

Fire Safety Analysis of Plastic Steel frames

**ZHANG Rong-gang^{1, 2, *}, ZHANG Hong-tao³, BAI Yu-xing³, GAO
Jian-ling³, ZHANG Lai-yong², XU Bing-ye¹**

Summary

Based on the upper bound theorem, the fire resistance is studied using the combination of element collapse mechanisms of steel frames, where the element collapse mechanisms are automatically determined from independent mechanisms. The fire limit load is calculated by solving a nonlinear mathematical programming. The computing procedure is programmed by FORTRAN language. Results show that this method is useful to find the collapse mechanism with the lowest fire limit load, which can provide a theoretical and practical way for the fire design of steel frame structure.

