The circular economy in the production waste of special papers

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Ahlstrom-Munksjo's special papers are suitable for a wide variety of applications but are mainly applied in filtration systems dedicated to the automotive sector[1]. The production of these papers is based on the impregnation of cellulose with different types of thermosetting resins, usually phenolic and melamine-based, using formaldehyde as a starting reagent. It is worth mention that the production of papers does not involve the complete polymerization of the resins and, straightforwardly, wasted paper has a high formaldehyde content (>1000ppm), which originates not only from unreacted formaldehyde but also from the cleavages of the polymer chains that occur randomly during the polymerization reaction.
Among others, the presence of formaldehyde, being the latter classified as carcinogenic[2], is of concern both from a human health perspective and for the environment, where it could be released. This implies that the scraps having a high formaldehyde content need to be disposed of as hazardous waste (CER 15.02.02)[3], with a consequent environmental impact and higher disposal costs for the company. The aim of the project is the development and optimization of a thermal process, aiming to remove the excess of formaldehyde or to increase the cross-linking of the resin and consequently consuming the free formaldehyde. Once treated the waste could be discarded of as not dangerous, reducing the costs of disposal, or used as a raw material for secondary production processes.

Keywords (3): *Special papers, formaldehyde, environmental impact reduction*

(1) *Ahlstrom financial report– 2022*. https://www.ahlstrom.com/Investors/reports-and-presentations/ahlstrom/2022/

(2) *List of Classifications – IARC Monographs on the Identification of Carcinogenic Hazards to Humans*. https://monographs.iarc.who.int/list-of-classifications (accessed 2023-04-12).

(3) Elenco dei rifiuti istituito dalla Decisione della Commissione 2000/532/CE del 3 maggio 2000, allegato D

Acknowledgements: This research acknowledges support from the project CH4.0, under the MUR program "dipartimenti di Eccellenza 2023-2027" (CUP D13C22003520001), D.G. acknowledges Decreto Ministeriale n. 1061 from MUR and AHLSTROM-MUNKSJÖ S.P.A. for funding the PhD scholarship.