

Study on the Life Cycle Cost of Portable Fire Extinguishers

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RJA undertook this project to determine the cost of portable fire extinguishers over their life cycle, estimated to be 24 years, including purchase, installation, and all service requirements. This analysis may be used to determine the value of portable fire extinguishers in commercial properties. The study methodology utilized the accepted international standard, *Standard for Measuring Life Cycle Costs of Buildings and Building Systems, ASTM E0917-05*. This analysis can be used to estimate the total economic impact of the provision of portable extinguishers in accordance with NFPA 10 in any size facility for any assumed rate of return. Here, the discount (interest) rate used is 5%, which is typical for equipment investment analyses.

Typical costs of procurement, periodic inspection, maintenance, and testing as required by NFPA 10 were obtained from publically available sources and include initial (or replacement) cost and costs associated with required on-site servicing. Required monthly inspections are assumed to be performed by employees at a typical loaded salary rate and annual maintenance, periodic recharge, and hydrostatic testing required to be performed by certified professionals is assumed to be done on site.

NFPA 10 requires that for Class A hazards, an extinguisher must be within a 75 foot travel distance of any point; which is not directly useful in assessing cost. Most cost estimating guides (e.g., Means) express costs in cost per square foot of floor area. To determine a reasonable value for number of extinguishers per floor area, the floorplans of a dozen health care facilities ranging in size from 33,000 sq. ft. to 560,000 sq. ft. and

requiring from 15 to 420 extinguishers, were examined. This resulted in a range of 1500 to 2000 sq. ft. per extinguisher. Note that NFPA-10 allows these extinguishers to cover no more than 6,000 square feet, so the cost per foot can vary significantly.

Actual inspection, maintenance and testing costs gathered for this study consist of a fixed service charge per facility per visit and a per extinguisher charge. To distribute the per visit charge over multiple extinguishers, costs per extinguisher were determined as 10% of the costs for 10 extinguishers per facility.

Because actual costs vary depending on many factors, including the facility size and geographic location, costs are reported as a range, following conservative assumptions in each case. Obtaining a cost per square foot was accomplished by using the actual number of extinguishers required in each health care facility divided by their gross floor area.

Based on the actual health care facility extinguisher location drawings, the annual cost per square foot for procurement, installation, and all required inspection, testing, and maintenance over a 24 year life (all paid at the time of purchase) ranged from \$.015 to \$.04 per square foot per year. If a facility was able to maximize extinguisher coverage at 6,000 square feet per extinguisher, the annual cost per foot would range from .005 to \$.01. While unlikely that any facility can achieve the maximum permitted coverage, this calculation is provided for comparative purposes.

