THE IMPACT OF INSULATION AND INTERIOR FINISHES ON FIRE INSURANCE RATES[1]

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The selection of the type of insulation and/or interior finishes is important as it will affect a building's construction class, the building and contents Loss Cost (LC) and the final insurance premium (Table 1). Care should be exercised as the use of certain wall materials will result in a lowering of the classification to Combustible-Frame and therefore an increase in the cost of insurance, regardless of the structural system of the building.

Combustible-Frame classification with higher insurance rates can be avoided. The most direct and easiest method is to use insulation and/or interior finish materials that are recognized as either noncombustible or slow-burning by ISO, other rating advisory organizations or individual insurance carriers.

Table 1: Comparison of Building and Content LC Rates by Wall Classification

Wall Classification	Building LC Rate	Content LC Rate
Noncombustible (metal panels, unprotected columns)	0.074	0.098
Combustible-Frame	0.092	0.115

Flame spread is the relative rate of flame propagation across a burning surface. It is most often measured by use of the ASTM E84 Steiner Tunnel Test. Results are compared on a scale where inorganic reinforced cement board is 0 and red oak is 100. The higher the flame spread number, the faster the spread of flame across the burning surface.

Noncombustible materials must have a 0.0 flame spread rating. To be classified as slow-burning, materials other than foam plastic insulation must have a flame spread rating of not greater than 25. Foam insulation having a flame spread of not greater than 25 is also classified as slow-burning if either of two requirements are met: (1) the foam insulation is fire-protected with materials having a 15-minute finish rating, such as 1/2-inch plaster, cement or gypsum board or other materials classified as having similar fire resistance; or (2) be part of field-fabricated or factory-manufactured assemblies that pass large-scale fire tests (such as NFPA 286 or UL 1715) when the foam insulation is exposed or fire-protected with materials such as intumescent paints or metal sheeting.

[1]The Metal Building Manufacturers Association (MBMA) provides these insurance bulletins as informational guides. The information contained in these bulletins is general in nature and is not intended to serve as legal advice. Readers are advised to consult with their own counsel and/or insurance broker on matters specific to them.

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Flame Spread and Smoke Development classes (Table 2) are determined by the ASTM E84 / UL 723 test protocols and are referenced in the International Building Code (IBC) and NFPA 101, the Life Safety Code.

Table 2: Flame Spread and Smoke Development Classes

Class	Flame Spread	Smoke Developed
I or A	0 to 25	0 to 450
II or B	26 to 75	0 to 450
III or C	76 to 200	0 to 450

Materials defined as combustible incur additional charges compared to noncombustible or slow-burning materials. Materials having high loss susceptibility may result in additional charges even if their flame spread rating is below 25. Final insurance rates will also be affected by the use of unprotected or unlisted insulation or interior finishes or those with flame spreads in excess of 25.

In addition to interior finishes, the contractor and the owner must consider how the interior of the building is going to be constructed. Metal building systems will normally be rated as Construction Class 3 - Noncombustible when low flame-spread insulation and finishes are used. The construction materials selected for interior partitions, offices and mezzanines will have an impact on the cost to insure the building.

The following example illustrates how this can occur. Proper and timely awareness of the impacts of building design and material selection on insurance classifications and rates can proactively lead to more efficient and cost-effective solutions.

Example: Differing Floor and Roof Materials

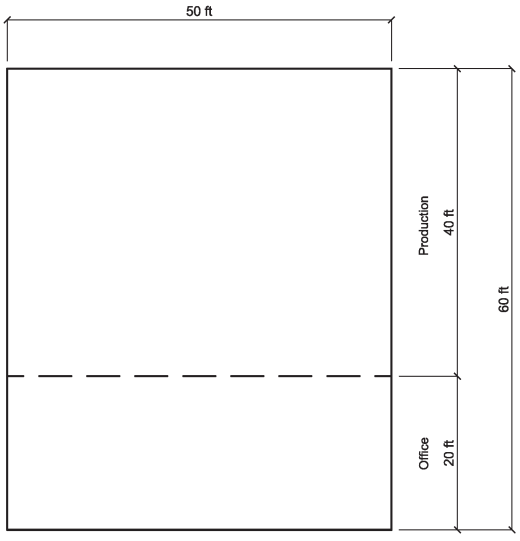

Figure 1: Original Building: 50 ft x 60 ft x 20 ft Construction Class 3 building, 1 story

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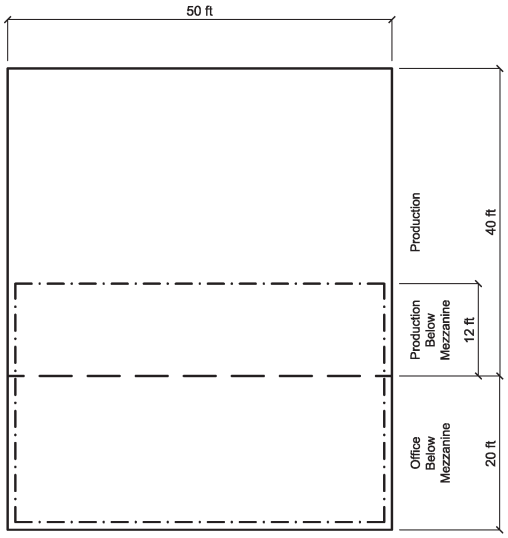

Figure 2: Modified Building: 50 ft x 60 ft x 20 ft building with 50 ft x 32 ft mezzanine

This structure was designed as a one-story, 3,000-square-foot (50-foot by 60-foot) building with 20-foot-high metal walls and a metal roof. The roof and walls were insulated with slow-burning insulation.

The front office area was gypsum wall board on metal studs. The owner needed more storage and requested that the builder add a 1,600-square-foot (50-foot by 32-foot) mezzanine over the one-story front office (50-foot by 20-foot) and extend the mezzanine 12 feet into the production area.

The mezzanine, 3/4-inch plywood on top of steel joists, is considered a combustible assembly. Prior to this change, the insurer determined that the building would be rated as Noncombustible Construction Class 3.

The change in the size of the mezzanine altered the construction class of the building due to the presence and amount of the plywood floor sheathing used as well as the percentage of mezzanine area to floor area. Insurers treat mezzanines as minor construction features; the area is not included in determining the total area or height if it is less than 25% of the floor area below. The presence of a combustible mezzanine can affect the insurance rating calculations. In this case, the area is large enough that it is considered as an additional floor (story) even though the height of the building has not increased.

Since the exterior walls are all noncombustible metal with low flame-spread insulation, they are disregarded in the determination of a change to the construction class as they have not been modified. The insurer will instead look at the total of the floor and roof areas. It should be noted that the lowest floor's area is not counted as part of this calculation. Therefore, the determination of construction class is based only on the combination of the (new) floor area and roof area (Table 3).

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Table 3: Determination of Construction Class Calculation

Total 2nd Floor (mezzanine) and Roof Area (50 ft x 32 ft) + (50 ft x 60 ft)	4,600 square feet (100%)
Combustible Floor Area (50 ft x 32 ft)	1,600 square feet (35.5%)
Noncombustible Roof Area (50 ft x 60 ft)	3,000 square feet (65.5%)

According to the ISO Commercial Lines Manual, if the roof and floor area of a building is 66.7% or more noncombustible, the rating will not be downgraded. But in this example, the combustible floor area makes up more than the allowable 33.3% maximum for these structural elements and so the construction class will change to Construction Class 1 Frame. If the combustible storage area had been a few feet smaller in area, the construction class would not have dropped to a Class 1 but would have been entitled to retain its less expensive Class 3 designation.

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