La Lista 2010 delle Malattie Professionali dell'International Labour Office e i suoi criteri di diagnosi e prevenzione: *un ruolo inatteso per i Chimici e i Fisici a tutela della salute e del benessere dei Lavoratori*

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Il ruolo dei Chimici e dei Fisici nella tutela della salute

- Da tre anni, ormai, la professione di ***Chimico*** e di ***Fisico*** è stata annoverata tra le ***professioni sanitarie***
- Questo provvedimento legislativo riconosce e formalizza un ruolo in precedenza sottovalutato delle nostre professioni ***nell'ambito della tutela della salute***
- Il nuovo ruolo «fa giustizia» dell'immagine ambigua associata specialmente alla figura del Chimico che opera nell'industria, quale responsabile tacito e consapevole, oppure ignaro e indifferente, dei maggiori fenomeni di ***degrado ambientale e di pericolo per la salute***
- La normativa di ***tutela dai rischi lavorativi*** implicitamente riconosce al Chimico e al Fisico un ruolo nel ***riconoscere i pericoli*** degli agenti nocivi e nel cooperare a ***mitigarne le conseguenze***

L'International Labour Office (ILO)

français français | español español

Advancing social justice, promoting decent work

ILO is a specialized agency of the United Nations

- Costituita nel 1919 tra gli accordi dei *Trattati di Versailles*, è la più longeva delle Organizzazioni Internazionali, dapprima entro la Lega delle Nazioni, successivamente, dal 1946, entro l'Organizzazione delle Nazioni Unite (ONU)
- Da sempre opera nel modo «tripartito», fornendo il foro neutrale e competente per l'incontro e la discussione paritaria tra organizzazioni dei Lavoratori, dei Datori di lavoro e dei Governi nazionali, sui temi dell'equità, della sicurezza e della salute nel lavoro.
- Ad essa aderiscono 187 Stati nel mondo
- Il suo mandato è «***to set labour standards, develop policies and devise programmes promoting decent work for all women and men***»

Il riconoscimento delle malattie professionali e dei loro agenti causali

- ***Fin dalla sua costituzione, ILO ha prodotto Risoluzioni che identificano alcune malattie come di origine professionale e causate da specifici agenti lesivi***

nel 1919
- R.3 **Anthrax** Prevention
- R.4 **Lead Poisoning** (Women and children)

Nel 1925 - C. 18 Workmen's Compensation (occupational diseases)
- Poisoning by **lead**, Poisoning by **mercury**, **Anthrax** infection

Nel 1934 - C. 42 Revised C.18 (10 agenti)
Lead, Mercury, Anthrax, Silicosis, Phosphorus, Arsenic, benzene, halogen derivatives of hydrocarbons of the aliphatic series, radiation, Skin cancer (primary epitheliomatous cancer of the skin)

Una prima razionalizzazione del nesso tra specifica attività lavorativa , agente causale e malatti(e) professionali

Nel 1964 - C. 121 Employment Injury Benefits Convention: il dovere del risarcimento
Schedule I. List of Occupational Diseases
15 malattie (5 nuove: beryllium, chrome, manganese, carbon bisulphide, nitro- and amido-toxic derivatives of benzene & its homologues)

nel 1980 - Schedule I. List Of Occupational Diseases - Amended in 1980: una lista di 29 agenti e malattie
- 15 agenti chimici: Berillio, Cadmio, Fosforo, Cromo, Manganese, Arsenico, Mercurio, Piombo, Fluoro, CS_2, Benzene, Nitro- e Ammino-aromatici, Esteri nitrici, Alcoli, Glicoli e Chetoni, Asfissianti (CO, HCN, H_2S), Metalli Duri, Oli Minerali, Catrami e Peci, Asbesto (Mesotelioma),
- Agenti pneumoconiotici, Polveri vegetali, Polveri Organiche, Agenti sensibilizzanti, Rumore, Vibrazioni, Radiazioni Ionizzanti, Infezioni e Parassiti

