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Specification for Materials Used to Close, Seal and Secure Packaging

Document Number and Revision: 950-1685-02 Rev 57

Overview

This specification defines the material used to close, seal and secure packaging for use with all Oracle finished goods.

Audience

Oracle Packaging Engineering.

Contents

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1.0 Scope

This Specification defines the Materials used to close, seal and secure packaging for use with all Oracle finished goods.

2.0   Applicable Documents

All material specifications in this document shall meet or exceed the requirements established by the following reference documents.

- Uniform Freight Classification UFC-6000-B, Rule 41, Uniform Freight Classification Committee, Chicago, Ill.

- ASTM D2860-87 Test Method for Adhesion of Pressure-Sensitive Tape to Fiberboard at Constant Stress

- ASTM D3330-87 Test Method for Peel Adhesion of Pressure-Sensitive Tape at 180º Angle

- ASTM D3652-83 Test Method for Thickness of Pressure-Sensitive and Gummed Tapes

- ASTM D3654-88 Test Method for Holding Power of Pressure-Sensitive Tapes

- ASTM D3759-88 Test Method for Tensile Strength and Elongation of Pressure-Sensitive Tapes

- ASTM D3889-88 Test Method for Adherence to Linerboard to Pressure-Sensitive Tapes at Low Temp.

- ASTM D3950-87 Standard Specification for Strapping, Plastic and Seals

- ASTM D3953-87 Standard Specification for Strapping, Flat Steel and Seals

- 914-1742-XX   Oracle Global Supplier Engineering Environmental Specification – Product Compliance

- 990-1237-XX   Oracle Corp: Restriction of Hazardous Substances (RoHS) Compliance and Declaration Policy

- 923-3763-XX   Oracle WWWOPS Supplier Management: Packaging First Article Inspection Reporting (FAIR)

- EIA-556-B   Annex A

3.0   General Requirements

This specification is designed to provide a basis for choosing material that meets the minimum requirements to sufficiently close or seal packaging containers, secure palletized loads, and include tamper evident seals.

4.0   Specifications for Container Closure Materials

Acceptable Container Closure

Default Container Closure Material and Use:

Clear Pressure-Sensitive Tape (Refer to section 4.2 for tape specification) is the default material for closing all of Oracle's finished good containers. The tape should be applied centered over the opening being sealed with tape extending a minimum of 3 inches (75mm) beyond the edge, where appropriate (Best practices box tape examples shown for different box styles in Figures 1-5 below).

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Best practices box taping examples of Oracle's most commonly used box styles are shown below:

