

COMMENT

Open Access



Banned here, sold elsewhere: globalization, e-commerce and the continuing circulation of asbestos-containing products

Alessandro Francesco Gualtieri^{1*} and Alessandro Cavallo²

Abstract

Despite widespread recognition of its carcinogenicity and bans in many countries, asbestos remains a persistent global public health challenge. Regulatory fragmentation, transnational trade, and the rapid expansion of digital marketplaces continue to facilitate the circulation of asbestos-containing materials (ACM) across national borders. While all forms of asbestos, including chrysotile are prohibited in several jurisdictions, chrysotile is still mined, manufactured, and extensively used in major economies, including Russia and China, and remains incorporated into construction materials throughout large parts of Asia, the Middle East, and other regions. This regulatory asymmetry undermines national bans and compromises efforts to achieve zero exposure. In this Comment, we examine the consequences of the absence of a global asbestos ban and the continued failure to include chrysotile in Annex III of the Rotterdam Convention. We discuss how these regulatory gaps contribute to unrecognized exposure among the general population, create legal and economic liabilities for industries, and exacerbate environmental health risks in conflict zones and during large-scale construction and demolition activities. To illustrate the practical implications of these shortcomings, we present a case study demonstrating the ease with which asbestos-containing consumer products can be purchased through international e-commerce platforms. Laboratory analyses confirmed the presence of regulated chrysotile fibres in heat-resistant gloves purchased online, highlighting substantial deficiencies in product disclosure, regulatory enforcement, and cross-border accountability. This finding demonstrates how digital trade can bypass existing regulatory safeguards and expose unsuspecting consumers to carcinogenic materials. Asbestos should no longer be viewed as a legacy hazard but as an evolving global risk sustained by economic globalization, regulatory inconsistency, and technological change. Addressing this challenge will require coordinated international action, greater supply-chain transparency, and regulatory frameworks capable of responding to the realities of twenty-first century commerce.

Clinical trial number

Not applicable.

Keywords Asbestos, Chrysotile, Rotterdam, EU, Exposure, Population

*Correspondence:

Alessandro Francesco Gualtieri
alessandro.gualtieri@unimore.it

¹Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia, Via G. Campi 103, I-41125 Modena, Italy

²Department of Earth and Environmental Sciences, University of Milan-Bicocca, Piazza della Scienza, 4, I-20126 Milano, Italy



© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Background

Asbestos is a natural material with a peculiar fibrous or asbestiform shape which grants it an outstanding set of chemical-physical-technological properties that has been widely exploited throughout human history [15]. There are six minerals classified as asbestos, five of them are amphibole species (asbestos actinolite, amosite, asbestos anthophyllite, crocidolite and asbestos tremolite) and one is a serpentine species, chrysotile [15].

Albeit the extremely versatile industrial applications, asbestos represents today a serious occupational and environmental issue. Supported by a strong body of evidence, all six forms of asbestos have been evaluated as “carcinogenic to humans” (Group 1) by the International Agency for Research on Cancer IARC [8]. Despite the IARC classification of all asbestos forms as Group 1 carcinogens, chrysotile remains subject to ongoing political and regulatory controversy in some countries [2]. This controversial “pro-chrysotile” position led to the global ban of the amphibole asbestos species and only to a partial global ban of chrysotile. In fact, only 74 countries over 195 (ca. 38%) today have banned all asbestos species, including chrysotile [9] while the other countries (62%) still allow the so-called “safe or controlled” use of chrysotile, authorizing its controlled manipulation as long as precautionary measures are in place [3]. Moreover, it should be remarked that in some countries, asbestos regulation remains subject to conflicts between national and regional authorities. Brazil is a notable example, where federal legislation historically permitted the controlled use of chrysotile asbestos, while several states enacted complete bans based on public health concerns [9].

This apparent asymmetry gave rise to a “global chrysotile issue”. The list of “pro-(safe-use-)chrysotile” countries includes Russia, China, India, and Kazakhstan. These countries still produce (and consume) chrysotile-containing products.