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Il riconoscimento delle malattie professionali e dei loro agenti causali

90° Sessione dell'International Labour Conference
Ginevra, Giugno 2002
Committee on Occupational Safety and Health

- **Viene approvata la Raccomandazione n°194**

«*Recommendation concerning the List of Occupational Diseases and the Recording and Notification of Occupational Accidents and Diseases*»

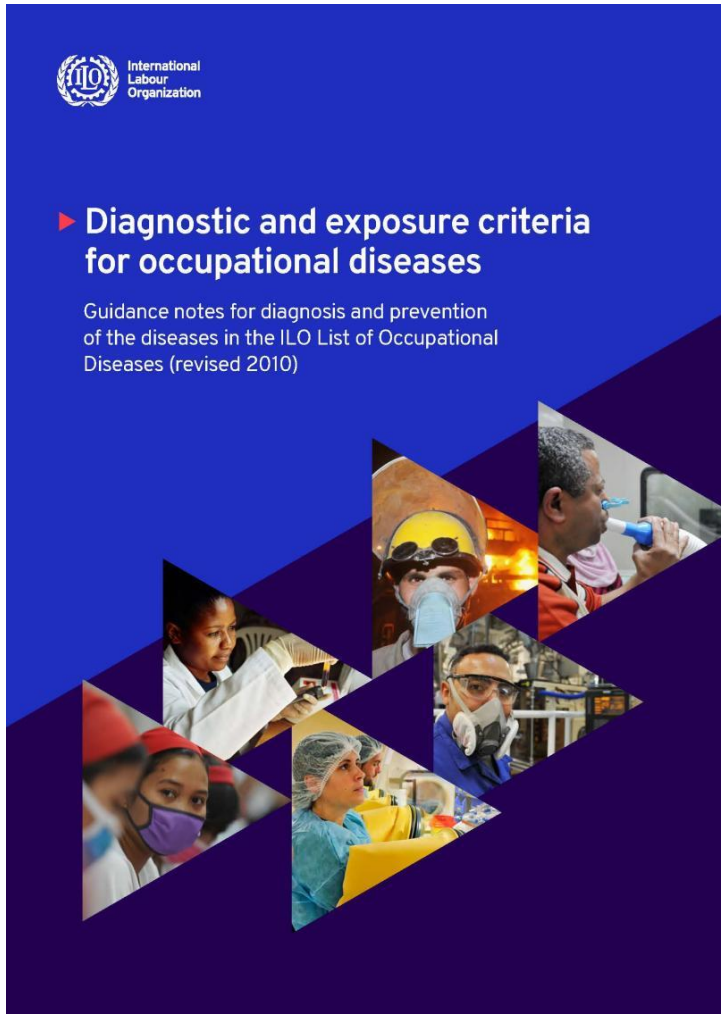
- **Cicli di discussione e trattativa fino al 2010**

«ILO *List of Occupational Diseases (Revised 2010)*»

ANNEX List of occupational diseases (revised 2010)

1. Occupational diseases caused by exposure to agents arising from work activities
   - 1.1. Diseases caused by chemical agents (41)
   - 1.2. Diseases caused by physical agents (7)
   - 1.3. Biological agents and infectious or parasitic diseases (9)
2. Occupational diseases by target organ systems
   - 2.1. Respiratory diseases (12)
   - 2.2. Skin diseases (4)
   - 2.3. Musculoskeletal disorders (8)
   - 2.4. Mental and behavioural disorders (2)
3. Occupational cancer (21)
4. Other diseases (2)

Una lista più ampia, e la richiesta di un «manuale operativo»



