



# Standardized Seismic Design of Modular High-rise Steel Structure Equipped with Viscous Dampers

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## Abstract

Standardization is the key word of modular building, which requires modular building to have strong flexibility and replicability in engineering. Only by standardizing housing modules can factory assembly line production be realized. For modular buildings, buildings with similar functions often have similar height and load, and there is little difference in vertical load, while the difference of horizontal load in different sites can be huge. In order to realize the standardized construction of multi-intensity sites of modular houses, it is necessary to make the structural responses of different sites the same without changing the main structure. Based on the above background, a standardized design method for multi-intensity site damping of modular steel structures based on viscous dampers (VD) is proposed in this paper. The additional damping of the structure is increased by arranging viscous dampers to reduce the seismic response. In order to realize the construction of standard modular steel structure at different intensity sites, the automatic calculation of structural target additional damping ratio and the automatic design of viscous dampers are realized by coding design program. The optimal parameters, quantity and location of viscous dampers for different intensity areas can be obtained, and an actual high-rise modular steel structure engineering case is taken as an example to illustrate the correctness and applicability of this method.

**Keywords:** Modular structure; standardized design; viscous damper; seismic design.

## 1 Introduction

At present, the application of modular steel structure buildings is generally in the single-story or

low-rise stage, but in the face of the increasing shortage of urban land, modular steel structure buildings urgently need to develop to high-rise buildings. In China, seismic design is one of the key