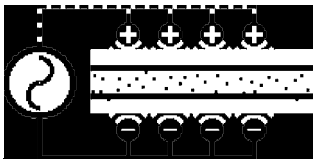
Background to Bonding with Radio Frequency Heating

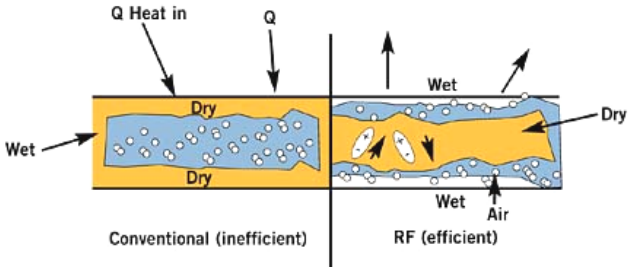
The use of radio frequency is merely a means of obtaining heat to cure glue lines in wood-to-wood joints. It can be considered a source of heat, like steam and electricity, and is measured in the same units of heat (Kilowatts).

This means of generating heat with radio frequency does differ from other sources. The electrical impulses or energy that are generated in suitable equipment are transmitted at very high cycles or frequency. Their passage through any mass results in some development of frictional heat, the degree dependant on the electrical characteristics of the mass.

Adhesives are particularly susceptible to radio frequency energy, and instant heat is created through molecular friction. RF current causes a



uniform or volumetric heating of the mass, being the wood and glue line. The glue line, having a much higher moisture content compared to the wood, tends to heat up quickly while the surrounding wood remains relatively cool. This is in contrast to other heat sources such as steam where the applied heat "soaks" slowly from the surfaces to the centre. The result is that RF gives a very fast uniform temperature rise, and this phenomenon can be used to advantage for certain applications.



The radio waves in RF heating range in frequency from 2 to 30 megacycles that is slightly above the "broadcast range". In broadcasting, the waves are transmitted from a generator to an antenna where they are broadcast indiscriminately.

However, in the case of RF gluing equipment the waves are transmitted or confined between plates or electrodes, and thus are put to use as a heat source to cure adhesives.

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