relevant at current accepted standards for exposure. There are strong indications that exposure to lead, both intra-uterine and post-partum, leads to developmental problems, especially of the nervous system and the blood-forming organs. Women, new-born and young children are more sensitive to lead than male adults.</p> <p>Lead is transferred from blood to milk. This may pose a risk to offspring if a woman is highly exposed before and during pregnancy.</p> <p><b>Indications of safe levels</b> Exposure to lead cannot safely be measured in terms of airborne exposure levels, because of the different uptake routes. Biological monitoring of blood lead levels (PbB) and biological effects monitoring (e.g. tests for zinc proto porphyrin and levels of amino laevulinic acid in blood or urine) are the best exposure indicators.</p> <p><b>Risk assessment</b> A risk of exposure of pregnant and breastfeeding women to lead is specifically prohibited under Article 6 of the Directive if the exposure might jeopardise safety or health. The risk assessment should be based upon both the individual's and the work group's historical record of blood lead levels or similar parameters, not on ambient air monitoring. Where these are within the range of unexposed people, it could be concluded that the health is not in jeopardy. However, PbB levels and other biological indicators of exposure may change over time without apparent relation to (airborne) exposure. There is therefore a possibility that a change in the monitoring indicator might occur without an increase in exposure. This could be interpreted as indicating that health had been jeopardised.</p>	<p>Women with reproductive capacity must be subject to a lower blood-lead suspension level than other workers, to protect any developing unborn child.</p> <p>Once their pregnancy is confirmed, women who are subject to medical surveillance under the lead Directive will normally be suspended from work which exposes them significantly to lead.</p> <p>European limit values are in the process of being reviewed.</p> <p>Because the elimination of lead from the body is a very slow process, fertile women should be informed of this. The employer must ensure that exposure to lead is reduced and that women have the option of placement elsewhere until this has been done.</p> <p>In view of this, banning pregnant and breastfeeding women from all lead-containing areas may be the only acceptable option. This is particularly advisable if there is exposure to organic lead compounds.</p>	<p>Council Directive 82/605/EEC (exposure to metallic lead at work) which will be repealed upon transposal by the Member States of Directive 98/24/EC (by 5 May 2001).</p>
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<p>Chemical agents and industrial processes in Annex 1 to Directive 90/394/EEC</p>	<p>Those industrial processes listed in Annex 1 of Directive 90/394/EEC and referred to in Annex 1B of Directive 92/85/EEC may give rise to carcinogenic risk. If there are carcinogens, this should be clearly stated.</p>	<p>Directive 90/394/EEC requires a detailed risk assessment to be carried out.</p> <p>Avoid exposure. If risks cannot be assessed and controlled by collective measures, appropriate steps should be taken to inform and train workers.</p>	<p>Council Directive 90/394/EEC (carcinogens at work)</p>
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