DEFEAT

Development of an Innovative Insulation **F**ire Resistant Facade from the Contruction and D**e**molition W**a**s**t**e.

Newsletter

2nd Issue: September 2021

DEFEAT Highlights

Work Progress

Despite the difficulties and limitations deriving due to the Covid-19 pandemic, the DEFEAT project is progressing well, with small deviations from the original timeframe:

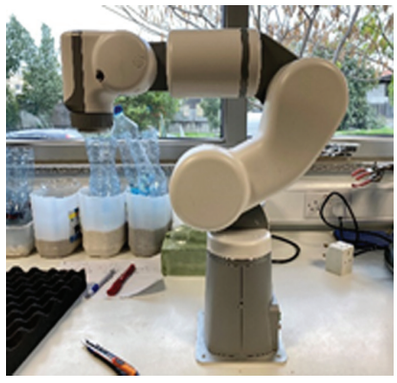
√ Several deliverables have been prepared and submitted on time.

√ The Project Management and Monitoring is progressing and reports such as Consortium Agreement, Project Management Plan, and Risk and Mitigation Plan have been developed.

√ The Initial Dissemination, Exploitation and Innovation Management strategies have been defined.

The optimization of the Construction and Demolition Waste (CDW) separation process in order to produce "clean" wastes, through the image processing has been moving forward. The necessary equipment consisted by a 3D-camera and two robots have been purchased from specialized companies from abroad. The equipment has been assembled and research is currently being conducted on the "training" of the robots through machine learning techniques. A small-scale application of the image processing on the CDW separation will be organized as soon as the technical work will be completed.

CDW Robotic Separation System



Robotic Arm

The "in-lab" full characterization of the waste concrete and ceramics derived from the CDW separation is fully completed.

DEFEAT Project (INTEGRATED/0918/0052) is co-funded by the European Regional Development Fund and the Republic of Cyprus through the Research & Innovation Foundation.

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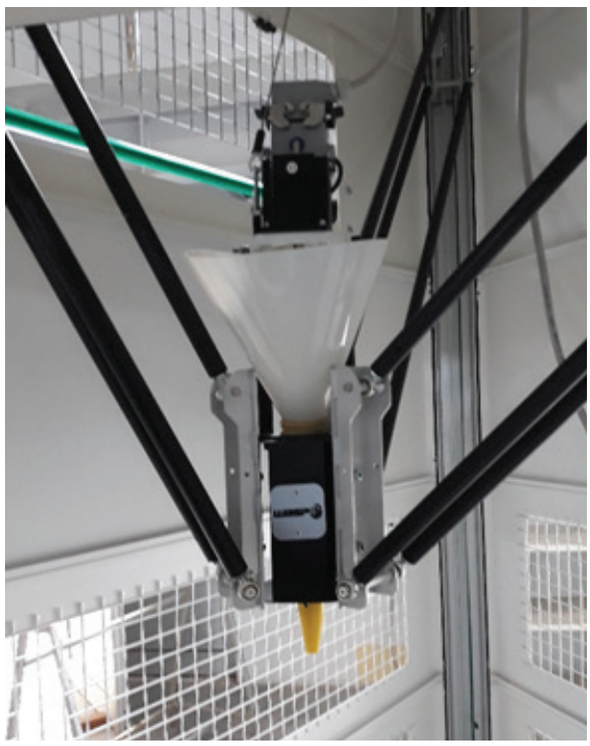
3D Printer for Cement - Based Materials

The characterization was carried out on several batches of the received wastes, in order to cover a range of the existed elements and to result to a generic characterization of the materials under investigation. For that reason, chemical, mineralogical and particle size analyses took place, as well as measurements of the density of the raw materials and dissolution tests. Detailed reports and tables of results have been completed by the research team.

Moreover, preliminary work has been conducted regarding the development of the fire and thermal insulation materials coming from the CDW, along with the prototype that will combine the fire resistance and the insulation properties. Progress is also taking place for the engineering of the properties for the material production. Further to the production of the new materials with traditional methods (i.e. casting), work has been also conducted on their development with 3D-printing, by modifying the original syntheses.

Last, the consortium partners are also working on the development of guidelines for a Strategic Action Plan for recycled CDW Reuse, aiming to identify and report possible mechanisms that can assist in the successful implementation of a recycled CDW reuse scheme in Cyprus. Towards this end, a questionnaire has been developed and will be disseminated in September 2021 to the key stakeholders of the CDW reuse program to solicit their perceptions.



