

Description of Funded Research Projects

1st Call for H.F.R.I. Research Projects
to support Post-Doctoral Researchers

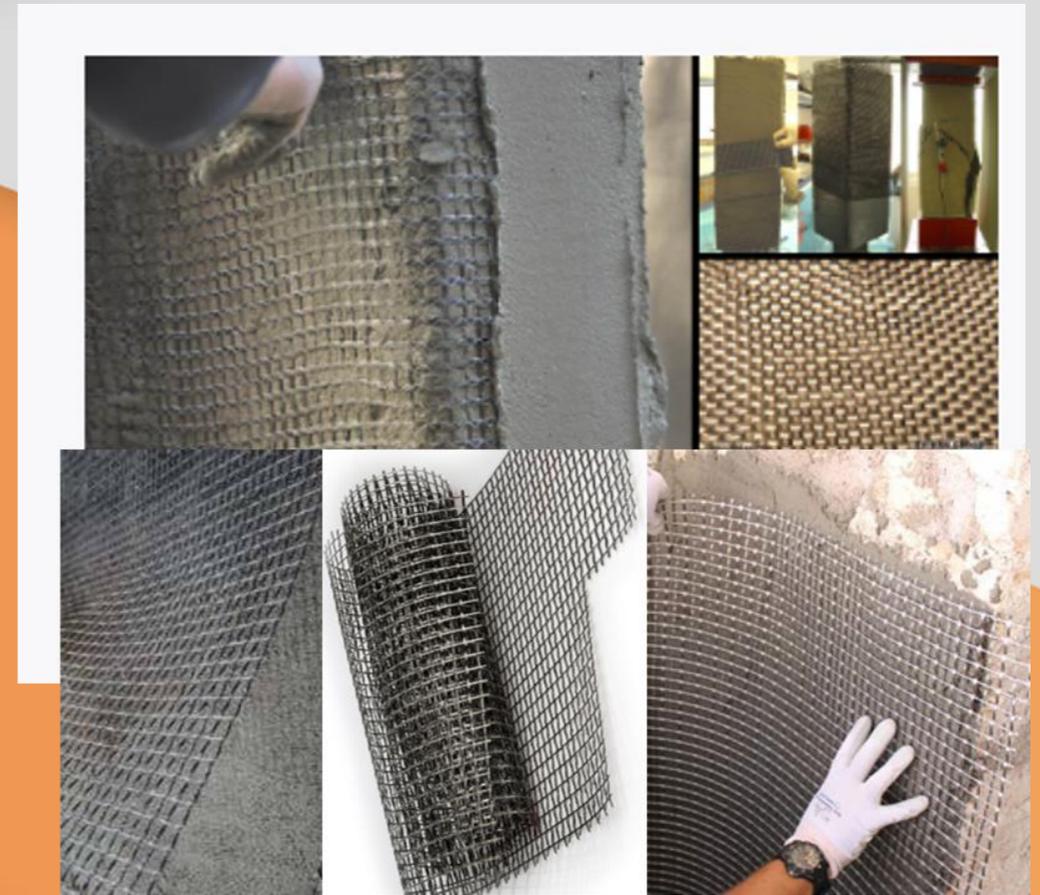


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Research Project Title:

**A Systematic investigation of the
Durability of Textile Reinforced
Mortars (TRM) and of TRM/RC
elements under harsh
environments**

Principal Investigator:
Sotiris Demis



Popular Title:
**Durability of composite materials for
structural strengthening**

Scientific Field:
**Engineering and Technological
Sciences**

Host Institution:
**University of Patras, dep. of Civil
Engineering**



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The increasing need for retrofit and repair of existing reinforced concrete (RC) structures, has urged the international research community to develop innovative structural components and techniques, aiming to increase their strength and/or deformation capacity. In this direction, innovative composite materials, comprised of high strength textiles in inorganic matrices, named textile reinforced mortars (TRM), have been introduced as an alternative to the traditionally used FRP systems, in the field of strengthening and seismic retrofitting. Since on any strengthening application, the TRM will be applied on the external surface of an existing RC element, exposed to a particular harsh environment (e.g. chlorides, carbon dioxide, etc.), the long-term performance of both the TRM and the TRM strengthened RC structure (noted as “TRM/RC”) should be considered, in terms of structural durability. Even though research on TRM in terms of strengthening applications and techniques is currently at quite an advanced stage, limited data are available in literature concerning TRM durability and long-term performance in various exposures.

In this research project, analytical investigation of the durability of TRM and TRM/RC element will take place, to generate performance data under long-term exposure in a variety of aggressive agents for both the TRM and the TRM/RC structural element, aiming to develop TRM composite materials of proven durability performances for strengthening applications in urban and coastal environments, to further prologue the service life of the RC structure.

Achievement of the main aim and objectives of DuraTRM is directly translated to considerable benefits on society and economy. Being able to develop a durable TRM composite material that will be applied on strengthening applications of reinforced concrete elements, exposed in urban and coastal environments, the element structural performance is upgraded and also its service life is substantially prolonged. Considering the shift in the European construction sector from new construction to renovation/rehabilitation of existing structures (translated to over 50% of the total construction output of around €330 bn), technologies that contribute to a durable and long-term lasting strengthening solution, will reduce structural maintenance costs. In addition, such solutions indirectly introduce a level of structural safety on society, a 'peace of mind' for occupants, who know that their structure will be able to resist both mechanical and environmental challenges in the future.

To me, H.F.R.I. funding
would mean...

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In a few words it means that I've got the opportunity to engage in high quality research in my country, on my field of expertise and produce knowledge, results, technologies and knowhow, that will benefit not only construction but society in general. It means that I now have the option, the means and the necessary support to “drain” my brain in my country, thus giving another meaning to the “brain-drain” definition.

*The Principal Investigator,
Sotiris Demis*

Funding

Amount: **116,500 €**

Duration: **36 months**

Foundation: **H.F.R.I.**





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