

U.S. Fire Administration / National Fire Academy

*Coffee Break Training***Topic: Heat Detector Spacing**

Learning objective: The student shall be able to determine the heat detector spacing adjustment for ceilings from 10 to 30 feet (3.05 to 9.14m) high.

Spot-type heat detectors are listed for specific spacing arrangements, depending upon their performance during controlled testing. Common spacing limitations include smooth ceiling areas of 15' x 15' (4.57 x 4.57 m), 25' x 25' (7.62 x 7.62 m) or 50' x 50' (15.2 x 15.2 m). These spacing requirements are based on a test ceiling height of 15' 9" (4.8 m) and a room in which there is little air movement.

NFPA 72, *The National Fire Alarm Code*[®] – as well as manufacturers' listing data – provides a table for adjusting spacing based on taller ceilings. Generally, for every increase in ceiling height, the spacing between detectors must be reduced. The potential outcome is the installation of more detectors in the same floor area.

The following table provides the basis for the adjustments.

Ceiling Height Above		Up to and Including		Multiply Listed Spacing by
ft	m	ft	m	
0	0	10	3.05	1.00
10	3.05	12	3.66	0.91
12	3.66	14	4.27	0.84
14	4.27	16	4.88	0.77
16	4.88	18	5.49	0.71
18	5.49	20	6.10	0.64
20	6.1	22	6.71	0.58
22	6.71	24	7.32	0.52
24	7.32	26	7.93	0.46
26	7.93	28	8.54	0.40
28	8.54	30	9.14	0.34

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Example:

A heat detector is listed to protect an area measuring 18' x 18' (5.49 x 5.49 m), or 324 ft² (30.14 m²). What is its adjusted spacing for a ceiling that is 18 feet (5.49 m) high?

$$18' \times 0.64 = 11' 6''$$

$$5.49 \text{ m} \times 0.64 = 3.78 \text{ m}$$

The adjusted coverage area would be 11' 6" x 11' 6", or 132.25 ft² per detector. In SI units, the adjusted coverage would be 14.3 m².

For additional information, refer to NFPA 72, Chapter 5.