



UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA

Department of Engineering “Enzo Ferrari”
Via P. Vivarelli, 10 – 41125 Modena (MO)

SEMINAR ANNOUNCEMENT

Thursday, 3rd April 2025

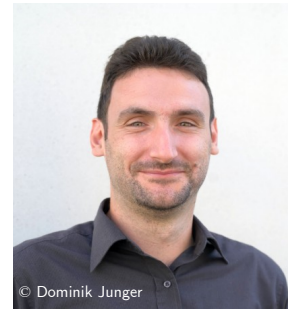
10:00 – 11:00

Room P0.5 (ex FA-0D)

Innovative composites for structural protection: *upside-down vision of durability concepts*

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ABSTRACT

Structural protection has a critical role to play in an era where the effects of climate change and warfare are unfortunately impacting our built environment and raising critical safety concerns. Innovative materials and technologies are at the forefront of structural protection, with the dual purpose of maintaining structural integrity while ensuring and prolonging the serviceability of existing buildings and critical infrastructure. The ongoing, albeit slow, epocal transition from metallic to non-metallic reinforcement in cement-based materials has marked a fundamental turning point in our view of traditional durability concepts. In fact, while thinking of steel reinforcement is immediately associated with corrosion protection, and thus the preservation of the highly alkaline environment of Portland cement, the use of synthetic fibres, bars and textiles is opening up avenues towards more sustainable alternatives for new blended binders with reduced pH, thus contributing to the reduction of global greenhouse gas emissions. More remarkably, normally undesirable phenomena that reduce the alkalinity of cement binders, such as carbonation, turn out to be a promising curing strategy to improve the durability of the composite. The focus of this presentation is on the performance and durability based design of green Fibre Reinforced Cementitious Composites (FRCCs) with extremely high toughness, including low emission blended binders with up to 75% cement substitution and low grade recyclable synthetic fibres. We will learn how carbonation could become a valuable ally in the long-term preservation of the mechanical properties of such FRCCs.