

## “KEEPING PACE” - #48

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### **PYROLYSIS**

The photograph below shows a furnace flue pipe which had been installed directly against the wood joists in the attic of an apartment building in Cincinnati for 10 years before it set the attic on fire. Over those years, the heat in the flue pipe gradually dried out the adjacent wood and carbonized it, so that its self-ignition temperature was greatly reduced. The normal self-ignition temperature of wood is 400°-450° F.

The following is quoted from the Abstract of UL Bulletin of Research No. 51:

“Part II is a survey of available information on the ignition of wood exposed to moderately elevated temperatures. Records of actual incidents, laboratory reports on experiments, and published technical literature were reviewed. They indicated authentic instances of the ignition of wooden surfaces exposed for long periods of time to low-pressure steam pipes and similar heat sources; the temperatures of which were in the order of 100 to 120C (212 to 248F).”



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### PREVIOUSLY BURNED WOOD:

Another similar incident occurred in a trucking company building in Cleveland. A small fire had occurred around a boiler's flue pipe just below the roof there from pyrolysis. The trucking company replaced the single wall flue pipe there with a double wall flue pipe, which should have been safer. Unfortunately, they did not also replace the burned wood around the flue. The burned wood had a lower self-ignition temperature than new wood, and a second fire was observed to start around the new flue pipe about two weeks later. This second fire went on to destroy most of the trucking company's building.



Sincerely,

Frederick F. Franklin, P.E.  
Forensic Engineer