

FIRE RATING

“Coreslab” hollowcore plank by Coreslab carries a 1 hour fire rating in all applications by passing the test requirements set forth by ASTM E-119 as performed by U.L. Laboratories (Note 1). Criteria for “Coreslab” to carry a 2 hour fire rating is found in chapter 7 of the International Building Code 2000, Sections 703.3 and 720. Key criteria include equivalent slab thickness, concrete cover over the strand, type of aggregate used and end bearing conditions being restrained or unrestrained.

Equivalent slab thickness is determined by dividing the net cross sectional area of the slab by the width of the slab (IBC720.2.2.1.1). Below is a table showing the equivalent thickness of “Coreslab” plank:

“Coreslab” Thickness	Cross Sectional Area Including Grout in Joints	Equivalent Thickness Bare Unit (Overlays will increase equivalent thickness)
6"	186.0 in ²	3.89 in
8"	240.0 in ²	5.00 in
10"	257.2 in ²	5.37 in
12"	290.9 in ²	6.08 in

Minimum Slab Thickness, Equivalent Thickness (in) for Fire Resistance Rating of Table 720.2.2.1 (IBC 2000)					
Concrete Type	1 hour	1 1/2 Hour	2 Hour	3 Hour	4 Hour
*Siliceous	3.5	4.3	5.0	6.2	7.0
Carbonate	3.2	4.0	4.6	5.7	6.6
Sand-Lightweight	2.7	3.3	3.8	4.6	5.4
Lightweight	2.5	3.1	3.6	4.4	5.1
<i>*Standard “Coreslab” Plank</i>					

(Note 1) “Coreslab” does not carry a U.L. label. Tests were run on hollowcore of the same shape and composition as “Coreslab” plank.

Concrete coverage over the strand for standard “Coreslab” plank is 1 1/2" (see plank cross section dimensions in the load tables). Below is table 720.2.3(2) from International Building Code showing the required strand coverage for different fire ratings:

Concrete Aggregate Type	TABLE 720.2.3(2) Cover Thickness for Prestressed Concrete Floor or Roof Slabs (Inches) (From IBC 2000)									
	Thickness of cover (in) for Fire Resistance Rating of									
	Restrained (Note 2)					Unrestrained (Note 2)				
	1hr	1 1/2hr	2hr	3hr	4hr	1hr	1 1/2hr	2hr	3hr	4hr
*Siliceous	3/4	3/4	3/4	3/4	3/4	1 1/8	1 1/2	1 3/4	2 3/8	2 3/4
Carbonate	3/4	3/4	3/4	3/4	3/4	1	1 3/8	1 5/8	2 1/8	2 1/4
Sand Lightweight or Lightweight	3/4	3/4	3/4	3/4	3/4	1	1 3/8	1 1/2	2	2 1/4
<i>*Standard “Coreslab” Plank</i>										

(Note 2) Read further in this section for definitions or restrained and unrestrained assemblies.

ASTM E-119 TABLE X3.1
Construction Classification, Restrained and Unrestrained

I. Wall Bearing:

Single span and simply supported end spans of multiple bays:^A

- (1) Open-web steel joists or steel beams, supporting concrete slab, precast units, or metal deckingunrestrained
- (2) Concrete slabs, precast units, or metal deckingunrestrained

Interior spans or multiple bays:

- (1) Open-web steel joists, steel beams or metal decking, supporting continous concrete slabrestrained
- (2) Open-web steel joists or steel beams, supporting precast units or metal deckingunrestrained
- (3) Cast-in-place concrete slab systemsrestrained
- (4) Precast concrete where the potential thermal expansion is resisted by adjacent construction^Brestrained

II. Steel framing:

- (1) Steel beams welded, riveted, or bolted to the framing membersrestrained
- (2) All types of cast-in-place floor and roof systems (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor or roof system is secured to the framing members.....restrained
- (3) All types of prefabricated floor or roof systems where the structural members are secured to the framing members and the potential thermal expansion of the floor or roof system is resisted by the framing system or the adjoining floor or roof construction^Brestrained

III. Concrete framing:

- (1) Beams securely fastened to the framing membersrestrained
- (2) All types of cast-in-place floor or roof systems (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor or roof system is cast with the framing membersrestrained
- (3) Interior and exterior spans of precast systems with cast-in-place joints resulting in restraint equivalent to that which would exist in condition III (1), concrete framing.restrained
- (4) All types of prefabricated floor or roof systems where the structural members are secured to such systems and the potential thermal expansion of the floor or roof system is resisted by the framing system or the adjoining floor or roof construction^Brestrained

IV. Wood construction:

All typesunrestrained

^A Floor and roof systems can be considered restrained when they are tied into walls with or without tie beams, the walls being designed and detailed to resist thermal thrust from the floor or roof system.

^B For example, resistance to potential thermal expansion is considered to be achieved when

- (1) Continous structural concrete topping is used.
- (2) The space between the ends of precast units or between the ends of units and the vertical face of supports is filled with concrete or mortar, or
- (3) The space between the ends of precast units and the vertical face of supports, or between the ends of solid or hollowcore slab units does not exceed 0.25% of the length for normal weight concrete members or 0.1% of the length for structural lightweight concrete members.