



International Meeting of Doctoral  
Students in Civil Engineering



# 3D PRINTING OF ARTIFICIAL REEFS WITH SUSTAINABLE MORTARS

PhD: Adrián Isidro Yoris Nóbile

Supervisors: Elena Blanco Fernandez

María Josefina Positieri

Bárbara Belén Raggiotti

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**Formación transversal obligatoria**

**Evaluación favorable de su PI anual a lo largo de todo el doctorado**

**Publicaciones científicas internacionales**

**Movilidad internacional**

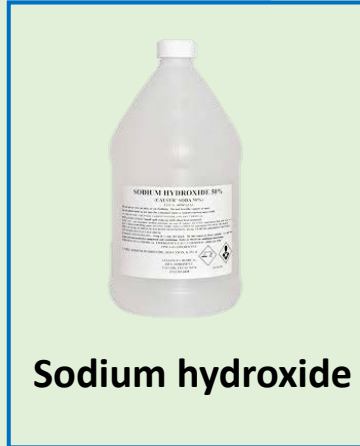


# Geopolymer mortars

## Binder



## Activator



## Fine aggregates



## Additive





# Cement mortars

## Binder



Two type of cement

## Adiciones



Fly ash



Kaolin

## Fine aggregates



Limestone sand



Glass sand



Seashell sand

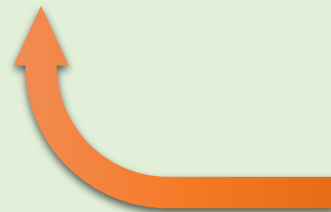
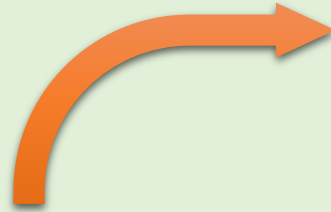
## Aditivos



