

## Investigations on the Seismic Performance of Hot-Finished Hollow Steel Sections

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**Abstract :** In seismic applications, hollow steel sections show, beyond undeniable esthetical appeal, promising structural advantages since, unlike open section counterparts, they are not susceptible to weak-axis and lateral-torsional buckling. In particular, hot-finished hollow steel sections have homogeneous material properties and favorable ductility but have been underutilized for cyclic bending. The main reason is that the parameters affecting their hysteretic behaviors are not yet well understood and, consequently, are not well exploited in existing codes of practice. Therefore, experimental investigations have been conducted on a wide range of hot-finished rectangular hollow section beams with the aim to providing basic knowledge for evaluating their seismic performance. The section geometry (width-to-thickness and depth-to-thickness ratios) and the type of loading (monotonic and cyclic) have been chosen as the key parameters to investigate the cyclic effect on the rotational capacity and to highlight the differences between monotonic and cyclic load conditions. The test results provide information on the parameters that affect the cyclic performance of hot-finished hollow steel beams and can be used to assess the design provisions stipulated in the current seismic codes of practice.

**Keywords :** bending, cyclic test, finite element modeling, hollow sections, hot-finished sections

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