Hence, a paradoxical situation arises today. On the one hand, there are old European multinationals that produced cement in the past, such as the *Eternit* corporate. They have gradually replaced asbestos in the industrial process with fibres of biological origin (e.g. cellulose) and are still facing civil and criminal trials for manslaughter and environmental disaster. The well-known *Eternit* maxi-trials regarded thousands of victims of occupational disease and corporate executives around the world. They were held in Italy and opposed thousands of plaintiffs to the former managers and owners of four asbestos manufacturing plants in Italy. On the other hand, there are other multinational companies that inherited the knowledge and recipes for cement-asbestos products and often maintained ties with the old European parent company *Eternit*, at least in terms of name (see for example, SAMA, former *Eternit* S.A., in Brazil, and *Dadex Eternit*

Limited in Pakistan), still producing cement-asbestos with chrysotile and exporting it.

Because in most of the countries worldwide chrysotile is not banned, used in a “controlled” way (even though there are many doubts that could be raised about the application of “controlled use” in real-world cases) and actually represents an economic resource, it is not surprising that chrysotile remains unlisted in Annex III of the Rotterdam Convention [10], despite repeated recommendations by the Convention’s Chemical Review Committee. Consequently, chrysotile is not subject to the Prior Informed Consent (PIC) procedure, unlike all other amphibole asbestos varieties [11]. If included in Annex III, international trade in chrysotile would be governed by mandatory information exchange, requiring exporting countries to notify importing parties of the associated health and environmental risks and to respect the import decisions communicated by those parties. Such listing would not constitute a global ban, but would enhance transparency, strengthen national decision-making, and reduce involuntary exposure by ensuring that importing countries explicitly consent to trade. At the most recent Conference of the Parties, COP12, in April–May 2025, consensus on listing could not be reached and consideration was deferred to COP13. The continued impasse reflects political opposition by a small group of parties, facilitated by the Treaty’s consensus-based listing practice, and persists despite ongoing discussions on procedural reform [9].

The European Union (EU) continues to strengthen its regulatory framework governing ACM, although additional measures to address remaining regulatory gaps and improve implementation are still under development [7]. The CLP Regulation EC No 1272 [4] classifies asbestos as carcinogenic substance, identified with the EINECS number 650-013-00-6, and with codes H350 (may cause cancer) and H372 (damages organs through exposure). It imposes specific labelling and secure packaging for transport. The updated EU Regulation 2865 (2024) of the European Parliament and of the Council of October 23rd, 2024 on classification, labelling and packaging of substances and mixtures in Article 48a Distance sales offers says: “When substances or mixtures are placed on the market through distance sales, the offer shall clearly and visibly indicate the label elements referred to in Article 17”. Article 17 of the CLP Regulation establishes the mandatory minimum requirements for the labelling of hazardous substances and mixtures, ensuring the communication of hazard. The label must be in the local language, clearly legible, and include product identifiers, supplier details, pictograms, warnings, hazard statements (H), precautionary statements (P), and supplementary information. Unfortunately, European Council postponed to January 1st, 2028 the date of entry

into application of many provisions in the regulation on classification, labelling, and packaging of chemicals [4].

To make the situation even more confused, individual states of the EU decided to find and apply independent solutions. In Italy for example, the Italian Consumer Code, released as Italian Legislative Decree 206, 2005, prohibits, at national level, the sale of products that do not comply with safety standards, lack labelling in Italian, or do not bear the mandatory information (product name, manufacturer, materials). Breach of these requirements results in administrative fines. Article 11 prohibits the sale, within the national territory, of any product or product packaging that does not clearly and legibly display the information required by Articles 6, 7, and 9; in particular, Article 6, point d) refers to the possible presence of materials or substances that may cause harm to humans, property, or the environment.

The consequences of unregulated trade of ACM

The absence of a globally harmonized ban on chrysotile has prevented its inclusion in Annex III of the Rotterdam Convention, thereby allowing chrysotile-containing materials to be traded and distributed worldwide without mandatory warning labels. This situation generates concern, issues and international legal actions.