Superplasticiser



# Printing tests

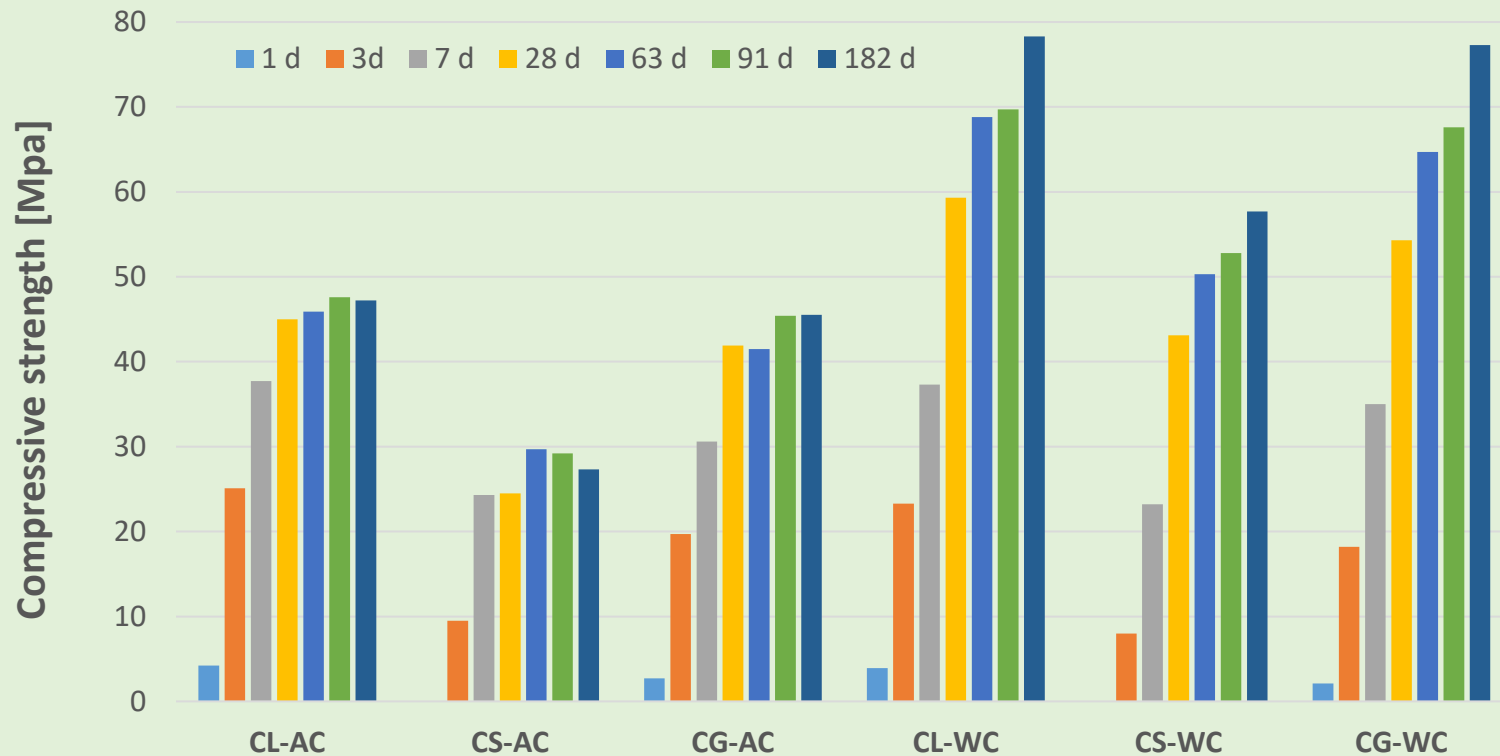


# Preliminary impressions



# Mechanical tests

## Cement mortars

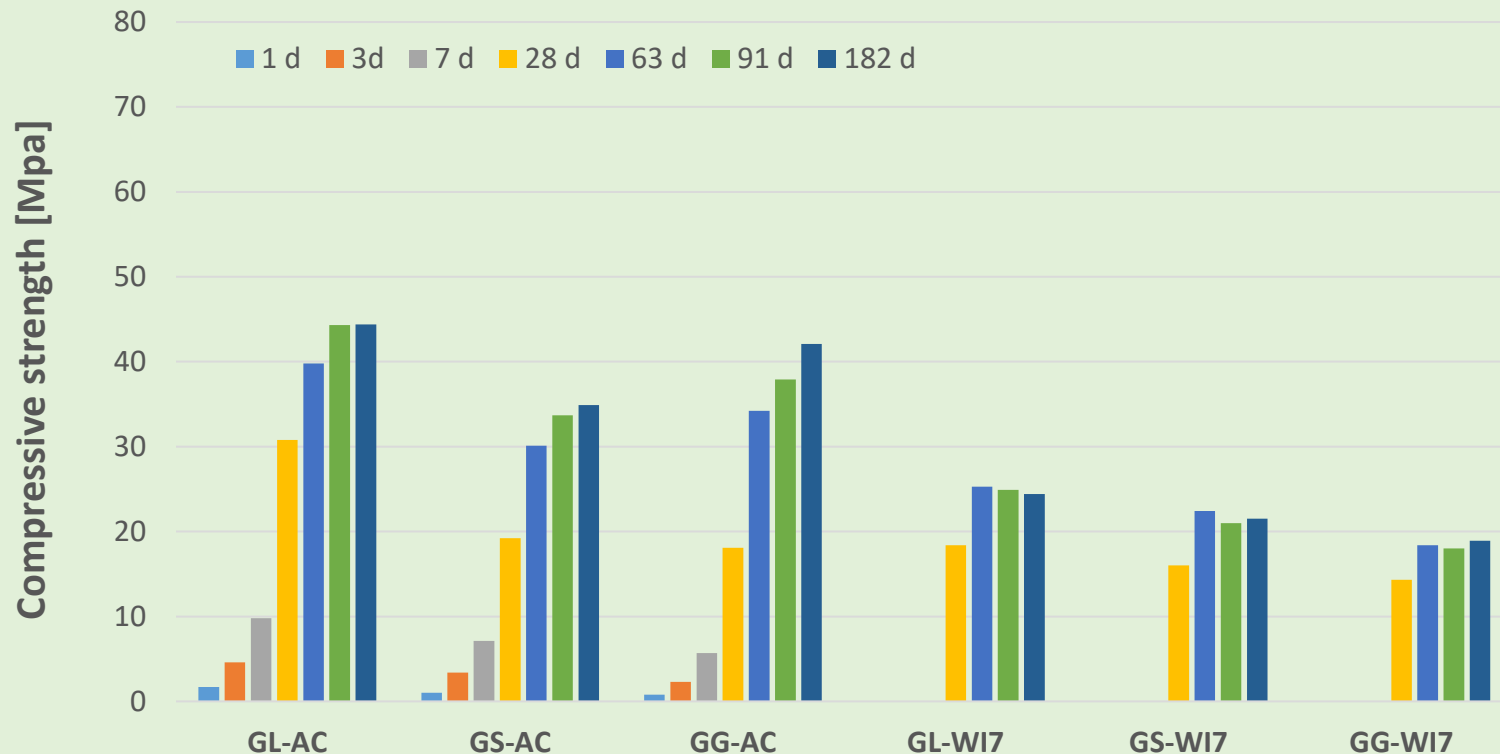


**CL:** Cement Limestone – **CS:** Cement Seashell – **CG:** Cement Glass  
**AC:** Air Cured – **WC:** Water Cured



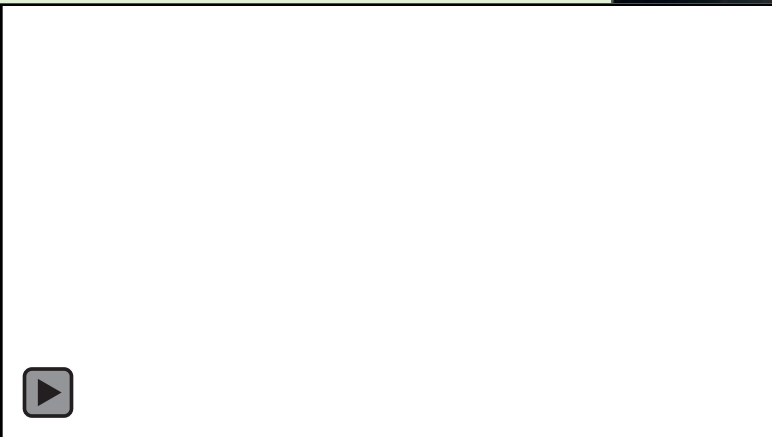
