

Carcinogens at work – setting the scene

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EU-OSHA



Facts and figures

- Chemical or biological substances are present in 36 % of workplaces according to EU-OSHA's workplace survey¹
 - Reporting of chemical risks decreases with enterprise size
 - More likely to carry out workplace risk assessments: enterprises reporting chemical or biological risks
 - More likely to carry out a workplace risk assessment: and report chemical or biological risks:
 - enterprises with OSH preventive services, occupational physicians and a health and safety representative
 - enterprises that have access to advice from social partner organisations
 - enterprises visited by labour inspectors
 - In 2014 and 2019, 'use of dangerous substances' was the most frequently covered employee training topic in those enterprises that identified it as a risk.
- 18 % of EU workers report being exposed to chemicals for at least 25 % of their working time²



1)ESENER 2019, Third European Survey of Enterprises on New and Emerging Risks (ESENER 2019): Overview Report How European workplaces manage safety and health <https://osha.europa.eu/sites/default/files/esener-2019-overview-report.pdf>

2) Sixth European Working Conditions Survey, Overview Report, Eurofound, 2016, p. 43. Available at https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1634en.pdf

Cancer and carcinogens

- Cancer the 2nd main cause of death in the EU (26% of all deaths) (2019)
- Lung cancer at the top
- Every year, 2.6 million are diagnosed with cancer and it kills 1.2 million
- Cost € 100 billion
- 4 – 8 % occupational cancer deaths on average, but rates are not the same for all cancers
- European Commission priority
 - Strategic framework for OSH 2021-27 - European Green Deal and EU chemicals strategy for sustainability – update to OELs
 - Prevention of work-related diseases – Beating Cancer Plan
 - Changes to the Carcinogens and Mutagens Directive (2004/37/EC)
 - Need for information on exposure to carcinogens

https://health.ec.europa.eu/non-communicable-diseases/cancer_en

Some figures on cancer at work in Europe

120,000 people/year
develop cancer from
occupational exposure
to carcinogens

53% of work-related
deaths each year
are linked to work-
related cancer

Carcinogen
exposure at work
–
direct cost:
2.4 billion
euro/year

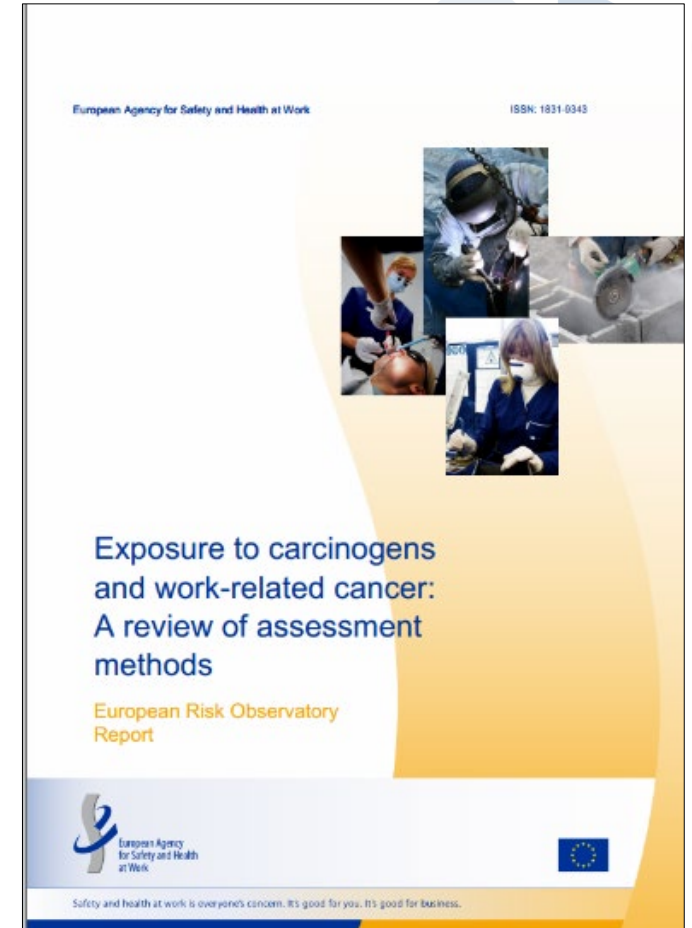
Many of the most relevant carcinogens are process-generated

