

The Management of Waste Containing Asbestos in Romania and the European Union

Silvian IONESCU
National Environment Guard
silvian.ionescu@gnm.ro

Abstract. *The complex problem of waste management caused it to be claimed by an increasing number of disciplines in the last period, coming to the conclusion that many times such an inter- and pluri-disciplinary effort is necessary in order to reach to the expected results. Romania has a significant quantity of asbestos content wastes, as a consequence of the fact that no recycling technologies apply to them, the applicability rate being very low also at international level. The polybest is the solution offered for recycling and recovery of asbestocement through a processing technology ensuring the neutralization of the noxious factors.*

Keywords: wastes; asbestos; management of waste containing asbestos; inertization technologies; polybest.

JEL Codes: Q53, Q56.

REL Codes: 15B, 15C.

1. Introduction

Following the studies which proved the noxious effects of asbestos on human health, several member states of the European Union implemented their procedures giving priority to the withdrawal from usage of the asbestos containing materials.

Asbestos as filling/reinforcement material has the role to improve the physical – chemical properties and the workability of the polymeric material. Its performances are comparable with those of other fibrous materials, such as glass and carbon. As an effect of these characteristics, asbestos and the composite materials with asbestos filling/reinforcement were intensely used mainly for sealing and thermal, fire, mechanical, noise insulations etc. Until the beginning of the '90s, asbestos cement held a major place in the production of asbestos reinforced composites. The asbestos reinforced polymeric composites held a more modest place due to the preference – even since that time – for glass fibers.

Asbestos is a forbidden material at this moment, the Government Decision no. 124/2003 regarding the prevention, reduction and control of environment pollution with asbestos, stipulating that "for the purpose of protecting the public health and environment safety, from January 1st 2007 all selling activities and use of asbestos and asbestos containing products are forbidden". Both the Romanian law, respectively the GD no. 124 / 2003 regarding the prevention, reduction and control of environment pollution with asbestos, updated, as well as the European Directive no. 87/217/EEC regarding the prevention and reduction of environment pollution caused by asbestos, provide that asbestos can no longer be produced, sold or handled.

2. The management of wastes containing asbestos in Romania

Regarding the management of wastes containing asbestos, at national level there are only two area storage facilities for hazardous wastes supplying services for third parties, including for the asbestos containing wastes. These cover complex wastes management activities, which include takeover, transport, temporary or final storage, processing, etc. The asbestos containing wastes management operations are performed according to the REACH norms (European Community Regulation on Chemicals and their Safe Use), as follows:

a) Performance of preparing works:

- The takeover of the location which is going to be cleared of pollution (this will be done by a mixed commission made up of the representatives of the beneficiary and those of the contractor, based on protocol);
- The development of the dressing room areas for the personnel, by installing the dressing rooms of developed container type;
- The development of a warehouse for protection equipments of the

personnel, environment protection materials, working equipments, packages, intervention materials, decontamination materials;

- The provision of electric power sources by the installation of an electric panel for supply, necessary for the lighting and heating of the mobile dressing rooms, for the operation of the decontamination equipments;
- The isolation of the working area by the installation of the delimitation fence for the access of the persons and transport equipments;
- Developing the wastes storage area on types of wastes, in the form of a platform, delimited and equipped in order to avoid the soil contamination with dangerous wastes.

b) Performance of dismantling and collection works:

- Protection of soil against contamination with dangerous wastes, by the installation of a protection film;
- Installation of stairs, platforms and scaffolding in the working area;
- Installation of the dangerous waste collection container in the working area, at the base of the roof;
- Performance of successive dismantling operations of asbestos cement. The dismantling operations are made from the ridge (top) of the roof towards the base, on well delimited areas, so that the wastes reach, by falling from the inclined plan of the roof, directly into the collection container;
- Collection of wastes in separate containers, on each type of waste;
- Recovery of wastes which will fall outside the collection containers, on the areas protected with film;
- Aspiration of the layer of bitumen coated cardboard with professional aspirators for the purpose of collecting the asbestos cement dust remained after the completion of the installation of the asboement, in the working area of the roof;
- The completion for each building of the dismantling and collection operations of the entire quantity of asboement, with the cleaning of the entire roof and of the working area around the asboement wastes and powders building and their taking over in closed containers;
- The continuous taking over of the wastes stored in tightly closed containers, from the working area, immediately after filling them, these being transported to the processing points for elimination;
- The packing of the asboement wastes into bag type, tight recipients, or into tightly sealed film.

The transport is made under the supervision of an ADR authorized safety advisor (for the road transport of dangerous goods) from the part of the transporter, in order to check the observance of the provisions of the specific law regarding the transport of dangerous substances and the assurance of a

corresponding way of action in emergency situations. The transport from the beneficiary is made with specialized and authorized vehicles, having transport licenses, equipped with ARD kits and intervention means in case of accidental pollution, driven by ADR authorized drivers and accompanied by an ADR authorized safety advisor. In order to make the transports, all the provisions included in the GD no. 1061/2008 regarding the transport of dangerous and non-dangerous wastes on Romanian territory (Delivery note, other necessary documents such as Safety Data Sheets, Security Data Sheets etc.) have to be observed. In this respect, the County Inspectorate for Emergency Situations at local level will be informed, and the latter will establish the covered routes.

c) Final storage of wastes containing asbestos:

This operation is made according to the Implementation Plan of Directive 99/31/CE regarding the storage of wastes. The wastes containing asbestos are treated and stored in separate cells of the dangerous wastes storage facilities. The elimination in fact involves the storage in the form of ultimate waste, respectively the packing into bag type flexible recipients of 1 m³, waterproof, that are stored in a specially developed asbestos cell, after which, this is covered with a layer of inert material. The ultimate waste has to fulfill compulsorily the following criteria:

- To be found on the list of wastes accepted for storage in the respective storage facility, according to the environment authorization;
- To be accompanied by the necessary documents and to observe the acceptance criteria.