- **RSC** (Regular Slotted Container) See Figure 1
- **HSC** (Half Slotted Container)
    - o The top of a HSC box is taped the same as RSC, but an HSC does not have bottom flaps, so it is most commonly used in combination with an integrated pallet. 4 bands are used to secure the HSC to an integrated pallet (Refer to section 5.2 for banding specification).
- **FOL** (Full Over Lap Container) See Figure 2
- **RTF** (Roll End Tuck Front) See Figure 3
- **OPF** (One Piece Folder) See Figure 4
- **FPF** (Five Panel Folder) See Figure 5
- **FT-DST** (Full Telescoping Design Style Tray Container – 2 piece box, bottom and telescoping lid), See Figure 6.
    - o Closure of a FT-DST style box should be closed using 2 bands (Refer to section 5.2 for banding specification), locate each band 'X' distance from the ends of the box (X dimension = depth of box + 25-75mm)
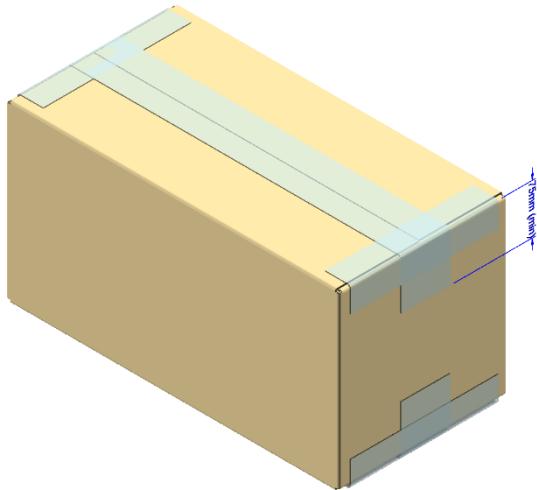
**Figure 1: Closure of RSC box**   **Figure 2: Closure of FOL box**
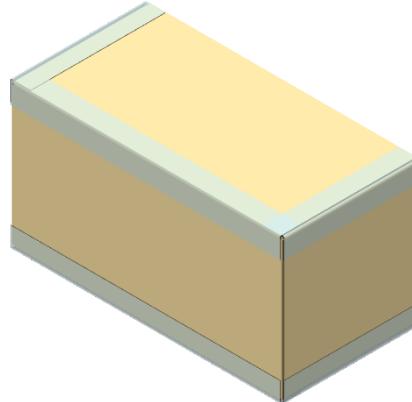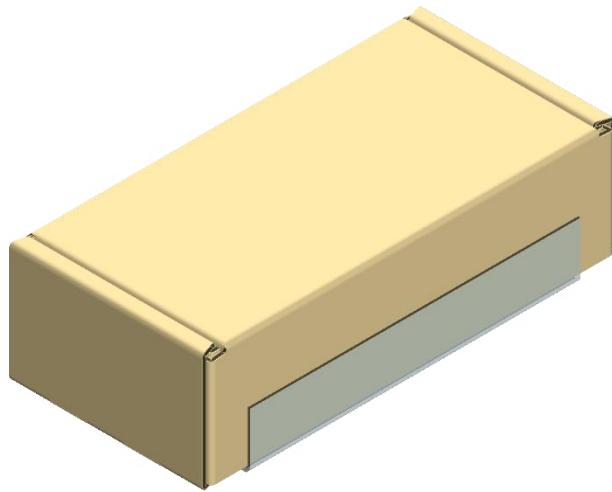
Figure 3: Closure of RTF box
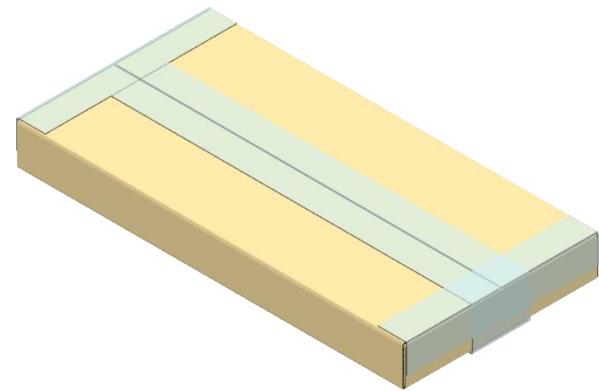
Figure 4: Closure of OPF box

RTF
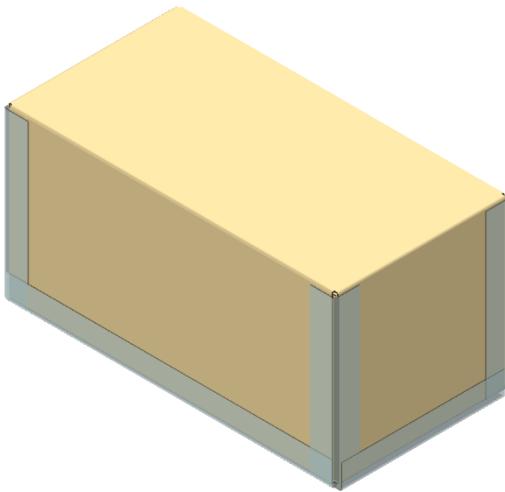
Figure 5: Closure of FPF box
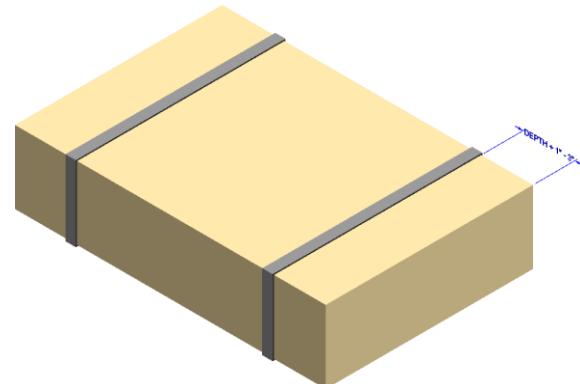
Figure 6: Band closure FT-DST

Alternative Container Closure Methods:

In some cases, container sealing may have unique requirements depending on the nature of the product and manufacturing limitations that would preclude the use of Clear Pressure-Sensitive Tape. Deviations from the above recommended method must be approved in writing by Oracle Packaging Engineering.

