An Introduction to

Unit Load Design

Sponsored by:

MILLWOOD™ INCORPORATED AND AFFILIATED COMPANIES

Providing Product Unitization & Logistics Solutions

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Unit Load Systems

Consist of Three Interacting Components

Distribution Package

Pallet / Platform

Unit Load Handling Equipment

A New Approach

A system design approach includes the understanding of how packaging, pallets, and unit-load handling equipment interact

The designers of these components typically work **independently** with the goal of designing the lowest cost component

System (UNIT LOAD) Design

- Reduce product damage
- Reduce packaging cost
- Improve material handling efficiency
- Provide true environmental sustainability

Source: Wastenet

The Role of the Pallet

The pallet is the interface between the two other components of the logistics distribution system and is therefore the key to the systems design

All mechanical stress interactions pass through the pallet interface between packaging and handling equipment

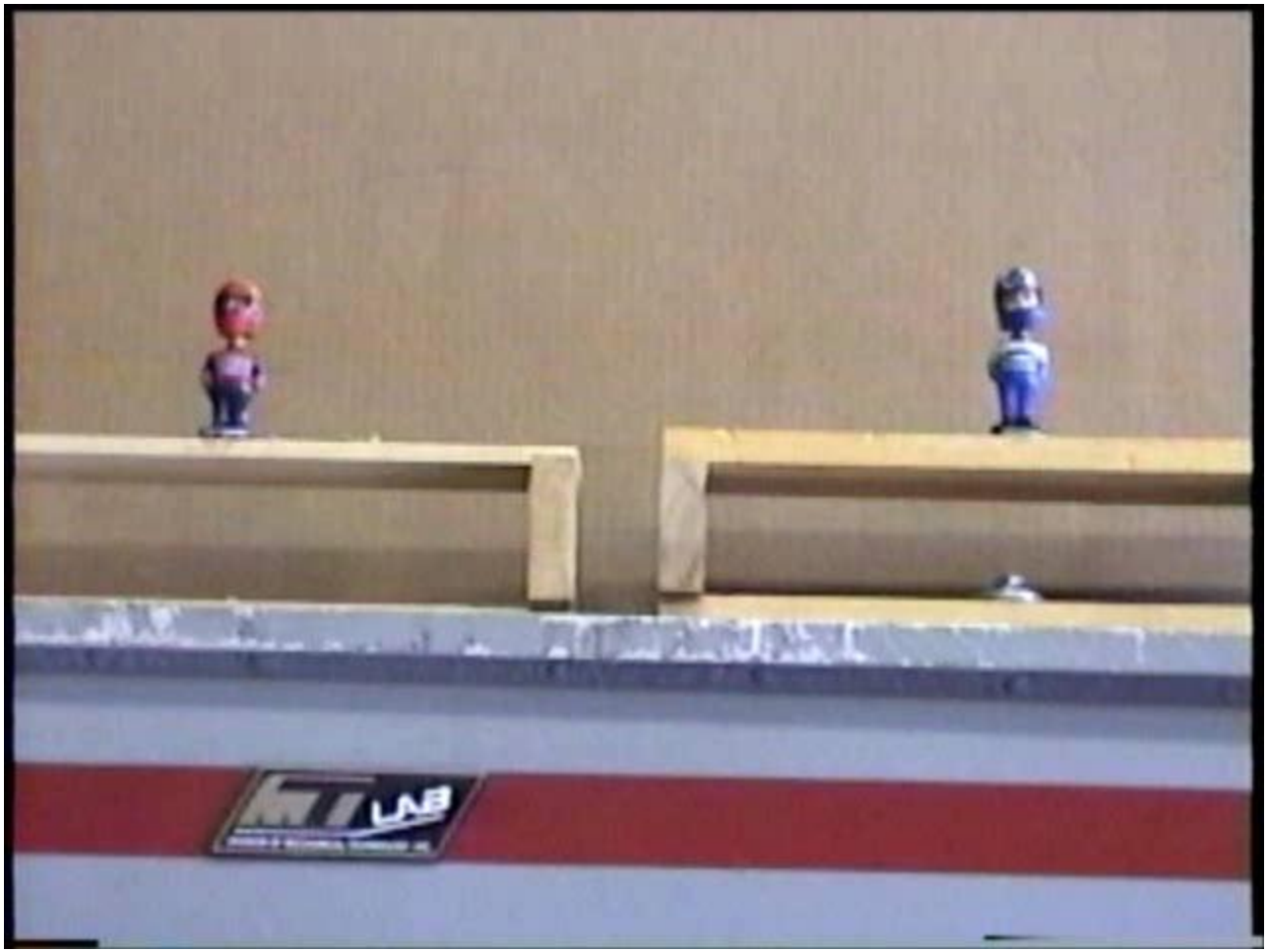
Interactions

- Pallet and Package
- Pallet and Equipment
- Unit Load Containment

Pallet - Package
INTERACTIONS

- Vibration
- Deckboard spacing
- Uneven deckboards

Vibration



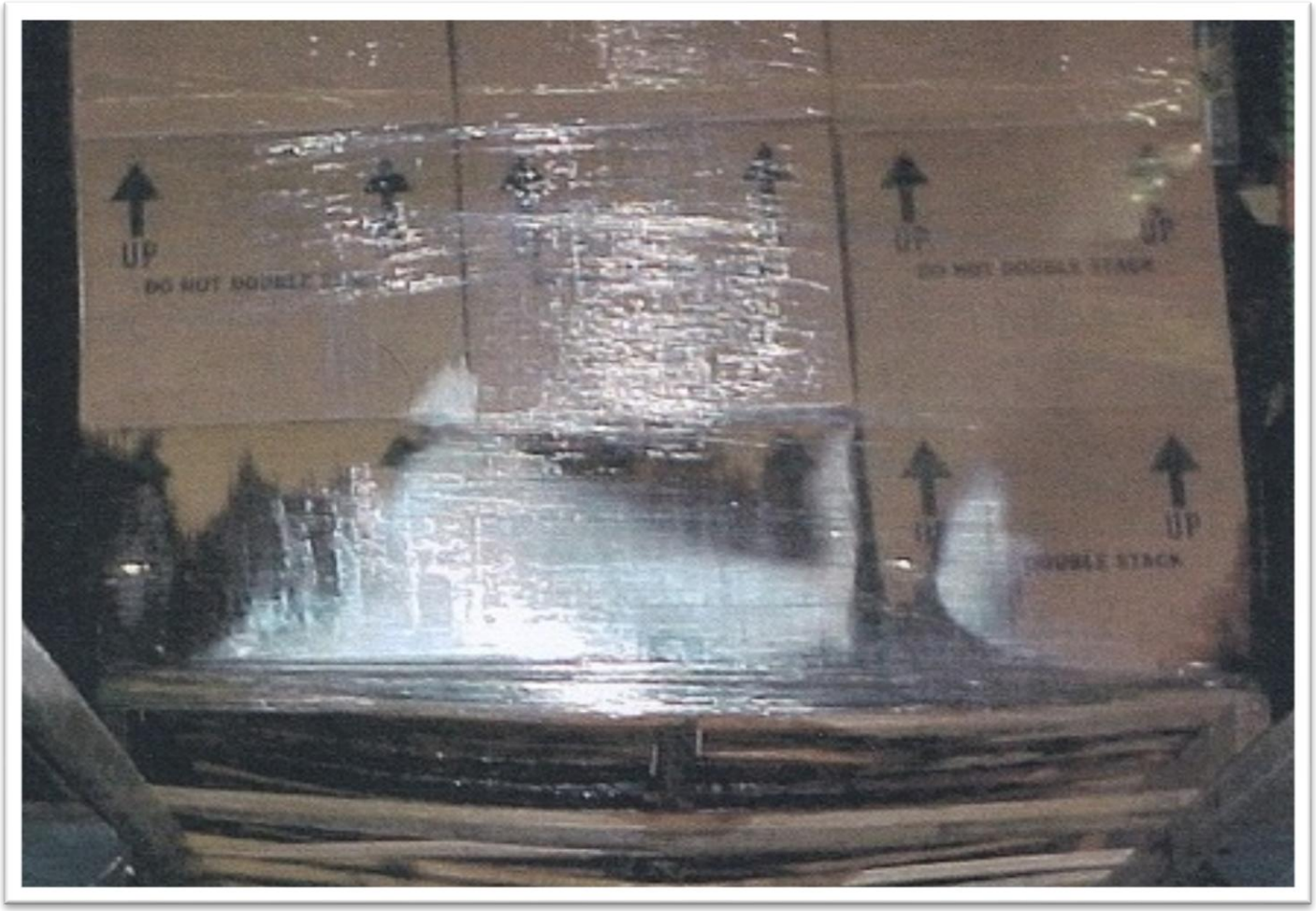
Deckboard Spacing

Uneven Deckboards

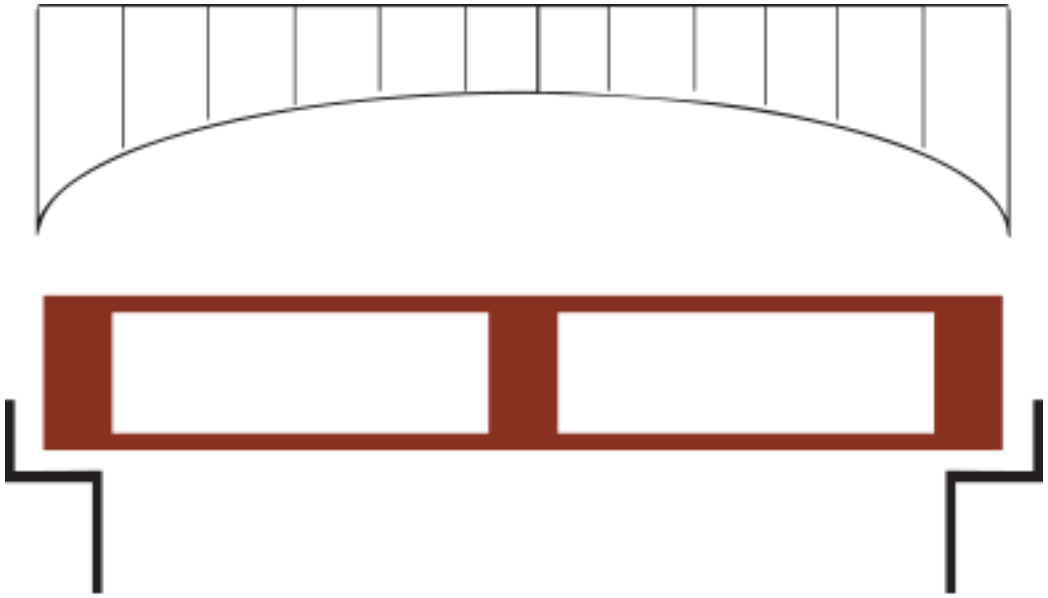
Pallet - Equipment
INTERACTIONS

- Rack Spans
  - Load Bridging
- Vibration
- Conveyor Spacing & Styles
- Handling Equipment
- Transportation Method

Rack Across Deckboards



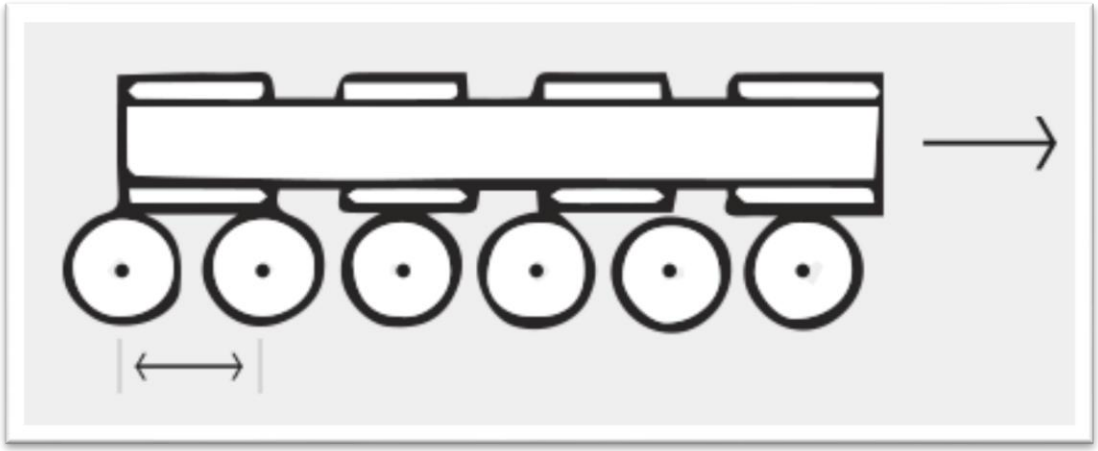
Load Bridging



Load bridging is the redistribution of load weight away from the center of the pallet

Low Load Bridging

Conveyor Spacing & Styles



Handling Equipment & Transportation Method

Variations in Handling Equipment & Transportation Methods can affect the System (Unit Load) Design

Container Condensation

Unit Load Containment

- Stretch Wrap
  - Load Stability
  - Film Utilization
  - Containment Force Measurement
- Strapping
- Tier Sheets / Load Adhesives
- Corner Posts

Unit Load Stability

System Approach Principles

- Packaging, pallet, and equipment terminology
- Design principles of each component
- How these components interact
- How these interactions constrain system design

The principles of

Unit Load System Design

can be used to . . .

- Design a new unit load system
- Troubleshoot an existing system
- Improve an existing system

True Sustainability

- Is not an individual component comparison but the total system evaluation, including damage rates
- A single damaged product will eliminate all the package sustainability gains

True Sustainability

- Independent changes in each component of the unit load has led to system failures
- Further gains in sustainable packaging must be approached from a system view

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