細水霧與撒水頭在機械空間的滅火性能比較

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摘要

本文主要是根據 FMRC 對於機械空間的火場測試要求來進行，一系列通風條件下機械空間的防護測試。本文中設計了兩種火源：(1) 遮蔽火源實驗 (2) 無遮蔽火源實驗，在遮蔽火源實驗的結果顯示，無論是傳統撒水防護或高壓細水霧實驗中，火源均能被撲滅，但其所需的時間顯示高壓細水霧滅火系統而更有效的將火給撲滅。在顆及 4 顆高壓噴頭實驗中，其所需的滅火時間分別為 44 秒及 73 秒。另外，在用水量方面，6 顆及 4 顆細水霧噴頭所需的用水量分別為 23.21 公升及 25.01 公升，結果顯示噴頭數量的增加不一定會增加用水量。而在無遮蔽火源的實驗結果中顯示，在該測試條件下，使用 4 顆高壓噴頭有遮蔽/無遮蔽火源實驗中，滅火所需的時間分別為 73 秒及 89 秒。當增加為 6 顆時，所需的時間分別為 44 秒及 40 秒。其結果顯示，遮蔽物對於該測試條件下的高壓細水霧滅火性能沒有太大的影響。

關鍵字：機械空間、高壓細水霧

Comparative Studies on Fire Suppression Performance of Water Mist and Conventional Sprinkler in Machinery Space

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Abstract

A series of full-scale fire tests subjected to various fire protection systems under natural ventilation condition are carried out based on the test standard of machinery space by FMRC fire test protocol. Two fire source scenarios, which are shielded and unshielded pool fires, respectively, are used. In the shielded pool fire tests, the results show that the pool fire can be extinguished by the conventional sprinkler and high-pressure water mist suppression systems. However, the extinguishing time for conventional sprinkler protection system is longer. For 6-nozzle and 4-nozzle tests in the water mist system, they take 44s and 73s as well as 23.21 L and 25.01 L of water quantity to extinguish the shielded pool fires, respectively. For the comparison between shielded and unshielded pool fire tests, the extinguishing times for the use of 4-nozzle are 73s and 89s, whereas they are 44s and 40s for 6-nozzle. Apparently, the obstruction seems to have no obviously influence on the fire suppression effectiveness.

Key words: machinery space, high-pressure water mist system.