In principle, the lack of warning labelling for chrysotile-containing materials means that any purchaser would be unaware of the contents of the product. Hence, short-circuits may be frequent. For example, a chrysotile-containing material produced in a country where “controlled” use of chrysotile is authorized, can be exported to a country where instead the import and use of all forms of asbestos, including chrysotile, is banned.

The first consequence of chrysotile not being globally banned and included in Annex III of the Rotterdam Convention is that countries where it is banned are unable to control its possible import and may unwittingly find with products containing asbestos on their territory. This situation jeopardises the ambitious goal of the countries that have banned all the asbestos regulated species to achieve zero domestic asbestos and zero risk of exposure for the population.

A second consequence is the risk of possible environmental (not professional) exposure for people of all ages. The EU itself admits that “articles and mixtures containing these fibres added intentionally are prohibited in the EU but this may not always prevent materials containing asbestos from entering the EU via manufactured goods from overseas, where local regulations may not be as stringent” [5]. While chrysotile-containing materials are handled “safely” (controlled) in the country of production, especially in the professional environments where personal protective equipment is worn, this is not the case in countries that unknowingly receive

products containing chrysotile. If there is no awareness of the presence of chrysotile (and possibly other forms of amphibole), users, especially the general population, in both indoor and outdoor environments, do not take precautions and may come into contact with asbestos fibres without any protection. As an example, we mention the recent high-profile case involved the discovery of asbestos in children’s play sand sold in UK where children’s play sand has been withdrawn from shelves by a craft retailer after a parent discovered they were contaminated with asbestos (article published on the Guardian by Anna Tims on January 24, 2026 [14]).

A third consequence is the risk of unaware exposure in the work environment (a form of professional exposure), with severe health effects consequent from unknown exposure to chrysotile in the material being used as the lack of information precludes the adoption of precautionary actions and of health surveillance. This is a real risk for companies that unknowingly use or import materials or raw materials containing asbestos for their production. Moreover, in countries like Italy, if a company unknowingly uses or imports a material containing asbestos and this material is discovered and reported, the legal consequences can be harsh. In fact, the Individual companies can suffer from economic losses and legal issues if the presence of asbestos is discovered by the local environmental/health authorities. For these reasons, even though they are not required, routine control analyses aimed at detecting the presence of asbestos are carried out in certain industrial sectors, such as the ceramics industry in Italy. If asbestos contamination is detected in imported natural raw materials, the company immediately takes all necessary measures to suspend the use, even preventive, of that raw material and its importation. In the past, there have been cases of contamination of asbestos in natural raw materials imported into the Italian ceramic sector for the production of ceramic tiles (see for example, [6]).

A fourth consequence concerns the difficulty of ensuring that the working conditions of EU citizens deployed abroad comply with EU and Member State occupational health legislation. These regulatory gaps may leave workers without the level of protection guaranteed within the EU, particularly when they are deployed to countries where asbestos remains in use. War journalists, military personnel, and NGO and health operators from countries with comprehensive asbestos bans represent an extreme case of vulnerable occupational groups [12] as in conflict zones, the destruction of buildings containing asbestos can release airborne asbestos fibres, resulting in potentially substantial exposures for both civilian populations and deployed personnel.

The digital extension of an unregulated market: buying ACM online

While the inclusion of chrysotile within the framework of the Rotterdam Convention represents an important step toward greater oversight of international trade, it does not address a more recent and distinct challenge: the online distribution of regulated substances such as ACM (and unfortunately many others like agricultural products).

It is known that digital commerce can circumvent national and EU restrictions on regulated and/or hazardous chemicals, including asbestos [1], highlighting the need for stronger international controls to enhance consumer protection. However, this issue is not unique to chrysotile but represents a broader challenge for the regulation of hazardous chemicals in digital marketplaces.

