

## New Tests Show Cellulose Insulation Increases the Fire Resistance of Walls

People who manufacture or install cellulose insulation are crowing over the results of recent fire resistance tests that show cellulose insulation in a wall cavity actually increases its fire resistance, often by a very substantial amount.

In tests performed at Omega Point Laboratories (Elmendorf, Texas) using the American society for Testing and Materials (ASTM) E119 protocols, wall sections insulated with cellulose proved to be up to 77% more fire resistant than uninsulated sections. Based on the test data, the laboratory reported: "The results from this test have shown that when cellulose insulation is installed in the stud cavity of a wood stud/gypsum wallboard wall assembly, the fire resistance is increased significantly when compared to an uninsulated wall." The test were sponsored by the Cellulose Insulation Manufacturers Association (CIMA).

"We think these test results are going to give cellulose some competitive advantages over fiberglass," says Mark Henderson, president of Nu-Wool company (Jenison, Michigan) and newly named president of CIMA. For example, insulation contractors who have been touting cellulose as an acoustical insulation for interior partition walls can now make the parallel claim that cellulose will inhibit the spread of flames. (See the related story on page 8.) Moreover, the test results should make it easier and cheaper for home builders to construct one-hour fire-rated walls using cellulose insulation (details below).

The Omega Point test walls were constructed using both 1/2-inch and 5/8-inch Type X gypsum board and off-the-shelf cellulose blown by a local contractor. (Cellulose is typically treated with boron or boric acid – to about 18% – to enhance its fire-resistance properties.) The maximum time to failure for an uninsulated wall section was 60 minutes; the minimum time to failure for a cellulose-insulated section was 76 minutes, a 26% increase in fire resistance. The average time to failure for uninsulated sections was 56 minutes; the lowest average time to failure for cellulosed-insulated sections was 82 minutes.

The earliest failure of an uninsulated section occurred at 53 minutes. When the test furnace was shut off at 94 minutes, 11 of the 25 thermocouples on the cellulose-insulated sections had not exceeded the limiting temperature rise of 325°F (163°C). This is a 77% increase of the 53-minute initial failure time of the uninsulated sections. A cellulose-insulated wall of similar design also passed the hose stream test required by the ASTM E119 method.

CIMA says that the results are especially impressive because the integrity of the test walls was compromised by the installation of 16 electrical boxes, 8 on each side of the wall. Prior to this test, the new *International Building Code* and *International Residential Code* were going to require that steel electrical boxed installed in one-hour

fire-rated walls be separated by at least 24 inches. But the test results persuaded the International Code Council to allow the installation of boxes on opposite side of the same stud cavity provided that the boxes are separated by cellulose insulation equal in thickness to the depth of the walls cavity.

Data from the Omega Point tests is consistent with studies conducted by the National Research Council (NRC) Canada, which found that cellulose increased fire resistance 22%-55%. The NRC data has been subject to question, however, because it was developed using small-scale fire tests. The Omega Point report is based on the full-scale ASTM E119 test method.