CAREX study

- Occupational exposure to carcinogens in 15 (subsequently extended to 19) Member States (in 1990–93) (Kauppinen et al., 2000).
- Exposure to carcinogens at work common
- Workers estimated as being exposed in the early 1990s > 30 million, > 23 % of the workforce.
- Most common exposures:
 - UV radiation in sunlight (during regular outdoor work),
 - environmental tobacco smoke (ETS) (in restaurants and other workplaces)
- ETS and UVR about half of all exposures
- Many exposures process-generated! (wood dust, diesel engine exhaust, respirable crystalline silica)
- Follow-up: WOODDEX, TICAREX, Matgéné, FINJEM and CAREX Canada

<https://osha.europa.eu/en/publications/exposure-carcinogens-and-work-related-cancer-review-assessment-methods>

<https://osha.europa.eu/en/publications/summary-exposure-carcinogens-and-work-related-cancer-review-assessment-measures>



Workers often exposed to several carcinogens

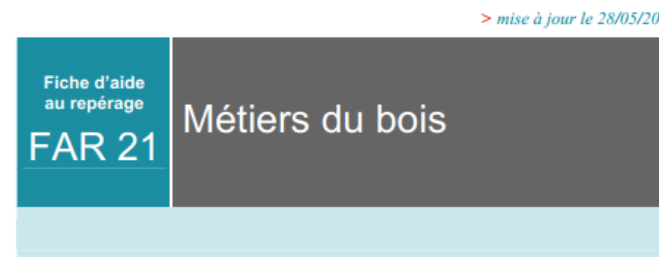
Occupation or industry	Suspected substance(s)	Cancer sites
Mechanics, welders, etc. in motor vehicle manufacturing	PAH, welding fumes, engine exhaust	Lung
Iron and steel foundries and casting	PAHs; silica; metal fumes; formaldehyde	Lung
Boot and shoe manufacture and repair	Leather dust; benzene and other solvents	Leukaemia, paranasal sinuses, bladder
Hairdressers and barbers	Dyes (aromatic amines, amino-phenols with hydrogen peroxide); solvents; propellants; aerosols	Bladder, lung, non-Hodgkin lymphoma, ovary

Source: extracted from *Work-related cancer*, Kuhl and Lißner, OSH wiki article, available at <https://oshwiki.osha.europa.eu/en/themes/work-related-cancer>

Example woodworking

- Depending on the task
- Formaldehyde
- Wood dust
- Solvents
- Polycyclic aromatic hydrocarbons
- Crystalline silica
- Etc
- Guidance and information available in some countries (exampe INRS – fiche d’aide de repérage)

<https://www.inrs.fr/dms/inrs/CataloguePapier/FICHE/TI-FAR-21/FAR21.pdf>



> Cette fiche ne recense que les postes identifiés à risque cancérogène pour l'activité concernée. Chaque établissement mènera sa propre évaluation du risque.

Activités Sources d'émissions (1)	Cancérogènes avérés ou <i>suspectés</i> (2)	Probabilité de présence (3)	Commentaires
Traitement du bois (chimique ou thermique)	Créosotes	Possible	Goudron de houille utilisable uniquement pour le traitement de certains bois au contact du sol (poteaux, traverses de chemins de fer).
	Hydrocarbures aromatiques polycycliques (HAP)	Possible	Dégagement possible lors de la chauffe du bois par l'intermédiaire de brûlots, notamment pour la fabrication de tonneaux (opérations de cintrage ou de bousinage). Lors du chauffage en étuve, il n'y a pas de dégagement de HAP.
	Formaldéhyde	Certaine	Composé naturel du bois émis lors des opérations de traitement thermique.
Décapage de bois peints ou vernis	Trichloroéthylène <i>Dichlorométhane</i>	Possible Possible	Solvants présents dans certains produits de décapage. Se reporter à la FAS 3 pour un avis sur la substitution du dichlorométhane.
	Composants de peintures		Voir la fiche FAR 12 (Fabrication de peintures) pour identifier les cancérogènes susceptibles d'être rencontrés dans les peintures.
	Poussières de bois	Certaine	
	Formaldéhyde	Certaine	Composé pouvant être émis par des bois bruts, des reconstitués, des agglomérés ou des contreplaqués fabriqués à l'aide de résines à base de formaldéhyde

