



## Filling in the voids

Volume #7

## UL Fire Rating

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Have you ever arrived home from a shopping trip, unpacked your new toaster or microwave and noticed the small UL label or symbol? Did you know that since 1894 Underwriters Laboratories has conducted a multitude of tests and published thousands of reports on everything from light bulbs to body armor? Their expertise seems to know no boundaries.

Underwriters Laboratories fire testing of building component and assemblies dates back to their earliest days just after the turn of the century. What they learned and the reports they published have saved countless lives. Based on that stellar reputation, construction documents often include a page (or several) of selected UL assemblies that the designer would like to see used. Never an arbitrary list, it may in part constitute the basis for establishing the building or construction type and therefore a specific fire resistance requirement for major building elements.

When it comes to hollow core plank, there are no less than 50 potential design numbers to choose from in the *Underwriters Laboratories Fire Resistance-Volume 1*. So how does one choose? More importantly how can one insure building code compliance? I think that last question is the one that causes the most confusion.

Without investigating exactly when, how, and why each individual test was undertaken, our understanding is that producers submitted their hollow core slab material for testing, often decades ago, with a target time (1 hour, 2 hours, etc.) for fire resistance they were seeking to have certified. Many of the design numbers show the name of the producer or producers along with other basic information, but two key details required by many building codes seem to be proprietary and therefore not disclosed by UL, coverage to the strand and equivalent slab thickness. Specific requirements for both exist in many building codes which are usually based on the Prestressed Concrete Institute Rational Method of Design for Calculated Fire Resistance.

Coverage to the strand is just what it sounds like, the distance between the slab bottom and the primary reinforcing. Equivalent slab thickness is calculated by taking the total unit depth and subtracting the area displaced by the voids. Typically there are tables in the appropriate code sections outlining requirements based on concrete/aggregate type and the number of hours of endurance for both criteria.

The reason it's difficult to comply with both a UL design number and the code is that neither really seems to acknowledge or compliment the other. After all, coverage and equivalent thickness aren't specified in the UL assemblies, and codes typically don't call out the UL as a method for rating prestressed elements. So where does that leave us?

For some years now, our internal (and external) guidance has been to recognize the UL assembly spec to ascertain the number of hours shown, check the code data on the plans to be sure the two agree, and never trump the building code. In other words, the code is most important to comply with, secondly the plan code data on the drawings must clearly dictate the type of construction, and then we see how that matches, or not, with the UL designation that's part of the documents. It can be quite confusing and is by no means an exacting process. Frequently the three will not match. Clear as mud right?

You can't help but hold what UL has done for building material safety in the highest regard. However, a real lack of understanding about when, where, and how to choose a particular design number, combined with missing specifics on code mandated requirements, taken with manufacturers that either don't exist today or don't supply in a particular region, makes specifying hollow core fire resistance via UL number quite a challenge.

As always, we recommend consulting with your local producer and heading their advice. Industry specific knowledge is your best tool to craft a set of construction documents that you can feel confident are safe and code compliant when it comes to fire resistance.