

ASBESTOS CONTAMINATED SITES: SAFETY MEASURES TO PROTECT WORKERS AND LIVING ENVIRONMENTS

FOREWORD

Italy, in the past, was among the major world producers of asbestos and Asbestos Containing Materials (ACMs). Since the post-war period, about 3,800,000 tons of raw asbestos have been extracted in It-

aly, with an import of about 1,900,000 tons. Asbestos was processed in various industrial plants, scattered throughout the peninsula, to produce multiple types of artefacts. In 1992, Italy banned the extraction and use of the mineral, but there are still numerous sites in the national territory with the presence of ACMs, still to be reclaimed.

ASBESTOS CONTAMINATED SITES

Scientific studies show that about 3% of the national territory is highly contaminated by substances that are dangerous for humans and the environment. Multiple sites have been identified, in relation to the different contaminants and the extent of the pollution. To date, the Ministry of Environment has identified 42 Superfund Sites (SS) to be reclaimed, distributed heterogeneously throughout the national territory. Among them, 11 are mainly contaminated by asbestos and the pollution is widespread in most of the area, while in another 5 there is a secondary contamination by asbestos which is present, among other contaminants, in a limited but significant portion of the area. In addition, more than 12,000 Sites to be reclaimed of Regional Interest (Ris) and others of municipal competence (Cis) were detected. Pursuant to Law 101/03 and its implementation Decree dated 18/03/01, an additional database has been created specifically dedicated to asbestos. This is constantly updated and has to date registered over 107,000 sites with the presence of asbestos or ACMs still to be reclaimed, which however could increase in the near future.

INAIL'S CONTRIBUTION TO SUPPORT PUBLIC AUTHORITIES

Inail's research activity has devoted great attention to the complex issue of asbestos, proceeding to the detection of sites contaminated by this substance, both in anthropized and natural environments, as well as to the identification of measures for the containment of risk, the protection of workers and the safeguarding of resident communities. The work carried out up to date by the Department of Technological Innovations and Safety of Plants, Products and Human Settlements (Ditspia) regarding asbestos contaminated sites, carried out in collaboration with Universities, Research Centres and Public Authorities, has led to the development of numerous technical reference

documents, available free of charge on the institutional website:

<https://www.inail.it/cs/internet/comunicazione/pubblicazioni.html>

Information and training activities have been also launched for citizens and operators in the sector, as well as inspections and environmental monitoring campaigns. Lastly, more than 400 technical-scientific consultations were developed for Public Authorities, of considerable complexity and expressly relating to emergency safety measures and the characterisation, remediation and environmental restoration of sites contaminated by this dangerous pollutant. Currently, with the 2022-2024 Research Activity Plan, research activities have also been launched concerning the development of new types of Personal protective equipment (PPE) with augmented reality viewers, innovative analytical methods both from the laboratory and remotely (micro-XRF, HSI, remote sensing, etc.) and high-tech instrumental prototypes to support operators on-site. Inail has invested in this sector by financing not only research, but also the training of qualified personnel through scholarships and PhDs. All this testifies to the strong attention that the Institute dedicates to this issue in order to integrate, improve and harmonise intervention and safety procedures on a national and international scale.

WORKER AND LIVING ENVIRONMENT SAFETY MEASURES

The reclamation of asbestos contaminated sites require the adoption of specific prevention and protection measures in order to guarantee the minimum asbestos fiber dispersion in the environmental matrices. Taking into account the complexity of the operating situations (indoor/outdoor, static/dynamic confined environments, presence of friable/compact asbestos, etc.), some of the main implementation criteria are listed below.

PREVENTION MEASURES

In SS and RS sites, the entire area subject to the interventions must be delimited around the perimeter with suitable fencing, to limit access to operating personnel and supervisory agencies. Suitably sized and located signs must also be affixed (anti-intrusion, prohibition of access to non-professionals, obligation to adopt PPE and danger of inhaling dangerous fibers). At the work area entrance, a Personal Decontamination Unit (PDU) should be installed, consisting of at least 4 rooms pursuant to Ministerial Decree 06/09/1994. In the case of interventions on large areas, a PDU at the entrance to the site and one in the vicinity of the activity area are to be set up. For safety purposes, the use of a PDU consisting of 5 rooms, with a closed and unidirectional circuit, is recommended on SS. It is ad-

