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**Takács Lajos Gábor: Fire compartmentalization
Ph.D. dissertation**

Summary

According to my research work, the following reasons require a new understanding of the separation and construction of fire compartments, which will further lead to a new set of conclusions:

- Rapid increase of the fire load of rooms, fire compartments and buildings due to the widespread usage of plastic items.
- Increasing fire hazard caused by changes in building traditions and by the introduction of new types of buildings.
- The introduction of new building materials, combustible building products and the dominance of dry constructions with fire performance qualities different from traditional building constructions.

My dissertation is based on research, design and expert jobs as well as on the involvement in drafting laws over the last 14 years. One of my most important findings was the extended application of the principle of the continuance of protecting surfaces to the design and the construction of fire barrier constructions.

I have restated the rules for designing basic fire barrier constructions (true fire walls, fire barrier walls, fire barrier floor slabs) by ways of deduction from their real fire performance. I have redefined the true fire wall according to the principle of the independent structural stability. By comparing Harmathy's "Ten Rules Of Fire Endurance Ratings" with up-to-date building constructions and building habits I reached the conclusion that Harmathy's rules – adjusted by my proposed stipulations – are still valid. Based on this analysis, I have proposed the continuance of fire protecting surfaces in multi-layer building constructions which is especially important in case of fire barrier constructions.

The most important summary of my research work is that the passive fire protection of a building – including fire compartmentalization – is only appropriate when the emergency egress and the evacuation is still possible even in the case of faults in the active and operative fire protection systems. Accordingly, the passive fire protection and the active (operative) fire protection systems are not unrestrictedly compatible. The limits of compatibility lie in the protection of human life: evacuation routes cannot only be protected with operative fire protection systems. In case of failures in the active and operative fire protection systems used as fire compartment separating constructions a building can even be operated without effective fire compartmentalization.

The most important fire protecting tools of the accessible buildings are the fire compartments and the protected areas separated with fire barrier constructions. In my dissertation I have classified the alternative arrangement methods in these accessible buildings and I have made proposals with regard to their utilisation.