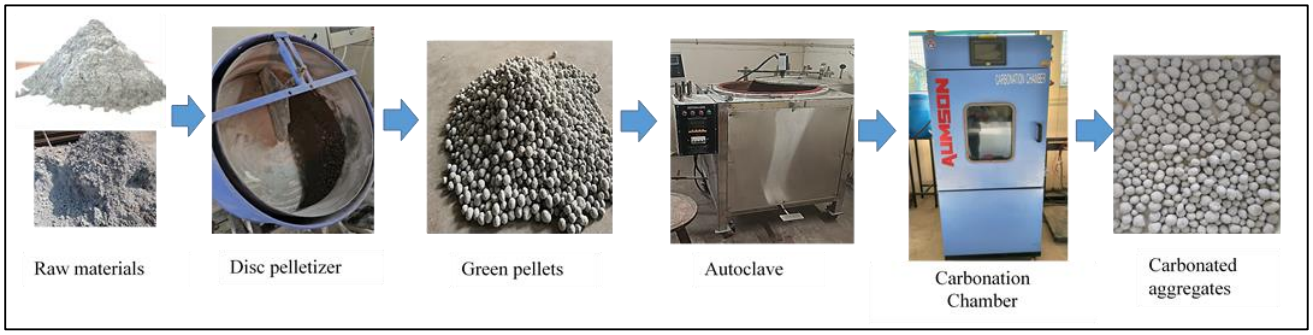
CO_2 sequestered autoclaved artificial lightweight aggregates

Technology in Brief

This technology produces CO_2-sequestered lightweight aggregates from siliceous and calcareous industrial wastes using autoclaving and pressurized carbonation. This process permanently stores 8–10% CO_2, producing rounded to sub-rounded aggregates (4–16 mm) that are up to 50% lighter than natural aggregates. A major advancement is the reduction of high water absorption in LWAs, as carbonation partially fills pores, enhancing concrete performance. These aggregates meet IS 9142 Part 2:2018 specifications and are suitable for structural and non-structural lightweight concrete, reducing material weight and carbon footprint while promoting sustainable utilization of industrial wastes.

Salient features/Advantages

1. **Carbon Utilization:** Up to 8-10% CO_2 by weight of aggregates can be sequestered permanently.
2. **Waste Valorization:** Turns siliceous and calcareous rich industrial wastes and similar residues into high-value aggregates, reducing disposal costs.
3. **Revenue Generation:** The product is suitable for structural and non-structural lightweight concrete, especially in urban high-rise construction and precast panels.
4. **Regulatory Compliance:** Supports industries in meeting Environmental, Social, and Governance (ESG) goals and upcoming carbon taxation norms.



End Product(s)	CO2 sequestered artificial Lightweight aggregates
Properties & Standards	Meeting the Specifications of IS:9142:2018 (Part 2)
License/Commercialization	Under process
TRL	5
Environmental Impact	CO_2-sequestered artificial lightweight aggregates offer significant environmental benefits by permanently storing 8–10% CO_2 within their structure, thereby reducing greenhouse gas emissions. They utilize industrial wastes diverting them from landfills and promoting circular economy practices. Being up to 50% lighter than natural aggregates, they reduce material usage and transportation energy.
Setup - Equipment required	Fabrication facility
Linkedin Video Link	https://www.linkedin.com/posts/csircbri_csir-india-pradeep-kumar-ramancharla-co%E2%82%82-activity-7325682608019820544-2VaT?utm_source=share&utm_medium=member_desktop&rcm=ACoAAE1ijyABshTzQUwK7Dj8mksi4yko5dgW6LA
Youtube Video Link	https://youtu.be/eWRJog76ekM