- **40 classi di agenti chimici**
  - **18 elementi minerali & loro composti**
  - **8 classi di composti organici**
  - **5 classi di composti inorganici**
  - **5 classi di prodotti chimici industriali**
- **6 classi di agenti fisici**
- **8 agenti biologici, infettivi e parassiti**
- **23 malattie professionali, per organo colpito**
- **20 agenti cancerogeni professionali**

https://www.ilo.org/global/topics/safety-and-health-at-work/resources-library/publications/WCMS_836362
https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---lab_admin/documents/publication/wcms_836362.pdf

Un «manuale operativo» unificato per la diagnosi e la prevenzione

- **Per ciascun agente / malattia una monografia**
- **Informazioni organizzate in modo omogeneo**
  - **Caratteristiche generali dell'agente causale**
  - **Fonti e modalità dell'esposizione professionale**
  - **Breve profilo tossicologico**
    - **Effetti principali sulla salute**
    - **Criteri diagnostici delle malattie professionali causate**
  - **Principali criteri e mezzi di prevenzione**
  - **Bibliografia essenziale**
  - **Tabelle riassuntive**

https://www.ilo.org/global/topics/safety-and-health-at-work/resources-library/publications/WCMS_836362

https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---lab_admin/documents/publication/wcms_836362.pdf

ANNEX

List of occupational diseases [1]
(revised 2010)

1. Occupational diseases caused by exposure to agents arising from work activities

1.1. Diseases caused by chemical agents

1.1.1. Diseases caused by beryllium or its compounds
1.1.2. Diseases caused by cadmium or its compounds
1.1.3. Diseases caused by phosphorus or its compounds
1.1.4. Diseases caused by chromium or its compounds
1.1.5. Diseases caused by manganese or its compounds
1.1.6. Diseases caused by arsenic or its compounds
1.1.7. Diseases caused by mercury or its compounds
1.1.8. Diseases caused by lead or its compounds
1.1.9. Diseases caused by fluorine or its compounds
1.1.10. Diseases caused by carbon disulfide
1.1.11. Diseases caused by halogen derivatives of aliphatic or aromatic hydrocarbons
1.1.12. Diseases caused by benzene or its homologues
1.1.13. Diseases caused by nitro- and amino-derivatives of benzene or its homologues
1.1.14. Diseases caused by nitroglycerine or other nitric acid esters
1.1.15. Diseases caused by alcohols, glycols or ketones
1.1.16. Diseases caused by asphyxiants like carbon monoxide, hydrogen sulfide, hydrogen cyanide or its derivatives
1.1.17. Diseases caused by acrylonitrile
1.1.18. Diseases caused by oxides of nitrogen
1.1.19. Diseases caused by vanadium or its compounds
1.1.20. Diseases caused by antimony or its compounds
1.1.21. Diseases caused by hexane
1.1.22. Diseases caused by mineral acids
1.1.23. Diseases caused by pharmaceutical agents
1.1.24. Diseases caused by nickel or its compounds
1.1.25. Diseases caused by thallium or its compounds
1.1.26. Diseases caused by osmium or its compounds
1.1.27. Diseases caused by selenium or its compounds
1.1.28. Diseases caused by copper or its compounds
1.1.29. Diseases caused by platinum or its compounds
1.1.30. Diseases caused by tin or its compounds
1.1.31. Diseases caused by zinc or its compounds
1.1.32. Diseases caused by phosgene
1.1.33. Diseases caused by corneal irritants like benzoquinone
1.1.34. Diseases caused by ammonia
1.1.35. Diseases caused by isocyanates
1.1.36. Diseases caused by pesticides

[1] In the application of this list the degree and type of exposure and the work or occupation involving a particular risk of exposure should be taken into account when appropriate.

