



ECO-FRIENDLY CERAMIC MEMBRANE BIOREACTOR MBR BASED ON RECYCLED AGRICULTURAL AND INDUSTRIAL WASTES FOR WASTE WATER REUSE

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REMEB PROJECT

REMEB (REcycled MEMbrane Bioreactor) is a European Research and Development project in the framework of the call H2020-WATER-2014, with a total budget of 2,361,622.50 Euros. It is a project for first market application developments. It has duration of three years, starting in September 2015 and concluding in August 2018.

Wastewater treatment through the use of a membrane bioreactor (MBR) can be an exceptional alternative to increase the reclaimed water as a worldwide habitual application. The main problem of the current MBRs, using inorganic membranes, is the high cost of the technology. REMEB project proposes a new type of MBR which will significantly decrease the cost of the technology.

The main objectives of the REMEB project are the implementation and validation of a low-cost recycled ceramic membrane bioreactor (MBR) for water reuse in a Wastewater Treatment Plant (WWTP).

The validation of REMEB MBR will be carried out in Aledo WWT.



Figure 1. Aledo WWTP

VALORIZATION OF AGROINDUSTRIAL WASTES

The agro-industrial wastes used in membrane composition are orujillo, chamotte and marble powder.



MEMBRANE MANUFACTURING PROCESS

In Figure 2 it is shown the membrane support manufacture based on the extruded ceramic tiles shaping.

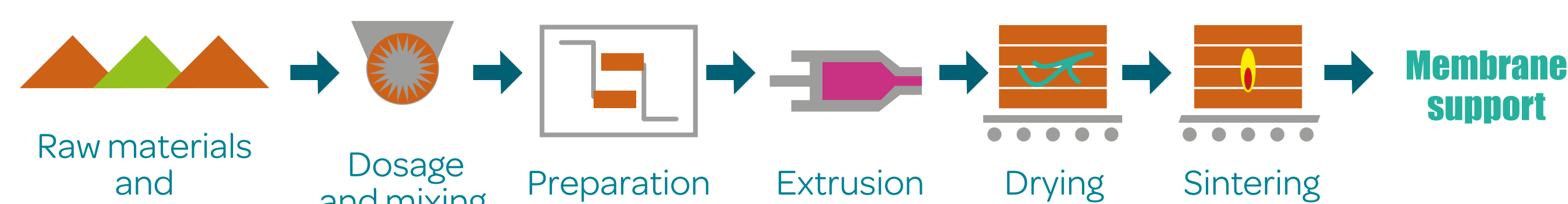


Figure 2. Membrane support manufacture scheme

Figure 3 shows the deposition of the active layer on the membrane support. Layer is deposited by dip-coating and subsequent drying and sintering

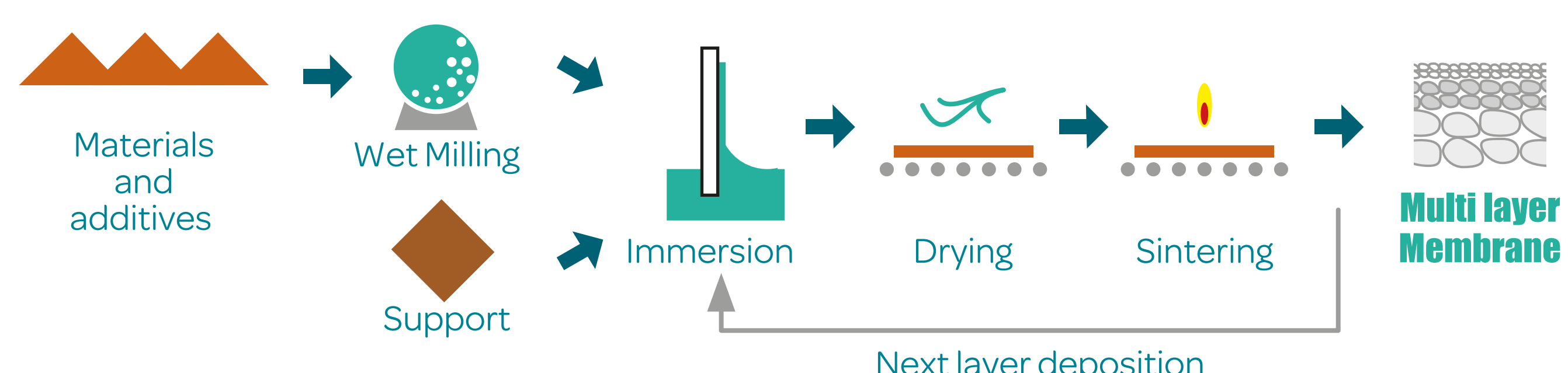


Figure 3. Active layer deposition scheme

LABORATORY SCALE



- Selection of the best wastes and raw materials for membrane manufacture and replication of the technology in Spain, Italy and Turkey.

FULL SCALE



- Development of the filtration module and selection of the best configuration to collect the permeate.
- Full scale membrane manufacturing.
- Validation in Aledo WWTP.
- Comparison between REMEB MBR and the MBR operating in parallel with organic flat-sheet membranes.

BUSINESS PLAN

SPECIFIC OBJETIVES

- Validation and commercialization of a new type of MBR with lower expenses by using low cost ceramic membranes.
- Comparison between REMEB MBR and the MBR in operation in the WWTP selected for the validation, assuring that treated water in REMEB MBR has the same or higher quality than the currently used MBR.
- Valorization of waste products from different agricultural and industrial processes (by-products); by means of the introduction of these waste products, the price of the low cost ceramic membrane will be reduced in comparison with commercial ceramic membranes, made from alumina, zirconia or titania.
- Study of the impact and technology replication in several strategic locations in order to stimulate a wide and fast deployment in European and non-European countries, for water reuse in regions with water scarcity.
- Exhaustive study of industrial sectors and companies with potential of REMEB MBR implementation.
- Manufacturing of an innovative product using recycled materials; a recycled low cost ceramic membrane, optimum for MBR applications.

PROJECT PARTNERS

REMEB is being developed by a consortium comprised by 11 partners from scientific world and public and private sectors from seven different countries: Spain, France, Cyprus, Norway, Italy, Turkey and Colombia.



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