Substances have several effects

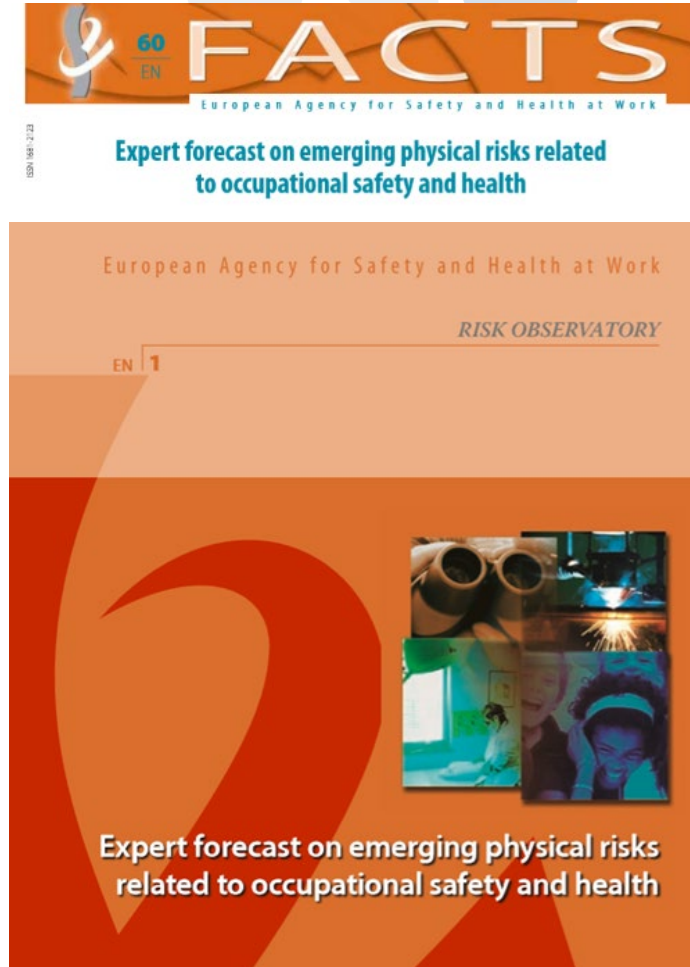
Agent	Cancer	Other potential health effects
Wood dust	Sinonasal and nasopharyngeal cancers	Sensitisation, rhinitis, reduced lung function, skin diseases
Respiratory crystalline silica	Lung cancer	Silicosis
Hydrazine	Lung and colorectal cancer	Irritant, sensitisation, toxic
Chromium (VI) compounds	Lung cancer and sinonasal cancer	Sensitisation, burns, asthmagens, toxic, nasal perforations
Acrylamide	Pancreatic cancer	Suspected reprotoxicant, irritant, sensitising, neurotoxic

Other risks: fire and explosion, skin uptake

Not only chemical risks!

- Research on emerging physical risks
- General increase of exposure to ultraviolet radiation (UVR) identified as an emerging risk
- Many workers may be exposed:
 - Dentists, physiotherapists, lithographers, harbour masters, workers in lighthouses, tailors, tanners, fur dressers, patternmakers, cutters, electrical fitters, wiremen, telephone/telegraph installers/repairmen, glass/pottery/tile workers, rolling mill workers, chimney sweeps, aircraft pilots/navigators and flight engineers, painters, construction workers and farmers, workers in the food industry where UV is used to disinfect food packaging material, workers at machines involving UV to dry dyes and paints (in printing plants) and welders.

