

Optimization of Concrete Mixture for 3D Printing

- Challenge / Opportunity:
 - Non-ferrous metallurgical slag residue used for low value applications / filler
 - Increase the slag valorization potential
- Approach:
 - Develop an Fe-rich slag-based 3D printable mixture
 - Compare with OPC-based mortar (Benchmark)
- Success Defined as:
 - The criteria to obtain 3D printable slag mixture is met and printing trial is performed
- Potential Impact of Success:
 - Novelty: print a slag-based binder material
 - Combination of cutting-edge technology, innovative design and sustainable materials
 - Printed material is performance based. Tackle prescriptive based criteria

Objectives/printing criteria:

Product development: obtain a suitable **rheology** and **stiffness** for 3D printing (high yield, thixotropy) that meets:

Pumpability
Extrudability
Buildability
Print Fe-rich slag-based objects
Minimum strength: 20 MPa in 2 days

Durability assessment

Deliverables

Material printed on large scale

Durability tests in report October 2020

Writing 2 journal papers