The continued lack of comprehensive global regulation has enabled the emergence of digital marketplaces as alternative channels through which ACM can be marketed and purchased across borders, often beyond the scope of traditional trade-control mechanisms. As a result, online ACM sales constitute an additional and largely overlooked consequence of the unregulated global circulation of asbestos. This development raises serious public health and regulatory concerns, as the online sale of asbestos-containing goods may occur across borders, exploiting inconsistencies in national legislation and weaknesses in enforcement mechanisms.

In December 2025, the authors of this paper directly experienced that it is possible to purchase products containing asbestos online. In fact, in November 2025, a private citizen reported the possibility of purchasing white “heat-resistant oven gloves for indoor and outdoor use” online from one of the top five most influential global e-commerce retailers and asked whether the product in question could contain asbestos. The product is advertised online.

In December 2025, the authors decided to buy the item from the same retailer (for the prize of about 14 euros) and analyse it to assess the presence of asbestos. The purchases were made independently, two weeks apart. In both cases, the purchases were successful and the item was delivered in a few days.

The manufacturer information reported that the product was “Made in China”. The presence of asbestos is not declared nor CE marking. For obvious reasons of privacy and to avoid any legal action, the retailer’s name is not disclosed here. However, the samples analysed and the product traceability data are kept on file at the Department of Chemical and Geological Sciences of the University of Modena and Reggio Emilia (Modena, Italy).

The purpose of this investigation was to confirm that it is still possible today to purchase a product containing asbestos online; therefore, it is intended solely as a



Fig. 1 The “heat-resistant oven gloves for indoor and outdoor use” bought online from one of the world’s largest online retailer

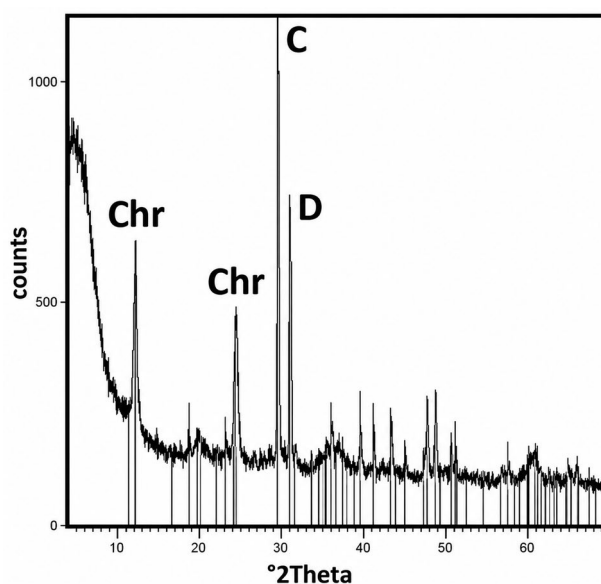


Fig. 2 The X-ray powder pattern of the gloves showing they are composed of a mix of chrysotile (Chr), calcite (C) and dolomite (D)

case-study report and does not claim to be a systematic and comprehensive research.

Figure 1 shows the “heat-resistant oven gloves for indoor and outdoor use” bought online.

Fragments were removed from both gloves using laboratory tweezers and analysed with X-ray powder diffraction and scanning electron microscopy (SEM) equipped with X-ray microanalysis EDS. It should be noted that, when handled, the gloves regrettably tended to release dust. The analyses of the fragments of the pair of gloves revealed that they were composed of fibre bundles of chrysotile (serpentine asbestos with ideal composition $\text{Mg}_3(\text{OH})_4\text{Si}_2\text{O}_5$). Figure 2 shows the X-ray powder pattern of the sample fragments with the main reflections of

