

Early Suppression Fast Response (ESFR) Sprinkler Systems are being used extensively in major industrial and commercial high risk properties. Metal Building Systems are extremely suitable when ESFR systems are required. For 35-foot high storage applications, many buildings exceed the 40-ft ceiling limitations of ESFR Sprinklers. The MBMA conducted extensive tests at Factory Mutual that show 45-ft ceiling heights are acceptable under these conditions:

Type of Storage	Commodity	Maximum Height Of Storage ft (m)	Maximum Height Of Building ft (m) (Note 1)	Nominal K Factor	Sprinkler Design Pressure psi (bars)	Commodity Limitation
Single-, double-, and multiple-row rack storage (No open-top containers or solid shelves)	Cartoned unexpanded plastic; cartoned expanded plastic; uncartoned unexpanded plastic; and Class I, II, III, or IV commodities, encapsulated or unencapsulated.	25 (5.6)	30 (9.1)	13.5 - 14.5	50 (3.4)	—
	Cartoned unexpanded plastic and Class I, II, III or IV commodities, encapsulated or unencapsulated	35 (10.7)	40 (12.2)	13.5 - 14.5	75 (5.2)	Note 2
		20 (6.1)	25 (7.6)	11.0 - 11.5	50 (3.4)	
		35 (10.7)	45 (13.7)	13.5- 14.5	90 (6.2)	
		40 (12.2)	45 (13.7)	13.5- 14.5	90 (6.2)	Note 3

Note 1: (no change)

Note 2: (no change)

Note 3: Install one level 17/32-in quick-response in-rack sprinklers located at the tier height closest to one-half the storage height. Location of the in-rack sprinklers shall be at the intersection of longitudinal and transverse flue spaces, with the spacing between sprinklers and lines of sprinklers not exceeding 5 ft (1.5 bar). For multiple-row racks, in-rack sprinklers shall be installed at every longitudinal and transverse flue intersection. Hydraulic calculations shall include eight in-rack sprinklers at 50 psi (3.4 bar) added to the ceiling demand.