

QUICK RESPONSE REDUCTION

A USER'S GUIDE

#1

US

SI

QUICK RESPONSE REDUCTION

#2

GIVEN / ASSUMED

Edition of NFPA 13 Used
By Jurisdiction

2025

 A_o Initial Remote Area Size
Given1500 ft²

Wet Pipe System?

Yes

No

Light or Ordinary Hazard?

Yes

No

Any unprotected ceiling pockets (as allowed)
exceeding 32 ft²?
See NFPA 13 2025 10.2.10 and 11.2.7

Yes

No

Any unprotected areas above cloud ceilings?
See NFPA 13 2025 9.2.7

Yes

No

 h Ceiling Height
Given

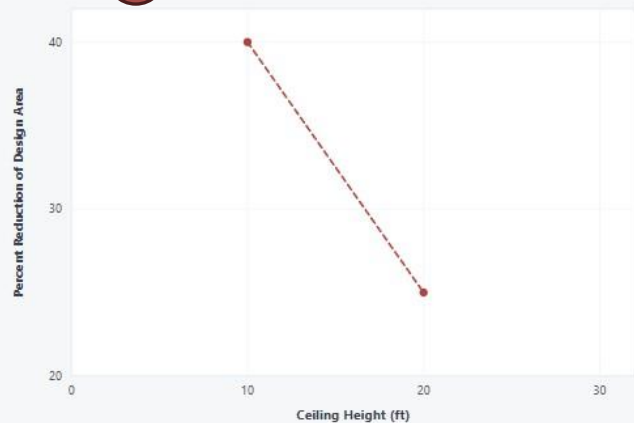
21

0

ft / in

#3

QUICK RESPONSE AREA REDUCTION



#4

QUICK RESPONSE REDUCTION

%RED

Percent Reduction to Design Area

 $\%RED = -3h / 2 + 55$
NFPA 13 2025 Fig. 19.2.3.2.3.1

0 %

 A_{RED}

Reduced Design Area

 $A = (100 - \%RED) / 100 \times A_o \Rightarrow [100 - (0)] / 100 \times (1500)$
NFPA 13 2025 Fig. 19.2.3.2.3.11500 ft² L Minimum Length of Area Along 1st Branch
Pipe $L = 1.2 \sqrt{A} \Rightarrow 1.2 \sqrt{(1500)}$
NFPA 13 2025 28.2.4.2.1

46.5 ft

#5

RESULT

Reduced Design Area

1500 ft²

No reduction (0%). Ceilings above 20 ft are not eligible for the quick-response reduction.

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#6

Reset

Print

DESCRIPTION

PURPOSE: The Quick Response Reduction tool calculates the design-area reduction permitted for quick-response sprinklers under NFPA 13. It (1) determines the percent reduction to the design area from the ceiling height, (2) confirms the conditions that allow the reduction (wet pipe, light or ordinary hazard, and no unprotected ceiling pockets or cloud-ceiling areas), and (3) reports the reduced design area and the minimum length of that area along the first branch line. The tool supports US/SI units and a printable one-page report.

#1 UNITS: Toggle between US customary units (ft, in, ft²) and SI units (m, m²). Every input, result, and the chart converts instantly based on the selection.

#2 GIVEN / ASSUMED: The design conditions that determine whether the reduction applies and by how much. Select the Edition of NFPA 13 used—the referenced figures and section numbers update to match. Enter the Initial Remote Area Size (A_0), the design area before any reduction, default 1,500 ft² (139 m²). Set whether the system is a Wet Pipe System, whether it serves a Light or Ordinary Hazard, and whether there are unprotected ceiling pockets over 32 ft² or (2016 and later) unprotected areas above cloud ceilings. Enter the Ceiling Height (h) in feet and inches (US) or meters (SI).

#3 QUICK RESPONSE AREA REDUCTION: The chart plots the NFPA 13 relationship — a 40% reduction at a 10 ft ceiling decreasing linearly to 25% at a 20 ft ceiling. The hollow circle marks your current ceiling height and its resulting percent reduction.

#4 QUICK RESPONSE REDUCTION: The calculated results, each with its governing NFPA 13 reference. %RED is the Percent Reduction to Design Area from the ceiling-height relationship (0% when the conditions above are not met, or when the ceiling exceeds 20 ft). A_{RED} is the Reduced Design Area, $A = (100 - \%RED) / 100 \times A_0$. L is the Minimum Length of the design area along the first branch line, $L = 1.2 \sqrt{A_{RED}}$.

#5 RESULT: The headline reduced design area. When the reduction applies, it shows the reduced area and the percent applied; when it does not, it states why — for example, not a wet pipe system, not a light or ordinary hazard, unprotected ceiling pockets or cloud ceilings, or a ceiling above 20 ft.

#6 RESET / PRINT: Reset returns every input to its default values. Print produces a clean one-page report of the inputs, chart, and results (Letter for US, A4 for SI).