



Coffee Break Training - Fire Protection Series

Access and Water Supplies: Fire Flow Formulas: Part 11: Insurance Services Office Needed Fire Flow Formula: Occupancy Factor Examples

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Learning Objective: The student will be able to list some examples used in the Insurance Services Office (ISO) Needed Fire Flow (NFF) formula to describe the combustibility of contents.

The ISO NFF formula rates occupancy content combustibility into five major classes, C-1 through C-5. The combustibility rating provides guidance to the evaluator to rate the “occupancy factor” variable, O_i , in the NFF formula:

$$NFF_i = (C_i) (O_i) [1 + (X + P)]$$

The following table provides examples from ISO of occupancies and contents that fall within the various combustibility classes. ISO cautions that these examples are subject to field survey and verification.



The low combustibility of the operation and contents of this glassmaking facility would enable it to qualify as a Class C-1 occupancy in the Insurance Services Office (ISO) Needed Fire Flow (NFF) formula.

Occupancy Combustibility Class	Contents Category	Examples
C-1*	Non-combustible	Storage of asbestos, clay, glass, marble, stone or metal products, and some metalworking occupancies
C-2	Limited combustible	Banks, barber or beauty shops, clubs, residential occupancies, hospitals and offices
C-3	Combustible	Food markets and most wholesale and retail occupancies
C-4	Free-burning	Cotton bales, furniture and wood products
C-5	Rapid or flash burning	Ammunition, excelsior, mattress manufacturing, matches and upholsterers

*Any occupancy that contains enough combustible contents that a fire could threaten structural integrity, or the contents are so concentrated that a fire could spread beyond the vicinity of origin, may not be included in this combustibility class. Furthermore, the maximum amount of combustible materials in any 10,000 square feet (929 meters squared) of Class C-1 occupancies may not exceed 1,000 board feet (2.36 meters cubed) or 110 gallons (416 liters) of combustible liquids, greases or similar materials.

According to the ISO “Guide for Determination of Needed Fire Flow,” the maximum total area containing combustible material in an otherwise noncombustible contents occupancy (Class C-1) is 5 percent of the total area of that occupancy.

For more information on fire flow, you can take the National Fire Academy online class “Testing and Evaluation of Water Supplies for Fire Protection” (Q0218) at <http://1.usa.gov/12JypCa>. You can download the ISO “Guide for Determination of Needed Fire Flow” from www.iso.com.