<https://osha.europa.eu/en/publications/report-expert-forecast-emerging-physical-risks-related-occupational-safety-and-health>

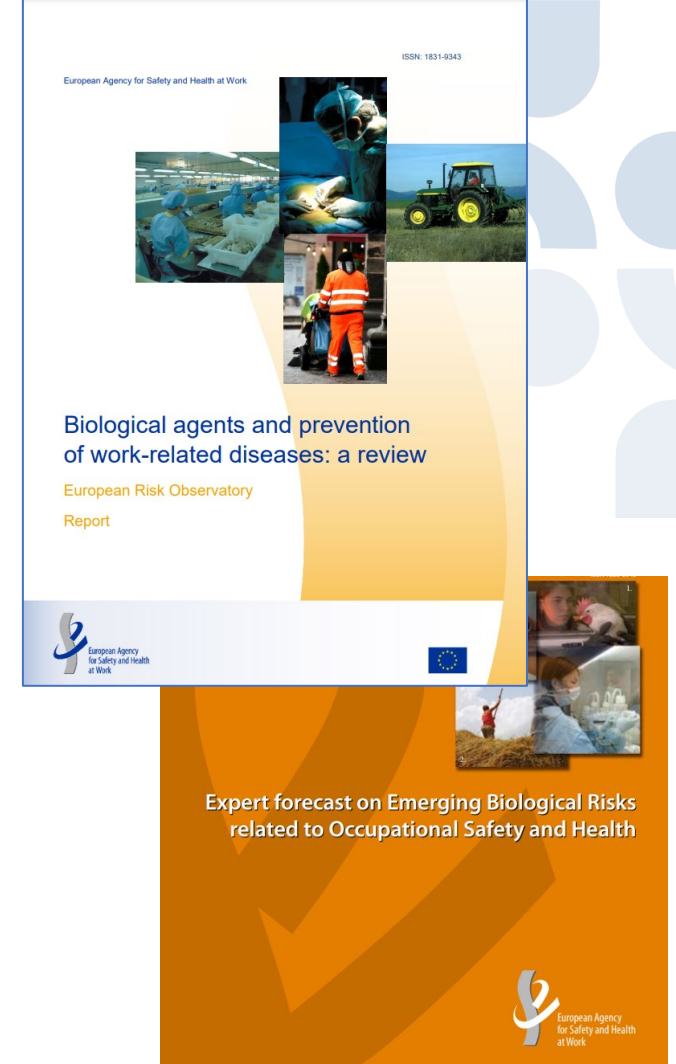


Biological risks

- Exposure to mycotoxins (e.g. aflatoxins, ochratoxin A), and endotoxins of bacterial origin, organic dust
- Hepatitis B and C
- Workers exposed:
 - Activities involving organic materials such as animal feed, food and waste
 - Waste treatment, agriculture, animal breeding, sewage plants, poultry sheds, sawmills and material-recycling facilities, food and feed industry, green construction
 - Health care (needlestick injuries, cuts), cleaners, barbers, manicurists
 - Emergency and aid workers

<https://osha.europa.eu/en/publications/report-expert-forecast-emerging-biological-risks-related-occupational-safety-and-health>

<https://osha.europa.eu/en/publications/review-specific-work-related-diseases-due-biological-agents>



Examples of guidance

- Netherlands: In the agricultural sector, the project "Dust? Deal with it!" ('Pak stof aan') aims at addressing the risks from organic dust
- DE Committee on biological agents (ABAS) – Assessment of the importance of mycotoxins in workplaces – 2007 – provides information on mycotoxins and where they occur
 - ongoing BAuA project to update the assessment

<https://www.stigas.nl/actueel/campagnes/pak-stof-aan/>

<https://www.baua.de/DE/Die-BAuA/Aufgaben/Geschaeftsfuehrung-von-Ausschuessen/ABAS/pdf/Bedeutung-von-Mykotoxinen.html>

