Utilizing Reusable Packaging in the Whirlpool Supply Chain

Las Vegas, NV
October 6, 2009

Presented By:
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Whirlpool Corporation
Background Information

• Education
  – Michigan State University
    • 2000: Packaging
    • 2008: MBA

• Professional
  – Toyota ‘99-’08
    • Export Packaging Development
    • External/Internal Logistics
    • Vehicle Design
    • Packaging Digital Assembly
    • Assembly Engineering
    • Contributed Savings = $50M
  – Whirlpool
    • Material Flow Improvement (Tier 1 to Plant Assembly Line)
    • Implementation of Returnable Packaging
Agenda

• Whirlpool Background Information
• Reusable Packaging Types
• Reusable Packaging Event Cycle
Whirlpool Background

- North American Production
  - Refrigeration, Cooking, Dish, Laundry, Countertop
- North American Sites
  - US=8, Mexico=3
- Returnable Packaging Percentage
  - ~30%
The Truth Behind Reusable Packaging

• Why?
  – Earth Friendly
  – Lower Total Cost
  – Improved Quality
  – Increase Logistics Cube
  – Safety
  – Automation
  – Standardization
  – Flexibility

• Why Not?
  – Initial Investment
  – Loss/Attrition
  – Replacement
  – ‘Sharing’
  – Return Logistics
  – Cleaning
  – Weight
  – Proper Use
  – Calculation
Common Types

- Hand Held Totes
- Knock Down
- Bail n Bin
- Bulk Bins
- Steel Racks
- Overseas
Common Types – Hand Held Totes

- Hand Held Totes
  - Multiple Sizes
  - Modular
  - Cube Efficient
  - Ergonomics
  - Cleanable
Common Types – Knockdown Totes

• Knockdown Totes
  – Multiple Sizes
  – Modular
  – Condensed
  – Ergonomic
Common Types – Bulk Bin

• Bulk Bins
  – Collapsible
  – Modular
  – Ergonomic
  – Durable
Common Types – Steel Racks

- Steel Racks
  - Engineered
  - Ergonomic
  - Durable
Additional Items

• Kanban Holders
• Labels
• Kennedy Placard
• Tote Labels
• Hot Stamps
Reusable Packaging Event Cycle
The reusable packaging event cycle occurs in several phases

- Phase 1: R.P. Concept Understanding
- Phase 2: R.P. Concept Acceptance
- Phase 3: R.P. Concept Implementation
- Phase 4: R.P. Concept Refinement
Concept Understanding

Phase 1
Reusable Packaging
Concept Understanding

- Total Systems Cost Analysis/Supply Chain Modeling
- Customer Case Studies
- Reusable Packaging Financial Alternatives
  - Rental
  - Ownership
    - Company
    - Suppliers
Concept Acceptance

Phase 2
Reusable Container Concept Acceptance

- Internal Stakeholder Alignment
- Level of Outsourcing
  - Logistics
  - Packaging
  - Container Management
- Financial Decision
  - Own/Rent
- Reusable Packaging Products
Concept Implementation

Phase 3
Reusable Packaging
Concept Implementation

- Role Definitions and Training
  - Internal Personnel
- Level of Outsourcing Implementation
  - Container Management
  - Logistics/Transportation
  - Project Management/Packaging
- Reusable Packaging Trial Program
  - Cost Validation
  - System Validation

Whirlpool is at this stage in its reusable development
Concept Refinement

Phase 4
Reusable Packaging Concept Refinement

System/Cost Improvement and Redesign Activities

Stakeholder Training
- Internal
- Customers
- Suppliers

Benchmarking

New Reusable Packaging Products

Toyota is at this stage in its reusable development
Whirlpool – What stage is Whirlpool at in the Event Cycle?

• Implementation

• However:
  – Long journey to gain acceptance = Must overcome silo organization
  – Understand current situation was challenging
  – Each plant has own philosophy
    • Returnable Corrugate Pooling
    • Buy returnables when/if budget is approved
    • Just happy to receive parts
Cost Justification Calculation Process

- External Transportation
- Pc Price, Total Investment
- Internal Conveyance and Handling
- Safety
- Quality
Low Change from Current Method

Scenario: Full Flap boxes with Tape vs Straight Wall Tote

1. Supplier prepare shipment (note: no need to tape)  
   Judge: O
2. External Logistics pick up freight  
   Judge: O
3. Customer unload, delivery to line  
   Judge: O
4. No need to cut open boxes  
   Judge: -
5. Customer pick up empty boxes from production line  
   Judge: O
6. Customer stage returns  
   (Staging returns takes the place of recycling, bailing, etc)  
   Judge: O
7. External Logistics returns empties to Supplier  
   Judge: +
8. Supplier unload other Supplier pkg to receive empties  
   (Supplier already unloads empty expendable pkg)  
   Judge: O

Judge Criteria:
+ = Additional work caused by Returnable
- = Removal of work caused by Returnable
o = No difference to current method/movement

Packaging, Activity Flow

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Logistics</th>
<th>Customer</th>
<th>Customer</th>
<th>Logistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pack, Tape, Palletize</td>
<td>Pick up/Deliver</td>
<td>Unload, Store, Delivery to Line</td>
<td>remove empty box from lineside,</td>
<td>returns empty pkg to supplier</td>
</tr>
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<td>remove empty box from lineside,</td>
<td>deliver empty pkg to returns stage area</td>
<td></td>
</tr>
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<td>remove empty box from lineside,</td>
<td>deliver empty box to recycle, garbage, bailer, etc</td>
<td></td>
<td></td>
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</table>
Transportation Calculation