1.1.37. Diseases caused by sulphur oxides
1.1.38. Diseases caused by organic solvents
1.1.39. Diseases caused by latex or latex-containing products
1.1.40. Diseases caused by chlorine
1.1.41. Diseases caused by other chemical agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these chemical agents arising from work activities and the disease(s) contracted by the worker

1.2. Diseases caused by physical agents

1.2.1. Hearing impairment caused by noise
1.2.2. Diseases caused by vibration (disorders of muscles, tendons, bones, joints, peripheral blood vessels or peripheral nerves)
1.2.3. Diseases caused by compressed or decompressed air
1.2.4. Diseases caused by ionizing radiations
1.2.5. Diseases caused by optical (ultraviolet, visible light, infrared) radiations including laser
1.2.6. Diseases caused by exposure to extreme temperatures
1.2.7. Diseases caused by other physical agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these physical agents arising from work activities and the disease(s) contracted by the worker

1.3. Biological agents and infectious or parasitic diseases

1.3.1. Brucellosis
1.3.2. Hepatitis viruses
1.3.3. Human immunodeficiency virus (HIV)
1.3.4. Tetanus
1.3.5. Tuberculosis
1.3.6. Toxic or inflammatory syndromes associated with bacterial or fungal contaminants
1.3.7. Anthrax
1.3.8. Leptospirosis
1.3.9. Diseases caused by other biological agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these biological agents arising from work activities and the disease(s) contracted by the worker

2. Occupational diseases by target organ systems

2.1. Respiratory diseases

2.1.1. Pneumoconioses caused by fibrogenic mineral dust (silicosis, anthraco-silicosis, asbestosis)
2.1.2. Silicotuberculosis
2.1.3. Pneumoconioses caused by non-fibrogenic mineral dust
2.1.4. Siderosis
2.1.5. Bronchopulmonary diseases caused by hard-metal dust
2.1.6. Bronchopulmonary diseases caused by dust of cotton (byssinosis), flax, hemp, sisal or sugar cane (bagassosis)

2.1.7. Asthma caused by recognized sensitizing agents or irritants inherent to the work process

2.1.8. Extrinsic allergic alveolitis caused by the inhalation of organic dusts or microbially contaminated aerosols, arising from work activities

2.1.9. Chronic obstructive pulmonary diseases caused by inhalation of coal dust, dust from stone quarries, wood dust, dust from cereals and agricultural work, dust in animal stables, dust from textiles, and paper dust, arising from work activities

2.1.10. Diseases of the lung caused by aluminium

2.1.11. Upper airways disorders caused by recognized sensitizing agents or irritants inherent to the work process

2.1.12. Other respiratory diseases not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the disease(s) contracted by the worker

2.2. Skin diseases

2.2.1. Allergic contact dermatoses and contact urticaria caused by other recognized allergy-provoking agents arising from work activities not included in other items

2.2.2. Irritant contact dermatoses caused by other recognized irritant agents arising from work activities not included in other items

2.2.3. Vitiligo caused by other recognized agents arising from work activities not included in other items

2.2.4. Other skin diseases caused by physical, chemical or biological agents at work not included under other items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the skin disease(s) contracted by the worker

2.3. Musculoskeletal disorders

2.3.1. Radial styloid tenosynovitis due to repetitive movements, forceful exertions and extreme postures of the wrist

2.3.2. Chronic tenosynovitis of hand and wrist due to repetitive movements, forceful exertions and extreme postures of the wrist

2.3.3. Olecranon bursitis due to prolonged pressure of the elbow region

2.3.4. Prepatellar bursitis due to prolonged stay in kneeling position

2.3.5. Epicondylitis due to repetitive forceful work

2.3.6. Meniscus lesions following extended periods of work in a kneeling or squatting position

2.3.7. Carpal tunnel syndrome due to extended periods of repetitive forceful work, work involving vibration, extreme postures of the wrist, or a combination of the three

2.3.8. Other musculoskeletal disorders not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the musculoskeletal disorder(s) contracted by the worker

2.4. Mental and behavioural disorders

2.4.1. Post-traumatic stress disorder

2.4.2. Other mental or behavioural disorders not mentioned in the preceding item where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to risk factors arising from work activities and the mental and behavioural disorder(s) contracted by the worker