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Alternative container closure methods are listed here in order of preference:

     1. Kraft colored, reinforced, gummed paper tape (not permitted if a package requires Tamper Evident seals)

     2. Spot application of hot melt adhesive.

     3. Plastic Clips (e.g., Corro-Clips)

     4. Staples or stitches (ONLY if no other alternatives are available).

Minimum Requirements for Clear Pressure Sensitive Container Sealing Tape

Listed below are the minimum required specifications for pressure sensitive packaging tape used for closing

Oracle product containers.

•	Width	3.0" nominal (2.83"/72 mm actual) for most regular slotted containers (RSCs). As appropriate for other container styles.
•	Length	Length of container +6.0" (150 mm) for most RSCs. As required for other container styles.
•	Backing	Polypropylene
•	Adhesive	Rubber, Acrylic or other resin base with high initial tack and shear strength
•	Total thickness	3.0 mil (0.003"/0.08 mm)
•	Tensile-Machine Direction	26 lb/in. width (615N/100mm width)
•	Tensile-Cross direction	44 lb/in. width (1050N/100mm width)
•	Elongation (stretch @ break)	160%
•	Color	Clear

Minimum Requirements for Gummed Paper Tape

(not permitted if a package requires Tamper Evident seals)

•	Width	3.0" nominal (2.83"/72 mm actual) for most RSCs.
•	Length	Length of container +6.0" (150 mm) for most RSCs. As required for other container styles.
•	Backing (paper)	100% sulfate kraft, with a minimum basis weight of 60 lbs.
•	Reinforcement	Glass, sisal or rayon fiber combined with a high temperature laminate (asphalt)
•	Adhesive	Water activated, starch based.
•	Total thickness	6.0 mil (0.006"/0.16 mm)
•	Tensile-Machine Direction	75 lb/in. width (1312N/100 mm width)
•	Tensile-Cross direction	45 lb/in. width (787N/100 mm width)
•	Elongation (stretch @ break)	Not to exceed 15%

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- Color   Kraft

Minimum Requirements for Hot Melt Adhesives

- Adhesive Material   100% solids content thermoplastic
- Active Temperature Range   Must maintain bonds from -20 degrees F to +165 degrees F (-29 C -74 C)
- Coverage   Minimum of 25% of flap contact area with bonded areas within 0.5" (12 mm) of center seam
- Weight Limitation   Can only be used for containers weighing less than 65 lb (29.5 kg)

Minimum Requirements for Staples and Stitches

- Material   Ferrous materials with a hardness of equivalent of Rockwell B-90
- Size Alternatives   Flat wire 0.037" (0.94 mm) thick, 0.074" (1.9 mm) wide, Crown of 1.25" (32 mm)
- .   Flat wire 0.028" (0.71 mm) thick, 0.103" (2.6 mm) wide, Crown of 1.25" (32 mm)
- .   Accurate wire 0.027 (0.69 mm) thick, 0.095 (2.4 mm) wide, Crown of 1.0" (25.4 mm)
- .   Accurate wire 0.020 (0.50 mm) thick, 0.103" (2.6 mm) wide, Crown of 1.25" (32 mm)
- Spacing & coverage   •   Space not more than 2.5" (64 mm) apart, fastening the entire length of side edges and center seam

5.0 Specifications for Materials used to Secure Palletized Loads

The materials in this section are intended to be used with palletized shipments. Banding materials may be used with unitized loads on pallets or for a single packaged product on an integrated pallet. Bands used to ship rack products are intended to secure the corrugated package to the pallet. The bands are not intended to secure the rack to the pallet. The racks shall be secured/bolted to the pallet with pallet hold down brackets, see BOM for details. See Figure 7 of a typical rack package with integrated pallet and corrugated.

