

# KEOPS PROJECT: RESEARCH ON SUSTAINABLE HIGH-ADDED VALUE ALKALI-ACTIVATED CONCRETES BASED ON INDUSTRIAL WASTE

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The R+D+i project “KEOPS”, which is titled “*Research into integral sustainable alkali-activated and high added value solutions from construction and industrial waste*”, develops novel free OPC constructive solutions. KEOPS is presented under the synergistic interaction of 5 companies (CROMOGENIA, CEMENTOS CRUZ, ADEC GLOBAL, EXTRACO, and PREFHORVISA), supported by two technological centres (CETIM and Department of Civil and Environmental Engineering, UPC-BarcelonaTech). Electric arc furnace slags (EAFS) and construction and demolition waste (CDW) were screened and conditioned for its use as alkali-activated precursors or fine and coarse aggregates in different constructive purposes such as additive manufacturing, fast setting and low rebound solutions (shotcrete, plain concrete, etc.), and easy demoulding precast concrete. In addition, ad-hoc molecular synthesis of polycarboxylate grinding aids and superplasticizer were performed to enhance the alkali-activated materials (AAMs) final properties depending on the constructive solution. The most promising results were obtained in the formulations based on EAFS and steel aggregates using sodium silicate as an alkaline activator solution, with which it has been possible to carry out different pilot scales (3D printing pieces, sprayed concrete over slope, and precast concrete hollow blocks).

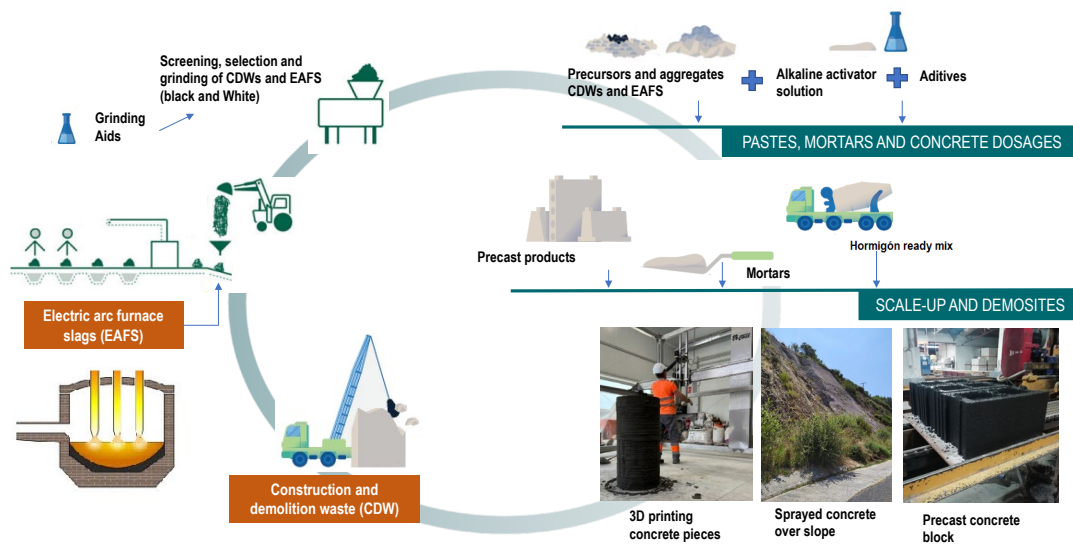


Figure 1 KEOPS project scheme