# Mechanical tests

## Geopolymer mortars



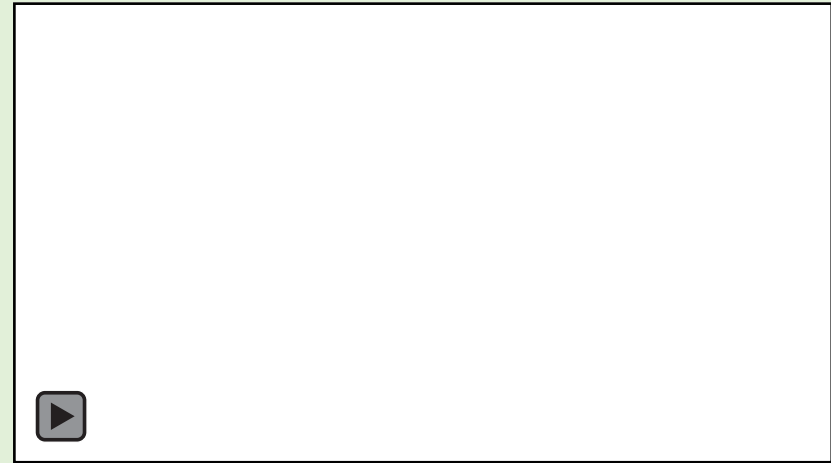
**GL:** Geopolymer Limestone – **CS:** Geopolymer Seashell – **CG:** Geopolymer Glass  
**AC:** Air Cured – **WI7:** Water Immersion after 7 days

# Printing of artificial reefs



# Immersion of artificial reefs

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**END OF THE  
NEXT YEAR**



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