



High Class Adhesive Systems for Production of Sandwich Parquet

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Outline

- What is Sandwich Parquet
- Production data
- Press technology
- Adhesive Technology
- New developments
- Summary



Sandwich Parquet

- Parquet is a universal name for different types of wooden flooring materials
- Sandwich parquet is construction of three different layers of wood
- Sandwich parquet is the market leader in Europe



Sandwich Parquet - Construction





Production Data

- Total production of sandwich parquet in 2004
 - Europe
 - Ca 72 mill m² (650 mill sq.ft.)
 - Asia, Europe, North America
 - Upward of 90 mill m² (810 mill sq.ft.)

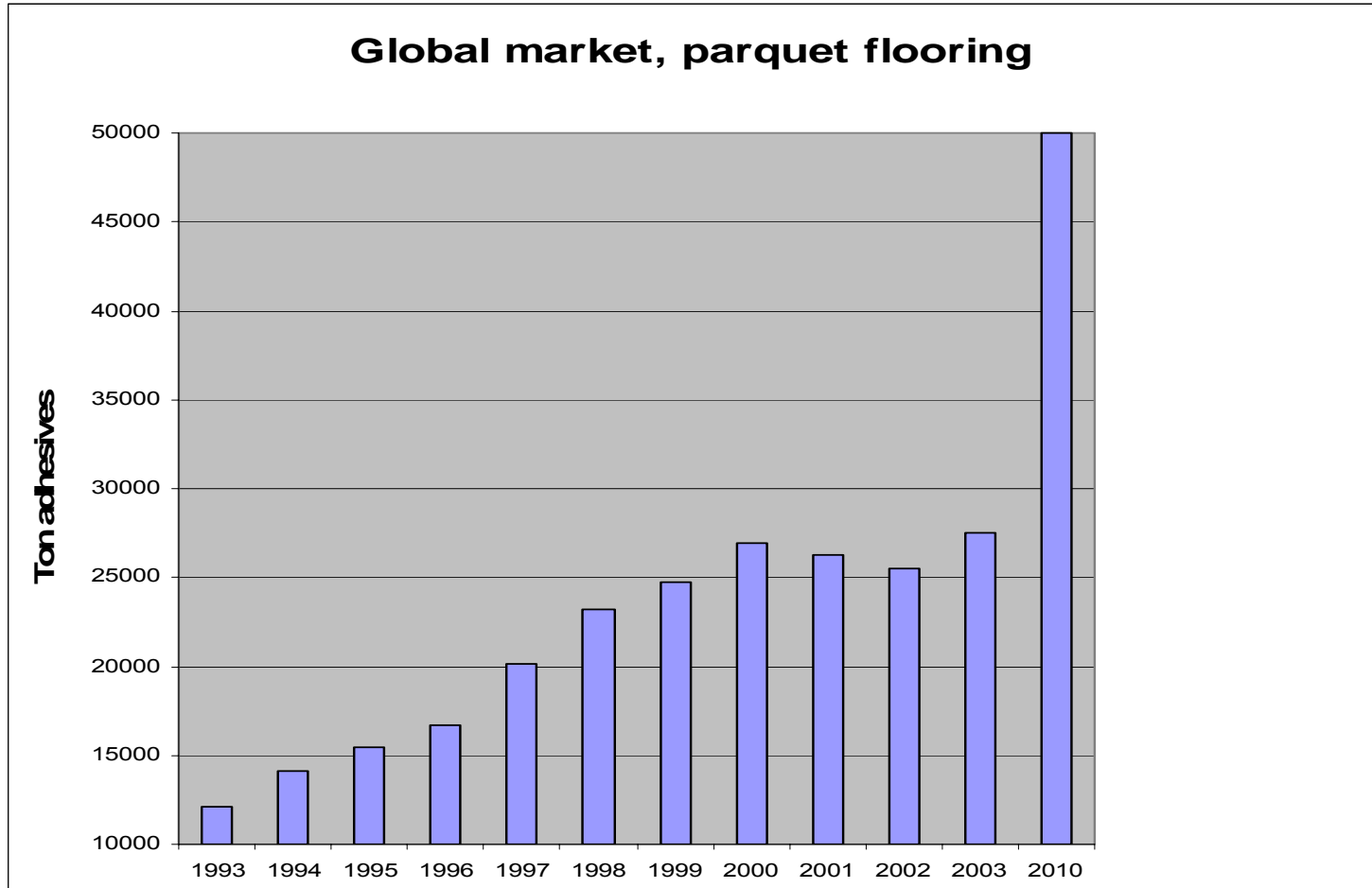


Production Data

- Total adhesive consumption for production of sandwich parquet in 2004
 - Europe
 - 16 000 tons
 - Asia, Europe, North America
 - Upward of 20 000 tons



Global Development, Parquet Flooring



Source
RWS Engineering Oy, Worldwide parquet outlook 2002



Press Technology

- Hot pressing
 - single opening presses
 - multi-daylight presses
- RF-pressing
 - stepwise
 - continuous



Adhesive Technology

- Thermosetting adhesives with hardeners
 - mix-in systems
 - adhesive and hardener mixed before application
 - separate application systems
 - adhesive and hardener applied separately on the same surface



Traditional Mix-in Systems

- State of the art 5 years ago – hot pressing
 - mix-in systems with various reactivity giving good bond quality
 - shorter pressing times desired, but difficult to obtain due to pot life limitations



Traditional Adhesive Systems

- State of the art 5 years ago – RF pressing
 - 50-60 sec cycle time for separate application systems
 - mix-in systems
 - significantly longer pressing times



New Developments – Mix-in Systems

- New adhesive technology with already existing hardener technology
 - more favorable relationship between pressing time and pot life
 - shorter pressing times while maintaining the pot life
 - same cycle time in RF-presses as traditional separate application systems



Traditional Separate Application Systems

- Traditional separate application hardeners
 - acid salts and/or organic acids dissolved in water
 - water-like consistency
- They give
 - short cycle times
 - not optimum bond properties



Traditional Separate Application Systems

- The hardeners are applied on the wood before the adhesive
 - partial penetration of the salts and acids into the wood
 - only partial exploitation of the salts/acids



New developments – Separate Application

- New hardener technology
 - formulated to avoid penetration
 - higher viscosity
 - gel time as traditional hardeners



New developments – Separate Application

- The new hardener technology gives
 - 25-50% reduction in total cycle time
 - much better bonding
 - assembly time as traditional
separate application hardeners



Summary

- Mix-in systems
 - development of better adhesive technology and new hardeners
 - reduction of pressing times
- Separate application systems
 - development of new hardener technology
 - better bonding
 - reduced cycle times