visible to provide a point outside the PDU for washing footwear, before the operator enters the “contaminated room”, in order to reduce contamination. Specific procedures must be established for cleaning the PDUs at the end of the working day. The personnel assigned to this cleaning operation must be duly equipped with suitable PPE and trained on the correct procedures for its use. It is absolutely forbidden to install toilets inside the work area in SSs and RSs, other than the one(s) provided for in the clean changing room of the PDU. In the case of working in statically and dynamically confined environments, a specific material decontamination unit (MDU) should be installed, at least with three stages for the decontamination of equipment and materials, as well as for the safe escape from the confined area of the asbestos-containing waste (ACW). In the case of interventions on ACM/ACW in living environments, such as those for the removal of underground water pipes, where it is generally not possible to install a PDU, it will in any case be necessary to provide a dressing/undressing area, where to put on the PPE and deposit it in a suitable closed container at the end of the work shift. In the absence of a PDU, for the correct removal of the PPE, rubber footwear or high safety shoes must be washed first, then gloves and overalls must be removed. The previously mentioned footwear must be removed after that and, lastly, the airway protection mask. On asbestos contaminated sites, with particular regard to the outdoor environment, the provision of dust abatement systems is also essential, especially during safety/remediation activities. We recommend the use of spray guns/atomisers in the area being processed, in addition to wetting all the roads inside the sites (low pressure nebulisation, sweeper with absolute filters, wetting with tank trucks, etc.).

PROTECTIVE MEASURES

The protective measures are aimed at protecting people and include Collective Protection Devices (CPD) and PPE. Legislative Decree 81/2008 establishes that collective protection devices must be given priority over individual protection devices. In the case of asbestos, CPD are an effective solution during the remediation of asbestos cement roofing to reduce the risk of falling from above due to breaking of the slabs (such as fall protection nets, lifelines, etc.). In the asbestos reclamation areas, all those who access the site must always be equipped with suitable PPE. Each employer must

therefore pay the utmost attention in choosing the type, size and quantity of PPE to be provided on site to each worker. For example, the purchase of a single suit size for all operators must be avoided (risk of being over-abundant and hindering for some, or too small and at risk of breaking along the seams for others). For the choice of suitable PPE, a specific Risk Assessment will be carried out, also based on the analysis of the operators’ duties and the analytical results of personal and environmental air monitoring. In particular, we recommend the use of gloves, non-woven overalls of the third category, type 4-5 or similar (disposable) with a hood to be worn under the helmet and seams covered with adhesive tape, rubber shoes or high safety shoes, water repellent (to be cleaned accurately with water at the end of the shift). The sweatpants must be inserted outside the rubber boots or high safety shoes and sealed with tape. Similar sealing must be provided between the gloves and the cuffs of the suit. The use of disposable footwear should not be allowed in the outdoor environment as they are easily torn and a potential cause of slips and falls. As far as the protection of the airways is concerned, it is recommended for those involved in safety or reclamation operations (operators engaged in activities in direct contact with contaminated material) to use a half mask with P3 filter, a full face mask with P3 filter or of higher category devices. For personnel (transporters, supervisory bodies, workers maintaining green areas, etc.) whose work activity does not involve direct contact with contaminated material, it is considered appropriate to use a filtering mask (FFP3) or half/full face mask with P3 filter. Please remember that in case of use of full face masks or half masks with P3 filter, before their removal, they must be carefully decontaminated with water and subsequently internally, and any filters must be replaced. Exhausted filters, similar to disposable filter facepieces (FFP3), must be disposed of as waste contaminated with hazardous substances and placed in a sealed bag. All reusable PPE will be placed in the appropriate PDU lockers.



RIFERIMENTI NORMATIVI

- Paglietti F., et al., (2020), “Siti contaminati da amianto: normativa, mappatura e tecniche di bonifica da adottare a tutela dei lavoratori addetti e degli ambienti di vita”, Sigea – Società Italiana di Geologia Ambientale, ISSN 1591-5352;
- Paglietti F., et al (2018), “Remediation Activities in an Italian Superfund: Case Study of an Industrial Plant in Broni”, Proceedings of the 4th World Congress on New Technologies (NewTech’18), Madrid, August 19-21, DOI: 10.11159/icepr18.166;
- Min. Decree 06/09/1994 Regulations and technical methodologies for the cessation of asbestos.
- Leg. Decree 81/2008 Consolidated law on health and safety at work.