Generally any package with an integrated pallet (Rack packaging as well as products 3RU or larger, have an integrated pallet), requires 4 way banding, 4 bands total, 2 over the top of the corrugated through the length of the pallet, and 2 over <u>Each band shall be one continuous unbroken loop with a single banding closure (banding clip or friction weld) per band</u> the top of the corrugated through the width of the pallet.

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Figure 7: Rack Package with Integrated Pallet, corrugated banded 4-ways

For information on the application of materials in this section, refer to Oracle Specification 425-1019-XX: Palletization Specification for Inbound/Outbound Shipments.

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5.1 Specifications for Banding

Use the following table when selecting the appropriate banding material:

BANDING MATERIAL	MAXIMUM PACKAGED PRODUCT WEIGHT	MAXIMUM PACKAGED PRODUCT WEIGHT
Banding Material	(lb.) Per Band	(lb.) Using Quantity 2 Bands
0.50" x 0.020" polyester	280	560
0.62" x 0.035" polyester	635	1300
0.50" x 0.020" steel	536	1073

Note:

- Use a minimum of four bands per container (2 bands on each side of the pallet) <u>Each band shall be one continuous unbroken loop with a single banding closure (banding clip or friction weld) per band</u>
- Polyester banding to be used unless otherwise specified
- Steel banding to be used only with approval of Oracle Packaging Engineering
- Polypropylene banding is **NOT** allowed under any condition
- Edge protectors shall be used as required:

Edge Protectors

Reference   411-1543-XX   Plastic

               8212193   chipboard 48" long x 2" x 2" x 0.225" thick, kraft, V-Board

5.1.1 Minimum Requirements for Plastic Banding

For polyester banding, a friction weld sealing tool or heavy-duty (serrated or grit interior surface) banding clip shall be used. Adjustments to the friction weld sealing tool may be necessary to achieve optimum closure efficiency. Closure and closure equipment or friction weld sealing tools must be compatible with polyester banding and must maintain minimum of 70% joint efficiency.

0.50 x 0.020" Polyester Banding

- Material   Extruded, oriented polyester
- Nominal width   0.50" (12.70 mm)
- Nominal thickness   0.020"(0.50 mm)
- Minimum Breaking strength   600 lbf

0.62 x 0.035" Polyester Banding

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- Material   Extruded, oriented polyester
- Nominal width   0.625" (15.88 mm)
- Nominal thickness   0.035" (0.89 mm)
- Minimum breaking strength   1400 lbf

5.1.2 Minimum Requirements for Flat Steel Banding

For steel banding, a steel banding clip shall be used.

- Material   Carbon steel
- Nominal width   0.50" (12.70 mm)
- Nominal thickness   0.020" (0.50 mm)
- Minimum breaking strength   1150 lbf

5.2 Specifications for Stretch Wrapping Materials

- Materials   Linear Low Density Polyethylene (LLDPE) preferred
  Polyvinyl Chloride (PVC) not permitted
- Thickness (gauge)   Minimum of 70 gauge
- Cling Characteristics (g)   Minimum of 160 g
- Tensile stress (psi)   Minimum of 5,000 psi
- Puncture resistance (psi)   Minimum of 14 psi
- Stretch (%)   Varies with machine limitations. Films vary from 50-200%. Use appropriate film for intended application. Note: Higher stretch%=reduced cost due to increased use of same linear feet of film used.

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Revision History

REVISION	ECO NUMBER	DESCRIPTION	DATE
50	WO_18021	Eng Rel Per ECO#	08/04/00
51	WO_37052	Update document format and add Tape Purchase Process to Section 5.1	05/30/07
52	WO_40324	Updated Section 4.1 and Appendix A Process & Template Owners	11/05/08
53	WO_43000	Updated to remove logo information	05/06/10
54	E54463	Updated to add Tamper Evident Labeling, Fix PN Reference	01/26/21
55	E54969	Allow friction weld band sealing in combination with Tamper Evident Labels Add best practice taping instructions	4/14/21
56	E56423	AQP Reformat to Redwood Template. Update new Tamper evident label part number. Update figures to reflect new rack packaging change from reduced width corrugated to full width corrugated.	01/11/22
57		remove Tamper Evident content from 950-1685 as it is now in its own specification 8218708	12/07/23

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