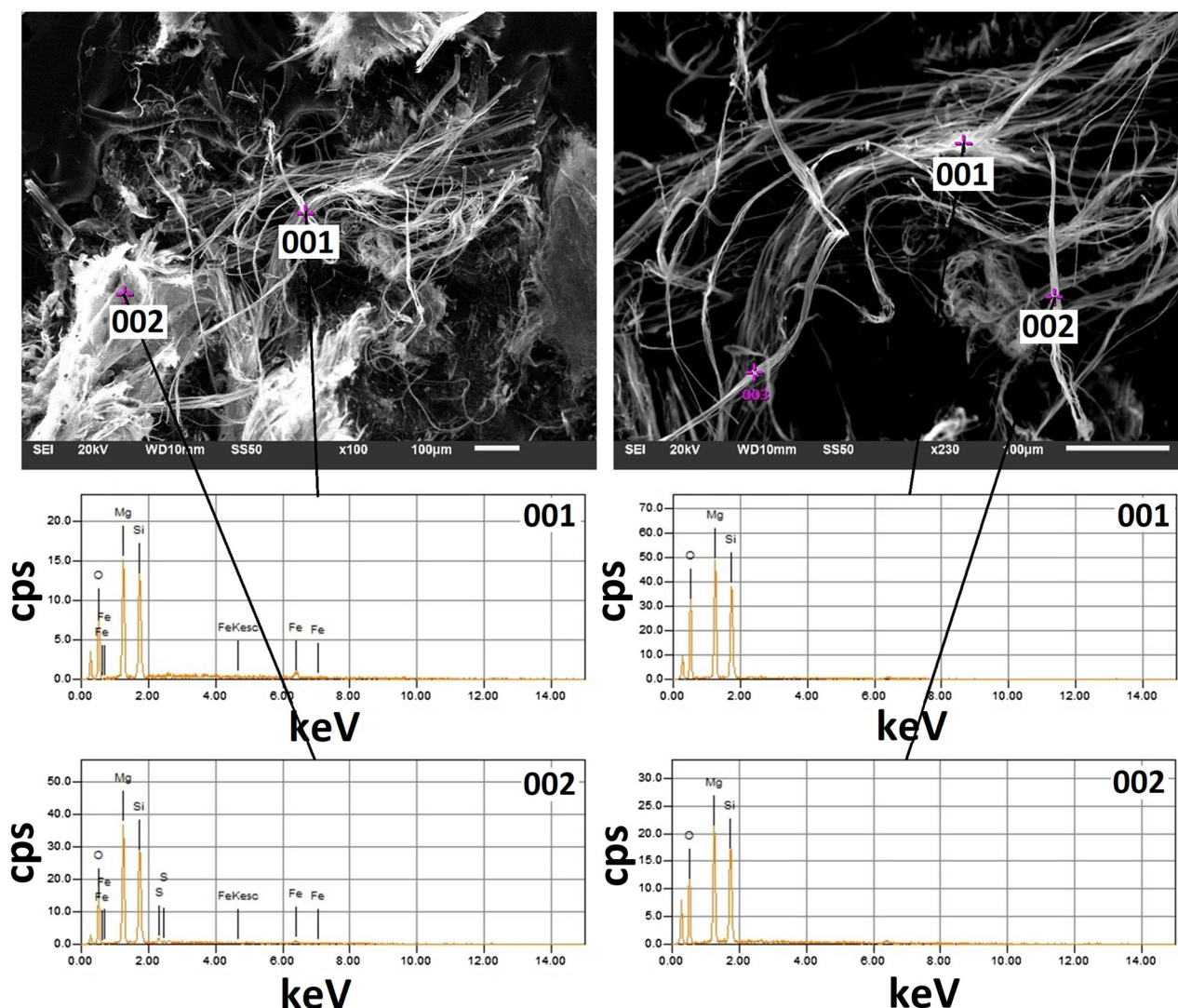


Fig. 3 SEM-EDS of the fragments from the left and right gloves, showing that they are both composed mostly of chrysotile fibre bundles, with the characteristic elements Si, Mg, and O of chrysotile, with ideal composition $\text{Mg}_3(\text{OH})_4\text{Si}_2\text{O}_5$

chrysotile (Chr), calcite (C) and dolomite (D). Estimated content of chrysotile from the diffraction peak areas was 89.0(5.0) wt%.