3. Occupational cancer

3.1. Cancer caused by the following agents

3.1.1. Asbestos

3.1.2. Benzidine and its salts

3.1.3. Bis-chloromethyl ether (BCME)

3.1.4. Chromium VI compounds

3.1.5. Coal tars, coal tar pitches or soots

3.1.6. Beta-naphthylamine

3.1.7. Vinyl chloride

3.1.8. Benzene

3.1.9. Toxic nitro- and amino-derivatives of benzene or its homologues

3.1.10. Ionizing radiations

3.1.11. Tar, pitch, bitumen, mineral oil, anthracene, or the compounds, products or residues of these substances

3.1.12. Coke oven emissions

3.1.13. Nickel compounds

3.1.14. Wood dust

3.1.15. Arsenic and its compounds

3.1.16. Beryllium and its compounds

3.1.17. Cadmium and its compounds

3.1.18. Erionite

3.1.19. Ethylene oxide

3.1.20. Hepatitis B virus (HBV) and hepatitis C virus (HCV)

3.1.21. Cancers caused by other agents at work not mentioned in the preceding items where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure to these agents arising from work activities and the cancer(s) contracted by the worker

4. Other diseases

4.1. Miners' nystagmus

4.2. Other specific diseases caused by occupations or processes not mentioned in this list where a direct link is established scientifically, or determined by methods appropriate to national conditions and practice, between the exposure arising from work activities and the disease(s) contracted by the worker

La monografia di una classe diffusa di inquinanti chimici (1)

1.1.18 Diseases caused by oxides of nitrogen or its compounds	ICD Code T59.0 + Z57
General characteristics of the causal agent	Nitrogen oxides (NO_x) (or nitric oxides) are the binary compounds of nitrogen and oxygen, which are mainly formed at high temperature and pressure levels or under the action of electric sparks. Nitrogen oxide (NO) and nitrogen dioxide (NO_2) are airborne contaminants, which give rise to acidic compounds (nitrous and nitric acid) when dissolved in water. Nitric acid is formed in ambient air from nitrogen oxides, which are released as a by-product of fuel combustion, mainly in car engines, with other minor sources being the combustion of fossil fuels for power generation and biomass burning. Natural sources of nitrogen oxides with strong relevance in atmospheric chemistry and climate control are high-voltage electrical sparks in the atmosphere, such as lightning. *Nitric oxide* (NO, also known as nitrogen oxide, CAS number 10102-43-9, molecular mass 30.01) is a colourless and odourless gas with a density similar to air. It is quickly oxidized to brown nitrogen dioxide by air and other combustible and reducing materials.
Occupational exposures	Nitrogen oxides are released from the exhaust of motor vehicles, the burning of coal, oil, or natural gas, and during arc welding, electroplating, engraving, and dynamite blasting. Nitrogen oxides are intermediates in the production of nitric acid and are sometimes employed as chemical reagents in the synthesis of fine chemicals and in the nitration of organic compounds, especially in the manufacturing of civil explosives, rocket fuels, and military ordnance. Fumes of nitrogen oxides are generated in fires in the low-temperature aging of nitrate-containing materials, such as fertilizers (ammonium nitrate) and aged ammunition. *Nitric oxide* is produced by high-temperature catalysed reaction of oxygen-nitrogen mixtures, and is employed in situ to produce ammonia and nitric acid, which are major chemical commodities.

Definizioni «legalmente cogenti» della realtà naturale

Competenze multiple del mondo tecnologico

La monografia di una classe diffusa di inquinanti chimici (2)

Toxicological profile, main health effects and diagnostic criteria

Short toxicological profile	Nitrogen oxides exert their action on human health mainly by means of their irritant and corrosive power and through their effect on the structures of the respiratory, central nervous, and haemopoietic systems. NO_2 is thought to damage lungs through its conversion to nitric and nitrous acids in the distal airways, which directly damage lung cells with functional and structural roles. It can initiate the generation of free radicals that eventually lead to damage of cell membranes, protein oxidation, and lipid peroxidation. Finally, alteration of macrophage and immune function by NO_2 reduces resistance to infections. Damage to the lower structures of the respiratory tract can lead to scarring of the bronchioles, which is the pathological basis for life-threatening episodes that may occur even several weeks following exposure to nitrogen gases.

