MULTIOBJECTIVE OPTIMIZATION OF STEEL CONCRETE FILLED-TUBE COLUMNS BASED ON SIMULATED ANNEALING: FUNCTIONAL, ECONOMIC AND ENVIRONMENTAL OBJECTIVES

A. Piquer *, D. Hernandez-Figueirido *, A. Hospitaler † and JM. Portoles *

* Departamento de Ingeniería Mecánica y Construcción
Universitat Jaume I
Av. Sos Baynat s/n, 12071, Castellón de la Plana, Spain
e-mail: Ana.Piquer, hernandd, porto@uji.es,

† Departamento de Ingeniería de la Construcción y Proyectos de Ingeniería Civil.
Universidad Politécnica de Valencia.
Camino de Vera s/n, 46022, Valencia, Spain
e-mail: ahospitaler@cst.upv.es

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Summary. Nowadays steel concrete-filled tube structures (SCFT), circulars and rectangular, are being used in more countries. These structures give some advantages in front of traditional reinforced concrete or steel structures. The main aim of this article is to pursue an optimal section and also optimal configuration of them: section, materials, rebar,... as environmental criteria: minimum CO₂ emission embebed, energy consumed; economic criteria: minimum cost of materials and execution; and functional criteria too: minimizing the area and weight, maximizing fire resistance and durability of the column. SCFT are designed following the European Standard of composite structures: Eurocode 4:2004. There are 13 discreet variables and a total of 7.96·10^{10} solutions. Simulated Annealing is used to optimize multiobjective problem and Pareto’s frontier to find the optimal solution.