

Special Hazard Systems

Symbol	Description	Equation	Source	Value	Units
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Problem Statement

A 40 ft long by 28 ft wide by 12.5 ft tall space contains high value historic newspapers in pervious metal storage. If the space is to be kept at 72 deg F and has fixed structures of 215 ft³, what minimum quantity of FM-200 agent would be required to protect the space in a full flood application if the design concentration is 6.7%?

- 417 lb
- 447 lb
- 536 lb
- 1367 lb

Given/Assumed

l	Length of Space	-	Given	40.0	ft
w	Width of Space	-	Given	28.0	ft
h	Height of Space	-	Given	12.5	ft
t	Temperature of Space	-	Given	72	deg F
V _{fixed}	Fixed Volume within Space	-	Given	215.0	ft ³
C	Design Concentration	-	Given	6.7	%

Solution

V	Net Volume of Space	$V = l w h - V_{\text{fixed}}$ $= (40)(28)(12.5) - 215$	Definition of Volume	13,785	ft ³
s	Specific volume of the agent	$s = 1.885 + 0.0046t$ $= 1.885 + 0.0046(72)$	SFPE 5th p 1512, NFPA 2001-2015 Table A.5.5.1(i), p70	2.22	ft ³ /lb
W	Agent Weight	$W = (V/s) [C/(100-C)]$ $= (13785 / 2.2162) [6.7 / (100-6.7)]$	SFPE 5th p1512, NFPA 2001-2015 Table A.5.5.1(i), p70	447	lb

References Used

1	SFPE	SFPE Handbook of Fire Protection Engineering, 5th Edition
2	NFPA 2001	Standard on Clean Agent Fire Extinguishing Systems, 2015 Edition

Tips & Notes

Questions like this (special hazard systems) make up about 8 questions (or 10%) of the exam.