3D Printer Nozzle

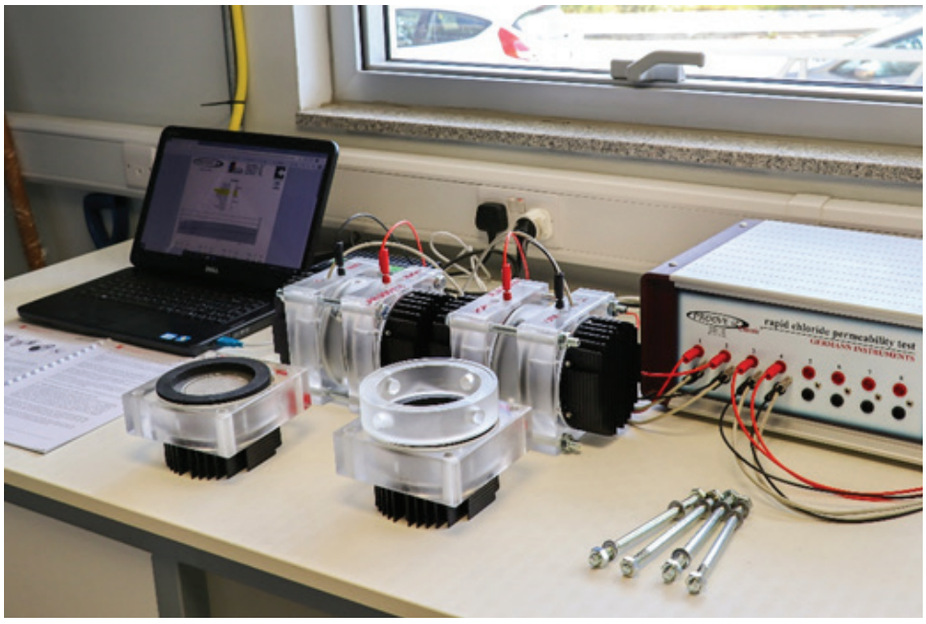
New DEFEAT Equipment!

Important **equipment** has been **purchased** for the needs of the DEFEAT project:

» Specifically, a 3D-printer suitable for cement-based materials that has the capacity to print in an area of 1.0(L) x 1.0(W) x 0.5(H) meters has been installed in the lab of Frederick Research Center.

» In addition, as it has been mentioned above, a robotic system for the separation of the waste materials has been purchased by the industrial partner Resource Recovery Cyprus. The system consists of a high accuracy 3D-camera, 2 robotic arms and a conveyor. The system is currently installed in the lab of Frederick Research Center.

» Last, a unit for the determination of the Rapid Chloride Permeability of materials has been purchased by Frederick Research Center.



Rapid Chloride Permeability Test Equipment

DEFEAT Meetings & Events

Stakeholder's Workshop

A workshop took place on the 19th of May of 2021 in which the research team presented the draft version of the questionnaire prepared for the needs of WP10. A number of stakeholders attended the workshop and expressed their ideas regarding the finalization of the questionnaire. The questionnaire aimed to solicit the opinions and perceptions of important stakeholders related to the reuse of CDW in Cyprus. The questionnaire is divided into different sections; general information, social, economy, feasibility, environment, political, technical, awareness and participation, CDW recycling and reuse. The questions are mainly structured so that the resulting analysis will generally follow standard statistical approaches. The content and format of the questionnaire was extensively discussed among the partners and stakeholders to ensure that is understandable and comprehensive. The attendees of the workshop expressed their concerns for some points and their suggestions were incorporated into the questionnaire, which is ready to be disseminated among the targeted stakeholders' groups during October 2021. The stakeholders' groups which need to answer the questionnaires include CDW contractors, construction companies, waste management experts, private organizations and agencies, as well as related governmental entities. The stakeholders will spread the questionnaire to their networks in order to have a representative sample.

1st Steering Committee Meeting

DEFEAT 1st Steering Committee Meeting was held on 1st of December 2020 virtually, coordinated by the Host Organization of the DEFEAT Project, Frederick Research Center, with the participation of the Project Coordinator, the Technical Manager, the Quality Manager and all the WP leaders. Representatives from all the project partners were also invited and attended the meeting. The aim of the meeting was to review the project's progress, make decisions related to project's technical issues and synchronize the technical research progress across the WPs.

The 2nd Steering Committee Meeting has been scheduled for the 30th September 2021. More information will be disclosed on the 3rd newsletter.

Participation to the 2nd International Conference on Circularity in the Built Environment (CiBEn)

DEFEAT Project Partner Frederick Research Center will participate to the 2nd International Conference on Circularity in the Built Environment (CiBEn), between 24-26 of November 2021. A paper titled "Optimization of Mix Formulation and Strength Evaluation Comparison of Casted and 3D Printed Geopolymer Specimens" will be presented to the attendees. Further information will be provided in the next Project's Newsletter.

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