

Research subjects proposed – XXXIII cycle

Curriculum: *3. Modelling and Simulation*

Title: "Behaviour of cold formed steel industrial storage racks subjected to accidental and seismic actions"

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Synthetic description of the project and research outcome:

The project will focus on the response of pallet racks under accidental actions, and aims at developing suitable design models and simplified methods. In particular, the project intends to develop new and improved technical solutions to enhance the robustness of steel storage rack systems under accidental loading, e.g. impact, overloading, blast, earthquakes, which are able to generate localized failures with potential to generate progressive collapse. Redundant structural solutions and robust detailing will be investigated. Vulnerability analyses and risk assessment will be applied to define performance criteria for selected Pallet Rack Storage.

The project combines the experimental and numerical analyses.

The experimental study will focus on components (elements, connections and subassemblies) as well as on 3D full scale frames.

Numerical models will be then set up and validated enabling the various phenomena characterizing the performance of these structural systems to be caught.

As a final outcome: a simplified design approach would be established.