عنوان مقاله:

Flat steel resistant doors' optimization by employing inner stiffening profiles in industrial spaces

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خلاصه مقاله:

It is essential to protect the country's vital infrastructure and achievements, which have been built at great expense. Special equipment in the oil and petrochemical industry are among these worthwhile national treasures threatened by various kinds of hazards, mainly such as explosions. One of the effective solutions to deal with this kind of threat in these industries and prevent the entry of explosion wave and reduce its effect is the use of blast-resistant doors. In this paper, the propagation of the wave in such industrial spaces and the effect of that on the blast-resistant doors made of inner stiffener profiles are studied by the ABAQUS Finite Element software simulation. In order to optimize these doors, the numbers, locations, material types, and dimensions of the inner stiffening profiles were investigated. The stiffness, strength and weight of the doors are the determinative variables to obtain the optimal conditions. During the study of these parameters and at each phase, by improving the performance and reducing the door's weight, the optimal door has been obtained. This study shows that utilizing ۴ rows of A۳۶ steel tubes with ۱۰ mm thicknesses and the ۸ mm back plate is the most appropriate one due to its higher stiffness and lower total weight compared with other models.

کلمات کلیدی:

Blast-resistant door, Explosion wave, inner stiffening profiles, industrial spaces.

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