Figure 3 reports the results of the SEM-EDS analyses of the fragments from the left and right gloves, confirming that they are composed of chrysotile fibre bundles. The analysis of the morphology of the fibres also revealed that they are regulated and hence, respirable, with length $L \geq 5 \mu\text{m}$ long, width $W < 3 \mu\text{m}$, and aspect ratio $L: D \geq 3:1$ [16].

Our findings suggest that the product do not comply with asbestos regulations currently applicable in Italy and the case should be reported to the competent authorities.

Unlike traditional supply chains, digital platforms obscure responsibility, dilute accountability, and complicate regulatory intervention. As a result, consumers, often unaware of the presence of asbestos, may

be exposed to such hazardous substances. The case described in this commentary may be just the tip of the iceberg and could potentially be a massive global problem. There are signs of this, as other similar cases have been recently reported. Foremost is the recent high-profile discovery of asbestos in children's play sand sold in UK where children's play sand has been withdrawn from shelves by a craft retailer after a parent discovered they were contaminated with asbestos [13, 14].

Examining this phenomenon is essential for understanding how digital markets can undermine hard-won regulatory achievements and for identifying the urgent need for harmonized international responses.

Conclusions

In the absence of a global ban for all asbestos regulated species, which currently appears unlikely in the foreseeable future, the inclusion of chrysotile asbestos in Annex III of the Rotterdam Convention remains the most important available measure to improve transparency and oversight in the international trade of ACM. Such inclusion would strengthen information-sharing obligations and require clearer identification of chrysotile-containing products moving through international markets.

However, the findings of this study suggest that the online distribution of ACM represents a distinct and emerging challenge that cannot be fully addressed through the mechanisms of the Rotterdam Convention alone. Designed to regulate international trade between States through prior informed consent procedures, the Convention was not conceived to govern the rapidly expanding ecosystem of digital marketplaces, where asbestos-containing products may be advertised, purchased, and shipped directly across borders with limited regulatory scrutiny.

Accordingly, the online trade of asbestos should be recognized as an additional and largely overlooked consequence of the continued global circulation of asbestos. Addressing this challenge will require not only enhanced awareness among consumers, distributors, and e-commerce platforms, but also the development of a dedicated international regulatory framework specifically tailored to online asbestos sales. Such a framework should establish harmonized rules for product identification, mandatory disclosure of asbestos content, platform accountability, cross-border enforcement mechanisms, and restrictions on the sale of asbestos-containing products to jurisdictions where asbestos has been banned.

Without regulatory measures specifically designed for the digital marketplace, online distribution risks undermining existing national and international efforts to control asbestos exposure. The emergence of e-commerce as a new channel for asbestos circulation therefore calls for a regulatory response that extends beyond the traditional scope of the Rotterdam Convention and reflects the realities of contemporary global trade.

Acknowledgements

Dr. Bianca Rimoldi (INAIL, Milano, Italy) is kindly acknowledged for the critical revision of the manuscript and fruitful discussions. We acknowledge Dr. R. Fantini and Dr. F. Colombo for help with the analysis of the asbestos gloves.

Author contributions

The authors equally contributed to the conceptualization, drafting, writing, reviewing of this manuscript.

Funding

No funding.

Data availability

The samples analysed, the experimental data and the product traceability data are kept at the Department of Chemical and Geological Sciences of the

University of Modena and Reggio Emilia (Modena, Italy). They are available upon request to the corresponding author.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

All authors consent to the publication of this manuscript.

Competing interests

The authors declare no competing interests.

