

Cellulose Insulation and Fire Safety

Studies of actual fires and demonstrations have shown that the dense fiber structure and fire retardants in cellulose insulation slow the spread of fire through a building giving occupants more time to escape and fire fighters more time to save the structure. During the manufacturing process cellulose fibers are permanently impregnated with a boric acid fire retardant. Cellulose insulation achieves a Class-A noncombustible rating and passes a strict battery of Federal 16 CFR Part 1209, ASTM E-84 smoldering, ASTM E-970 flame spread and ASTM E-119 fire endurance testing. Testing by Oak Ridge National Labs (1990)¹, US Testing Company (1991)², UL (1993)³ and US Borax (1994)⁴ all established that the fire retardant chemicals do not degrade over time and are permanently bound to the cellulose fibers.

1978 "Big Burn Demonstration"⁵

- Fiberglass insulated building
 - Ceiling failed at 20 minutes
 - Burned to ground in less than 2 hours
- Cellulose insulated building
 - Ceiling failed at 70 minutes
 - All four walls left standing, fire burned itself out after 3 hours

1994 NRCC National Fire Laboratories⁶

- Fire resistance of wall insulated with fiberglass is slightly worse than a non-insulated wall
- Fire resistance of wall insulated with cellulose is 11% to 55% better than a non-insulated wall

1998 NRCC National Fire Laboratories⁷

- Cellulose increases the fire resistance twice as well as fiberglass in a floor/ceiling assembly

1999 Omega Point Laboratories

- Cellulose insulated wall performed 77% better than uninsulated wall⁸
 - E-119 testing (1hr, 2hr firewalls) on Electrical box placement⁹
 - 24" Minimum Spacing for Fiberglass
 - 3.5" Minimum Spacing for Cellulose

References

1. Chiou, N., and Yarbrough, D., "Permanency of Boric Acid Used as a Fire Retardant in Cellulosic Insulation", *Energy and Buildings*, 14 (1990)
2. United States Testing Company, Study for Suncoast Insulation (1991)
3. England & Assoc. and Underwriters Laboratories, study for Suncoast Insulation (1993)
4. Perm, Donald J., and Shen, Kelvin K., US Borax, "Study on the Permanence of Borates in Cellulosic Insulation," *Proceedings of the Tenth International Conference on Thermal Insulation* (1994)
5. The Big Burn" *Insulators Guide*, September (1978)
6. National Research Council Canada, *Results of Fire Resistance Tests on Small-Scale Insulated and Non-Insulated Gypsum Board Protected Wall Assemblies* (July 1994)
7. National Research Council Canada, *Fire Resistance of Floor Assemblies in Multi-Family Buildings* (Sept 1998)
8. Omega Point Laboratories, *Project 16094-105450* (1999)
9. Omega Point Laboratories, *Project 16094-105449* (1999)

National Fiber's cellulose is the natural choice for insulation.

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