

# Radio Frequency Glue Bonding

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# Objectives

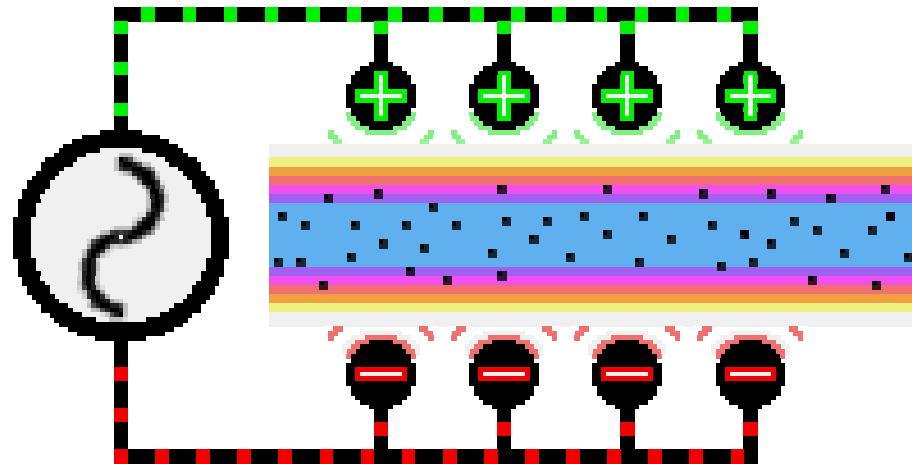
- To achieve a basic understanding of RF glue bonding applications
- How to reduce processing costs by achieving fast curing rates- “cure on demand”
- Discuss the potential technical benefits to your business

# Overview

- What is RF Curing?
  - RF Curing vs. conventional curing processes
- Benefits to Industry
  - Advantages/ benefits of RF heating
  - Focus on the Value- added market
- RF applications
  - Edge jointing, edge and bulk laminating

# What is RF heating?

- Instant heat is created through molecular friction.
- Typical frequencies used in RF curing are 13.56Mhz & 27.12Mhz.



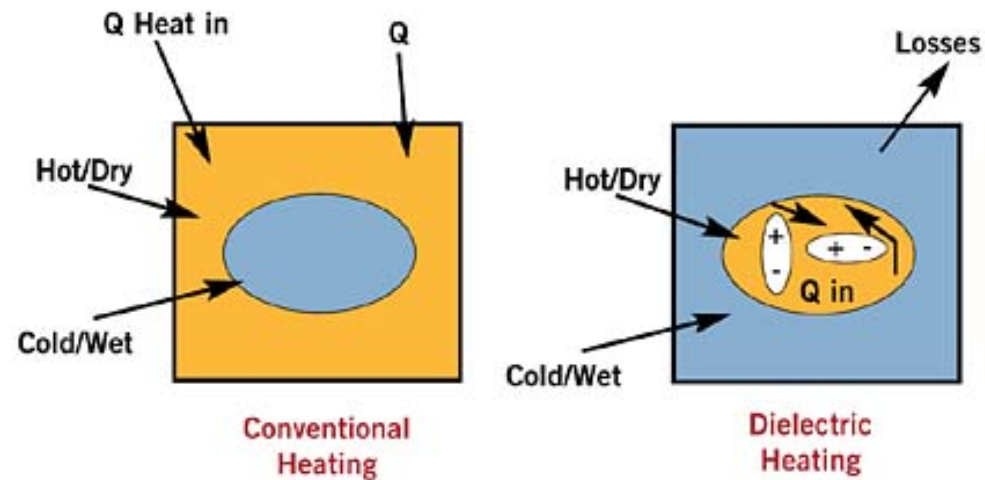
- Increasing the temperature by 10°C enables the curing time to be halved.
- Adhesives are heat reactive allowing them to cure & set faster when exposed to RF energy.

The effect of temperature on curing time of resin:

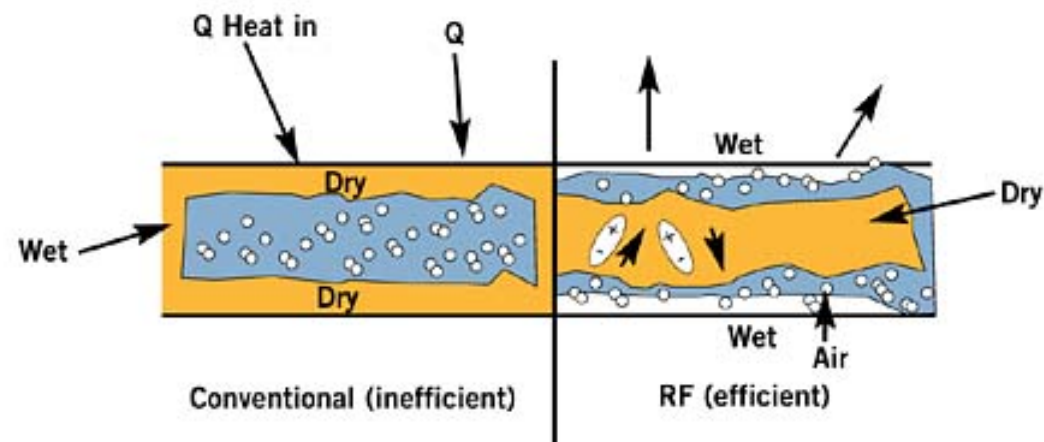
Temp °C	Curing Time
40	3 h
60	25 min
80	5 min
100	1 min