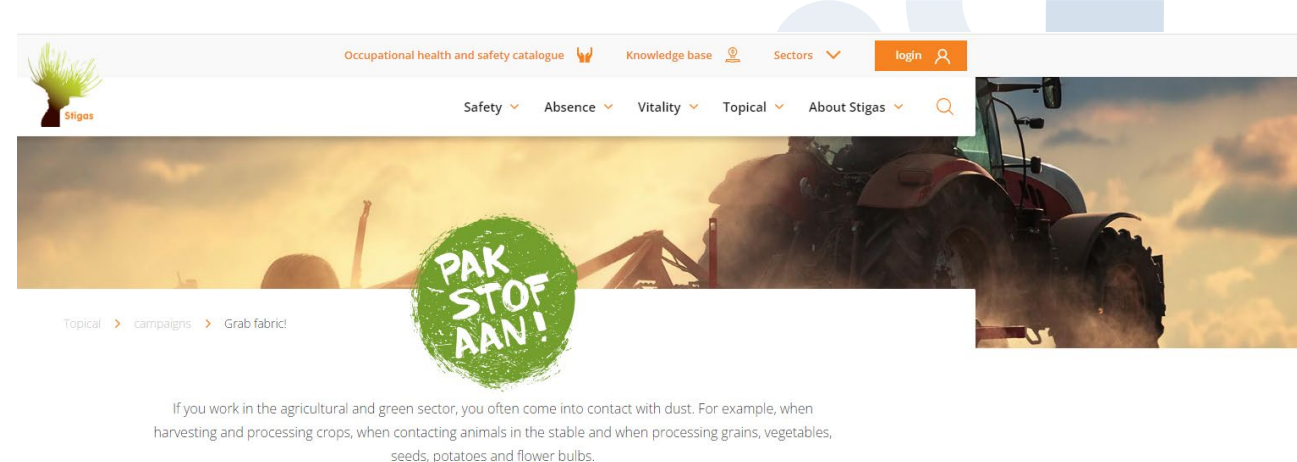


Tabelle 3: Mögliche Wirkungen von Mykotoxinen und zugeordnete Mykotoxinbildner

Wirkung	Verantwortliches Mykotoxin	Relevante Produzenten	Vorkommen	Quelle
Kanzerogen	Aflatoxine (Kat. 1)	<i>A. flavus</i> , <i>A. parasiticus</i>	Nüsse, Gewürze, Getreide Baumwollsamens	IARC, 2002
	Fumonisin B ₁ (Kat. 2B)	Versch. <i>Fusarium</i> arten	Mais	IARC, 2002
	Griseofulvin (Kat. 2B)	<i>P. griseofulvum</i>	Getreide, Futtermittel	IARC 2001
	Ochratoxin A (Kat. 2B)	<i>A. ochraceus</i> , <i>A. carbonarius</i> , <i>P. verrucosum</i>	Getreide, Bier, Kaffee, Nüsse	JECFA, 2001
	Sterigmatocystin (Kat. 2B)	<i>A. versicolor</i> , <i>Emericella nidulans</i> , <i>Chaetomium spp.</i> , <i>A. flavus</i> , <i>A. parasiticus</i>	Käse, Getreide, Hausstaub	IARC, 1976 Engelhart, 2002
Mutagen	<i>Deoxynivalenol</i>	<i>Fusarium spp.</i>	Getreide	JECFA 2001
	OTA	<i>A. ochraceus</i> , <i>A. carbonarius</i> , <i>P. verrucosum</i>	Getreide, Bier, Kaffee, Nüsse	
	T-2, HT-2 Toxin	<i>Fusarium spp.</i>	Getreide	
Frucht-schädigend	<i>Fumonisin B₁</i>	<i>Fusarium spp.</i>	Mais	IPCS 2000
Neurotoxisch	Verrucologen,	<i>A. fumigatus</i>	Holzabfall, Abfall,	Land et al., 1987 Land et al. 1987 Hodge et al, 1988 Frank und Gehrken, 1980
	Fumitremorgen C,	<i>P. aurantiogriseum u.a.</i>	Holzabfall, Obst, Mehl	
	Verrucosidin,	<i>Penicillium verrucosum</i>	Getreide	
	Citreoviridin,	<i>A. terreus</i>	Getreide	

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