Received: 3 June 2026 / Accepted: 5 October 2026

Published online: 14 October 2026

References

1. Bozzini E. The European Union regime for chemicals: Toxic and regulatory ignorance. *De Gruyter Handb Europ Union Env Policy*. 2026;21:401–14.
2. Camus M. A ban on asbestos must be based on a comparative risk assessment. *CMAJ*. 2001;164(4):491–4.
3. Castleman B. Controlled use of asbestos. *Int J Occup Environ Health*. 2003;9(3):294–98. <https://doi.org/10.1179/oeht.2003.9.3.294>. PMID: 12967168.
4. CLP Regulation EC No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. 2008. <http://eur-lex.europa.eu/Notice.do?val=486098:cs&lang=en&list=490877:cs,486098:cs&pos=2&page=1&nbl=2&pgs=10&hwords>. Accessed 1 March 2026.
5. European Commission: Directorate-General for Employment, Social Affairs and Inclusion, RPA Europe Prague s.r.o, Risk & Policy Analysts Ltd., Prevent-Partner, Institute of Occupational Medicine, Danish Technological Institute, RPA Europe S.R.L., Amsterdam University Medical Centers (PMA), Office for Economic Policy and Regional Development Ltd. (EPRD), Vencovsky D, Vidal F, Garrett S, Richards R, Wright E, Clack T, Bannister Curran L, Copping D, Standing H, Curic M, Szabo N, Lappe-Osthege T, van Balen P, Wissink E, van der Meer N, Galea KS, McLean P, Jones A, McElvenny D, Butera S, Lyng RJ, Camboni M, Chiabrando F, Schaafsma F, Maas J, Dehghani A, Agnieszka K. Guidelines for managing asbestos related health and safety risks at work. 2025. <https://doi.org/10.2767/3790800> Accessed May 31, 2026.
6. Gualtieri AF, Malferrari D, Di Giuseppe D, Scognamiglio V, Sala O, Lassina-antti Gualtieri M, et al. There is plenty of asbestos at the bottom. The case of magnesite raw material contaminated with asbestos fibres. *Sci Tot Env*. 2023;898:166275. <https://doi.org/10.1016/j.scitotenv.2023.166275>.
7. Hyskaj A, Weiszburg TG, Harman-Tóth E. Asbestos legislation SITREP in the European Union: a mixed-methods analysis of parliamentary questions (1995–2024). *Env Sci Europe*. 2026;38(1):3–25.
8. IARC. IARC monographs—arsenic, metals, fibres, and dusts, volume 100 C. A reviews of human carcinogens. IARC monographs on the evaluation of carcinogenic risks to humans. International Agency for Research on Cancer, World Health Organization; 2012. <https://publications.iarc.who.int/Book-And-Report-Series/Iarc-Monographs-On-The-Identification-Of-Carcinogenic-Hazards-To-Humans/Arsenic-Metals-Fibres-And-Dusts-2012>. Accessed 28 May 2026.
9. IBAS International Ban Asbestos Secretariat. 2026. <http://www.ibasecretariat.org>. Accessed 27 May 2026.
10. Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade UNEP/FAO/TC. / COP6/20. In: Conference of the Parties, Sixth Meeting, Geneva, 28 April–10 May 2013. New York: United Nations; 2013.
11. <http://www.pic.int/TheConvention/ConferenceoftheParties/Meetings/COP6/tabid/2908/language/en-US/Default.aspx>. Accessed 17 March 2026.
12. Magnavita N, Congedo MT, Di Prinzio RR, Iuliano A. War journalism: an occupational exposure. *BMJ Case Rep CP*. 2023;1014. <https://doi.org/10.1136/bcr-2021-245165>.
13. Tims A. Asbestos found in children's play sand sold in UK. *The Guardian*; 2026.
14. <https://www.theguardian.com/business/2026/jan/24/childrens-play-sand-ho-bbycraft-asbestos-removed-recall>. Accessed 10 July 2026.

15. Virta RL. Asbestos. Geology, mineralogy, mining, and uses. Washington, DC, USA: US Department of the Interior, US Geological Survey; 2002.
16. World Health Organization (WHO). Determination of airborne fibre number concentrations: a recommended method by phase contrast optical microscopy (membrane filter method). Geneva: World Health Organization; WHO Library Cataloguing in Publication; 1997. p.1–53.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.