# Compensation for Missing Fire Partitions by Water Mist

Beihua Cong[1]
Shanghai Tongtai Fire & Security Technology Co.,Ltd, Shanghai, China,
congbeihua@tongtai-sh.com
Bio[1]: Dr Beihua Cong has got 20 years' experience working with comprehensive fire prevention, fire risk evaluation and fire suppression systems. He is now general manager of Shanghai Tongtai and he is also a professor in Tongji University. He has published 100 research papers (30 included in SCI/EI). He is one drafter for China water mist standards.

Abstract
[*Background*] For some specific environment and conditions, installation of fire partitions become a challenge, e.g. due to overhead line system, it is difficult to install roller shutter in metro vehicle depot. e.g. modern buildings are designed openly by using glass and steel structure, which made fire prevention a challenge. e.g. Heritage villages feature narrow streets, there is no enough safety distance between houses on both sides. Usually sprinklers are used to produce a water curtain, however the large water consumption normally causes damage to cultural heritages, while water mist with low water consumption is valued as an alternative technology. [*Objective*] The main purpose is to verify that the water mist curtain can be used as a fire partition measure, which can effectively block fire spreading, block heat radiation, block the smoke spreading, and effectively reduce the temperature of the protected side. All performance is obtained through full-scale fire tests and data acquisition analysis. [*Methods*] Series of full-scale fire tests were carried out in Shanghai Tongji Antai Fire test center and witnessed by AHJ, the tests were performed in a tunnel, dimensioning 100m(L) x 12.75m(W) x 6.7m(H), with heat release rate of 3MW as fire test source. [*Results*] The results indicate that before water mist curtain activation, the temperature at fire rapidly increased. After the water mist curtain was started, the temperature at the fire source still rose and stabilized, while the temperature on both sides of the water mist curtain decreased, especially on the protected side. After the water mist started, neither the temperatures at the curtain nor the temperature on the protected side exceeded 180 degrees C. The study also shared some real cases of water mist curtain used for fire partitions. [*Main conclusions and recommendations*]. Water mist is a valuable optional as fire partitions due to high efficient cooling, heating blocking, less water using and non-conductive. Water mist partition can also block smoke spreading to improve conditions of evacuation and emergency service, it is an effective measure to protect property and life safety. We call for more researches, applications and related codes and specifications to be produced.

Keywords: water mist curtain, fire partition, fire separation, smoke separation, cooling, heat blocking