Name of the diseases and ICD code: **Acute diseases caused by oxides of nitrogen**
(Specific disease code) **+T59.0 +Z57**

Mucous membrane irritation (J68), Bronchitis and pneumonitis (J68.0), Pulmonary oedema (J68.1), Upper respiratory inflammation (J68.2), Reactive airways dysfunction syndrome (RADS) (J68.3), Irritant-induced acute occupational asthma (J68.3), Acute irritant contact dermatitis (L24), Burns and corrosions of external body surface (T20-T25), Burns and corrosions of eye and adnexa (T26.0-T26.1, T26.5-T26.6), Conjunctivitis (H10.2), Corneal ulcer (H16.0), Blindness (H16.1)

Short description of the disease

Inhalation exposure to high concentrations of nitrogen oxides can irritate eyes, nose, throat, and lungs, causing cough and shortness of breath, tiredness, and nausea. Exposure to higher levels can cause rapid burning, spasms,

Diagnostic criteria

Clinical manifestations

- Signs and symptoms:
  - Immediate response to nitrogen oxides and their compounds may include coughing, rhinitis, fatigue,

Il contributo interdisciplinare alla comprensione dei fenomeni

Le codifiche internazionali delle malattie: ICD-10 e ICD-11

Il ruolo specifico della Medicina clinica del Lavoro

La monografia di una classe diffusa di inquinanti chimici (3)

Key actions for prevention	Indoor exposure to nitrogen oxides can be minimized by increasing ventilation, avoiding or limiting tobacco smoke and switching from combustion to electric heating and cooking appliances. Nitrogen oxides adversely affect children, pregnant workers, and the elderly because of the greater susceptibility of these subjects due to phases of development or underlying vulnerable health conditions. In several countries, gasoline engines are obligatorily fitted with catalytic converters, which reduce nitrogen oxides. Stationary plants that emit NO_x are equipped with "de-NO_x" units that reduce nitrogen oxides in combustion exhausts to elemental nitrogen gas by reaction with gaseous ammonia or with urea. To minimize exposure of surgical staff and other healthcare workers to nitrous oxide, improved devices with exhaust of exhaled air are used in hospitals, as well as alternative anaesthetic pharmaceuticals and procedures.
	The group of experts considered that the following limits of exposure of workplace atmospheric concentrations have been observed to provide a reasonable level of protection for workers' health and to be used in a number of countries: • Nitric oxide: 25 ppm as 8hr TWA. • Nitrogen dioxide: 0.2 ppm as 8hr TWA. • Nitrous oxide: 50 ppm as 8hr TWA.

Further reading

1. International programme on chemical safety. Environmental health criteria 4. Oxides of nitrogen (1977). Available at: http://www.inchem.org/documents/ehc/ehc/ehc004.htm. Last accessed: October 2021.

For the chemical entities listed below an entry exists in the collection of International Chemical Safety Cards (ICSC) hosted in the ILO website

Name	Synonyms	ICSC
Nitric oxide	Nitrogen oxide, Mononitrogen monoxide (cylinder)	1311

▶ **Table of diseases and risk factors with ICD-10 and ICD-11 codes**

ILO	Disease name	ICD-10	ICD-11
1.1.18	Acute/chronic diseases caused by oxides of nitrogen	T59.0	NE61& XM69M3

Coordinare i ruoli specifici dei tecnologi

Il ruolo specifico del Chimico analista

Organizzare e coordinare le informazioni

Grazie dell'attenzione!

- ***Alcune versioni, tradotte nelle principali lingue nazionali, sono già in corso di redazione***