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Felt Tips

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FIRE RATED ACOUSTICAL CEILING ASSEMBLIES

1. Assembly - A fire rated ceiling is not just a ceiling itself but is an entire assembly which includes the acoustical material, the lighting fixtures, the air duct penetration, the depth of the plenum, the structural components, whether they be bar joists or beams and the floor or the roof construction.

2. The Grid - The grid used in fire rated ceiling systems is different from grid used in non-rated ceiling construction. A fire rated ceiling grid is designed to expand and not distort under extreme heat. This is so that the acoustical panels will remain in place in the grid assembly for as long as possible. A standard grid will twist and contort due to heat permitting the panels to drop out causing rapid heat transmission into the plenum and thus failure of the assembly.

3. Duct Penetration - There are limitations in both the number and size of duct penetrations that a fire rated assembly may have. Until recently the limitation was approximately 110-113 sq. in. of opening per 100 sf of ceilings. Within the last several months this has been drastically changed through testing and interpretations by the Underwriters' Laboratories. This change will give a greater degree of flexibility to both the mechanical engineer and the architect than he had before.

4. Lighting Fixtures - When recessed lighting fixtures are used in a fire rated assembly provisions must be made for the reduction in heat transmission through the fixture housing into the plenum. This transmission can be reduced by one of three ways, (a) a box constructed of acoustical materials and placed over the fixture (b) acoustical material propped up on both of the long sides of the fixture to form a tent type of assembly (c) a piece of flat 2' x 4' acoustical board laid on the top of the recessed 2' x 4' fixture by using two spacer strips.

5. Plenum Air Flow - Return air plenums do have an effect upon fire rated ceiling assemblies and this is a condition which cannot be specifically tested at Underwriters' Laboratories. Manufacturers have conducted research in the past several years and have concluded that when return air plenums are used, the assembly will have a 20% reduction in effectiveness. This means that you must determine from the manufacturer the length of time that his assembly ran if he has a 2 hour rating his assembly might have been run from anywhere between 120 and 180 minutes. When time is determined you would reduce the overall time that the test ran by 20% and, if this reduction still brought it above 120 minutes you could safely use the return air plenum and still be assured of having a 2 hour assembly.