

Topology Optimization of Structures with Web-Openings

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Abstract : Topology optimization technique utilizes constant element densities as design parameters. Finally, optimal distribution contours of the material densities between voids (0) and solids (1) in design domain represent the determination of topology. It means that regions with element density values become occupied by solids in design domain, while there are only void phases in regions where no density values exist. Therefore the void regions of topology optimization results provide design information to decide appropriate depositions of web-opening in structure. Contrary to the basic objective of the topology optimization technique which is to obtain optimal topology of structures, this present study proposes a new idea that topology optimization results can be also utilized for decision of proper web-opening's position. Numerical examples of linear elastostatic structures demonstrate efficiency of methodological design processes using topology optimization in order to determinate the proper deposition of web-openings.

Keywords : topology optimization, web-opening, structure, element density, material

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