- **Assumptions**
  - Expendable = 60% Cube Utilization
  - Returnable = 100% Cube Utilization
  - $1.65/Mile cost (one way)
  - $1.40/Mile Cost (round trip)

- Guaranteed Round Trip often reduces rate

<table>
<thead>
<tr>
<th>Miles</th>
<th>Cost/Mile</th>
<th>Part/Day</th>
<th>Parts/Truck</th>
<th>Cost/Truck</th>
<th>Cost/Pc</th>
<th>Trucks/Day</th>
<th>Cost/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Way</td>
<td>500</td>
<td>$1.65</td>
<td>5000</td>
<td>$825</td>
<td>$1.38</td>
<td>8</td>
<td>$6875</td>
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<tr>
<td>2 Way</td>
<td>1000</td>
<td>$1.40</td>
<td>5000</td>
<td>$1,400</td>
<td>$1.40</td>
<td>5</td>
<td>$7000</td>
</tr>
</tbody>
</table>
Packaging Cost Save Example

Assumptions:
1. 10 pcs per box
2. 10 boxes per pallet
3. 15 system days
4. Daily Volume = 1000
5. Project Life = 4 yrs
6. 250 working days/yr

- **Expendable**
  - $.85/Box, $6/Pallet
  - Cost/Pc = $.145
  - Cost/Yr = $36K
  - Cost/Project = $145K

- **Returnable**
  - $7/Box, $70/Lid, Skid
  - Cost/Pc = $.021
  - Cost/Yr = $5K
  - Cost/Project = $21K
### Total Cost Calculation: Log + Pkg

<table>
<thead>
<tr>
<th></th>
<th>Logistics Cost</th>
<th>Packaging Cost</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Way/Expendable</strong></td>
<td>$</td>
<td>$.10</td>
<td>$1.52</td>
</tr>
<tr>
<td><strong>2 Way/Returnable</strong></td>
<td>$</td>
<td>$.02</td>
<td>$1.42</td>
</tr>
</tbody>
</table>

- **Save/Pc**: $0.10
- **Save/Yr**: $25K
- **Save/Project**: $100K

⭐ Only 1 part number!
Internal Returnable Flow?

- **Returnable Packaging Supports**
  - Improve safety, Labor = not cutting boxes
  - Dolly delivery, small lots, high frequency

- **Calculation Process**
  - Before and After Time, Manpower
  - Storage Space
    - Recycle Bin, Lineside, Warehouse, Stackability

- **Challenge**
  - Batch processing makes justification difficult
Safety/Quality

• No cutting (Team Member/Part)
• Expendable Dunnage vs Returnable
• Note:
  – Maintenance is required to keep pkg clean, functional, safe and in the right place
How is Whirlpool going to Implement?

• Selected standard packaging
  – Totes, Bulk Bins, Steel Rack Footprint

• Creating Whirlpack
  – Online database to hold packaging data
  – Available to all locations, suppliers and fabricators
  – Project management and packaging approval process tool

• Utilizing ‘2PP’ to purchase packaging
What’s a 2PP?

• Second Party Packaging
• Purchase returnable packaging, lease to WHR over 4 years
• At end of lease?
  – WHR Re-lease for reduced cost
  – Other companies lease for reduced cost
How Much Packaging is Necessary?

- Delivery Frequency (Internal/External)
- System Days
  - In-house
  - Supplier
  - Logistics
  - Other
- Daily Volume
- Inventory Requirements
- Things to consider:
  - How lean is your system? -> Cost/Space
  - Striving for lower investment can support a leaner returnable process
What Parts Need Returnables?

Evaluate:

1. Quality Requirements
2. Safety
3. Presentation Requirements, Automation
4. Frequency of Pick up from Supplier
5. Distance from Supplier
6. Total Cost

Note: Higher frequency = Easier to justify
Small Parts = Challenging to justify
How to Decide Best Pack Size

• Space Lineside
  – Flow Rack
  – Footprint Storage Space

• Presentation Requirements

• Storage Space

• Delivery Frequency from Stores to Line

• Daily Volume

• Selected Standards
How to Decide Best Pack Size

• Toyota:
  – Smallest Box, Highest Lot without exceeding max weight and quality
  – BUT, high volume large parts might come in large rack to support total system cost
To Pool or Not to Pool

• What is it?
  – Sharing of common packaging among different locations vs dedicating packaging to specific part
  – Options:
    1. Intra plant/division/location
    2. Intra company (if multiple locations)
    3. With other customers via 3rd party
To Pool or Not to Pool

• Pro
  – Volume Fluctuation
  – Ease of Return
  – Easier for Supplier to use
  – Less Space

• Con
  – Challenging to problem solve
    • Miss Ships, ‘sharing’
  – Need for Discipline
Packaging Tracking

• Methods
  – Bar Codes
  – RFID
  – Aggregate

• Note:
  – Is this necessary?
  – What is goal of tracking?
  – What is cost?
What’s Next for Returnable Pkg?

• Increased standardization
• Improved designs
• Technology
  – Design, Tracking, Calculations
• Communication
Summary

- **Key Points**
  - Data Gathering
  - Long term vision required
  - All stakeholders must be involved with clear responsibilities
  - Implementations methods are not all the same
  - Maintenance
  - Improvement