All the results of the acceptance checks are recorded in the operation log (in electronic or written form). If following the acceptance check it results that all the acceptance requirements are not observed, the operator directs the transport of wastes to the storage area.

The visual check is repeated also at unloading the wastes. If following the visual check any doubts appear regarding the observance of the storage requirements or if it is found that there are differences between the accompanying documents and the supplied wastes, then a check is made, the analyzed parameters being established according to the type and aspect of the wastes. In the cases in which check analyses are made, control samples will also be taken which have to be kept for at least one month.

If the wastes are not accepted at storage, the operator of the storage facility immediately informs the generator and the Environment Protection Agency, the transport being isolated and kept in the safety area. All these cases are recorded in the operating log of the storage facility. If the supplied wastes are not according to the data from the accompanying documents, however they are within the acceptance requirements and are accepted for storage, then this will also be mentioned in the operating log and the generator of the wastes as well as the Environment Protection Agency are notified.

3. Technologies of recycling and inertization wastes containing asbestos.

The polybest

Due to the toxicity of asbestos and the difficulties met in the management of asbestos content wastes, as well as in the light of the national and international law referring to these problems, many scientific collectives and industrial companies focused their attention on discovering new technologies for making these wastes inert.

The methods for rendering them inert studied so far can be divided into two large categories: *thermal methods and chemical methods*, or combinations of them, and involve chemical and crystalline changes of the different asbestos forms investigated

Following the research made, included in a PhD degree thesis, the author found that the legislation regulating this field (both the national one and the community one) can be subject to changes.

Thus, the main amendment that might be brought to the normative acts in force takes into account two operational issues in the opinion of the author.

The first operational aspect refers to the possibility of handling, breaking, shredding and grinding the historical products containing asbestos which, if operated, handled and processed without human presence (with robots or mechanized processing lines) can be exonerated from the provisions of the current legislation of the European Parliament.

The designing of the operation schemes that described the production of polybest (a safe material from the point of view of toxicity, chemically stable and efficient from an economical point of view for some uses, obtained by an experimental recycling model of the asbo cement wastes and of the polymeric wastes in the form of composites with polymeric matrix) and the rendering inert of asbestos were developed exactly in this manner, thus eliminating the risk of exposure to asbestos during the performance of the processes. The ecological material is prepared for entering into the production of plastics and offers the guarantee of safe and long lasting use.

The second operational aspect refers to the inertization of the raw asbestos, with toxic potential, by encapsulating it into polymeric mass, hypothesis in which, at the beginning of the process of obtaining the composite material, the asbestos shaped fraction is included in the category of dangerous substances, and in the final product this is inert and safe for human health, as proved by the tests performed, certified by the determinations of the National Institute of Public Health. Following the tests performed it was proved that Polybest, should it be kept in the most severe conditions of bad weather, would generate an amount of wear residuals of 100 mm^3 , in a period of time between five and 71 years, according to the type of polymer in which it was encapsulated. It has to be mentioned that within the tests

made extreme natural atmospheric conditions were simulated, of high intensity and with continuous temporal dynamics, such an abrasion force being extremely unlikely in natural weather conditions, even in the event of occurrence of extreme events – earthquakes, atmospheric turbulences, abundant precipitations. Even in these circumstances, the asbestos wastes have to be manipulated in conditions of complete isolation.

Conclusions

Finding alternatives at storing asbestos cement wastes, which is currently the only sustainable option from an economical point of view, of elimination, has to represent a priority for the European countries, so much the more as the central element of Directive 2008/98/EC regarding wastes is represented by the recycling operation.

Thus, the author considers that the results reported at experimental level regarding the lack of toxicity of the product obtained following the thermal inertization of asbocement or its embedding into the polymeric mass could represent the starting point in the discussions regarding flexibility and adaption of the European and national legal provisions creating the general frame of the asbestos content wastes management.

The manufacturing of Polybest opens the way towards reusing the products containing asbocement in more complex domestic and industrial applications than those existing so far. If, for the moment, the author considers the recycling in products such as snow screens, the exterior fences blades, road pillars etc, in the future the range of these uses can be extended.

References

- Directiva nr. 87/217/EEC privind prevenirea și reducerea poluării mediului cauzată de azbest
Hotărârea Guvernului nr. 124 / 2003 privind prevenirea, reducerea și controlul poluării mediului cu azbest, actualizată
Hotărârea Guvernului nr. 1061/2008 privind transportul deșeurilor periculoase și nepericuloase pe teritoriul României
Ibănescu, C. (2008). *Ingineria materialelor composite polimerice si procese de prelucrare a acestora*, Curs univ., Universitatea Tehnică „Gh. Asachi” Iași, Cap. I-III
<http://omicron.ch.tuiasi.ro/~inor/matmip/pdf/IMC.pdf>
Kelly, A. (1990). *Concise Encyclopedia of Composite Materials*, pp. 18-21, Pergamon Press, Oxford
Mortensen, A., (2007), *Concise Encyclopedia of Composite Materials*, pp. 12-14, Elsevier, Amsterdam
Pye, A.M., „A review of asbestos substitute materials in industrial applications”, *Journal Hazardous Materials*, 3(2), 1979, p. 125
Regulamentul (CE) nr. 1907 / 2006 al Parlamentului European și al Consiliului privind înregistrarea, evaluarea, autorizarea și restricționarea substanțelor chimice – REACH (European Community Regulation on Chemicals and their Safe Use)
Titow, W.V. (2004). *PVC Technology*, 4th Edition Elsevier Appl. Sci. Publ., Essex, Anglia