# RF vs. Convectional Drying

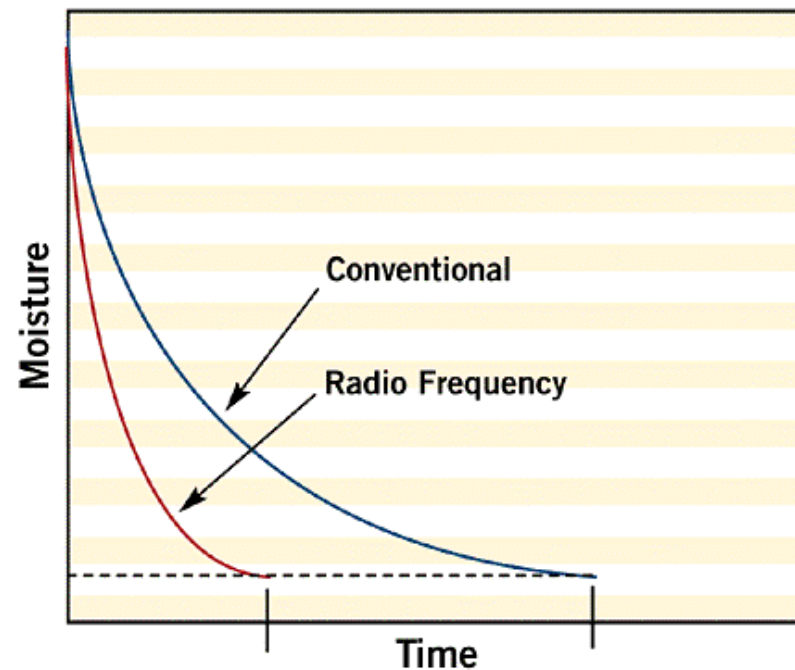
- Convectional heating: heat applied externally has to “soak” into the material by thermal conduction
- RF Heats volumetrically at the molecular level, selectively heating the wetter areas within the product.



- A conventionally dried product is hot & dry on the outside and cold and wet on the inside.
- With RF drying, moisture is driven to the surface.



- Convictional heating
  - Heat is applied externally having to “soak” by thermal conduction
  - Is a slow process
  - Overheating of the product surface may occur



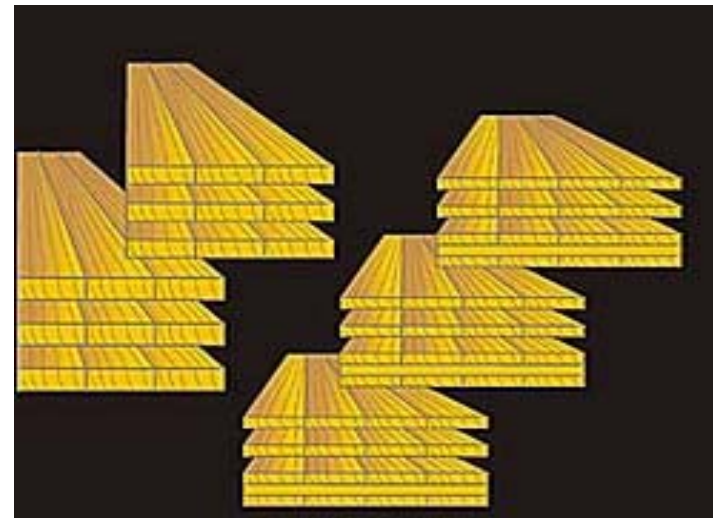
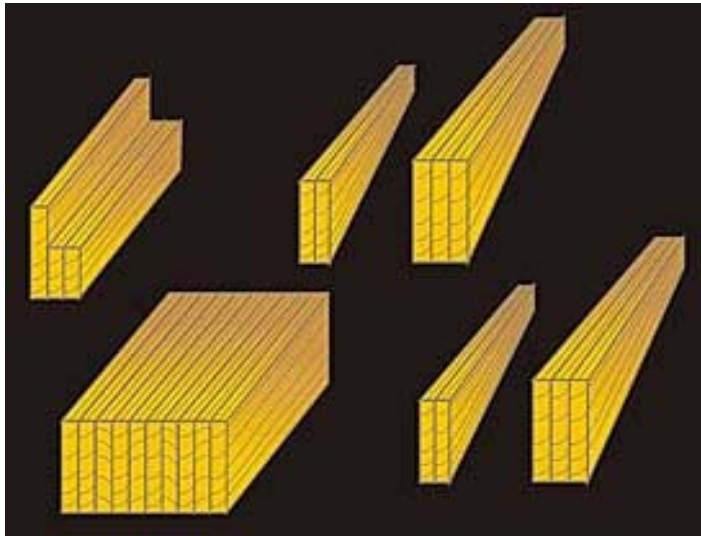


# Applications



# RF Edge Jointing

- Processed boards are flat eliminating planing
- Bonded panels are processed immediately
- Curing of boards & beams from finger jointed lengths or solid timber lengths



# Typical Application

- Moisture content 7% - 14%
- Power required for glue line heating 15kW to 60kW.
- lengths of timber indexed into RF press at intervals of 90 seconds
- Boards exiting press may be processed immediately (sanding, cutting, trimming etc.)
- tabletops, shelves, laminated beams, frames, doors, transport container floors etc.



# Technical Benefits of RF Heating

- Preferential heating
- Controlled curing Temperatures
- Unit costs reduced
- JIT practices
- Overheating avoided
- Reduced thermal stresses
- Reduced energy consumption
- Uniform moisture profiling

# Value Added



- Growth of VA products demands faster adhesive curing
- secondary manufacturing provides more income from each tree harvested
- RF heating provides competitive edge
- Affordable technology, local equipment manufacturers

# Summary

- enhance process heating, drying & curing
- “Cure on demand”
- reduce unit costs & improve quality
- computerized automation
- local technical support & knowledge