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Palletisation Rules

Palletisation Rules – Dispatch SOP

This page defines the business rules used to determine when an order should be dispatched on a pallet rather than via standard parcel packaging. These rules are applied after `BoxPacker` has calculated the optimal packages for the order.

1. Purpose

To ensure consistency, cost-efficiency, and safe transport of large or high-value orders by automatically determining when palletisation is required.

2. Overview

All orders are first processed through the **DeliveryCalculator** and **BoxPacker** to find the most efficient fit using available packaging (boxes, wrappers, tubes, or custom packages). The rules below are then applied to determine whether pallet delivery is required or recommended.

3. Palletisation Decision Rules

Rule 1 – Mandatory Pallet (10×5 Jobs)
Any product marked as “10×5” or exceeding **3050 mm width** or **1520 mm height** must always be shipped on a pallet.
Reason: Size exceeds courier handling limits.
Rule 2 – High Value Orders (£1000+)
Any order with a total value of **£1000 or more** should be palletised by default.
Reason: Reduces risk of damage or loss for high-value shipments.
Rule 3 – Quantity Threshold
If the order contains **6 or more packages** (boxes, tubes, or wrappers), pallet delivery is preferred.
Reason: More efficient and secure bulk transport.

Rule 4 – Custom Package Threshold
If the order includes **4 or more custom packages**, pallet delivery is recommended.
Reason: Custom packages are typically larger or irregular; combining them increases handling risk.
Rule 5 – Large Format Escalation
If any single package exceeds **1200 mm width** and **800 mm height**, a pallet should be used.
Reason: Size approaches courier limits; palletisation ensures stability and protection.
Rule 6 – Volume-Based Recommendation
If total combined package volume exceeds roughly **70% of the smallest pallet volume** (0.67 m^3), escalate to pallet delivery.
Reason: Predictive optimisation to avoid multiple parcel shipments.

4. Pallet Type Selection

Condition	Pallet Type
Width ≤ 1200 mm and Height ≤ 800 mm	Euro Pallet – 800
Width ≤ 1220 mm and Height ≤ 1000 mm	4×4 Pallet
Width ≤ 2440 mm and Height ≤ 1220 mm	8×4 Pallet
Width > 2440 mm or Height > 1500 mm	10×5 Pallet

5. Decision Summary

Trigger	Action
Contains 10×5 item	Mandatory pallet (10×5 Pallet)
Order value ≥ £1000	Use pallet
≥ 6 packages total	Prefer pallet
≥ 4 custom packages	Prefer pallet
Any package > 1200×800 mm	Use pallet (choose based on size)
Volume > 70% of smallest pallet	Recommend pallet

Note: These palletisation rules are applied automatically within the `DispatchPolicyEvaluator` service after `BoxPacker` has generated the list of packages. The system records the reasoning for each pallet decision for auditing and optimisation.

Packaging

Package Name	Dimensions	Internal Dimensions	Courier	Supplier	Cost
A3 Book Wrapper	470x350x70	420x300x50	Fedex	Internal	0.55
Box - Small	305x229x229		Fedex	Antalis	1.10
Tube - Small	750x150x150		Fedex	Antalis	0.87
Tube - Medium	950x150x150		Fedex	Antalis	1.27
Tube - Large	1100x150x150		Fedex	Antalis	1.41
Tube - Double Small	1350x150x150		Fedex	Antalis	1.74
Tube - Double Medium	1750x150x150		Fedex	Antalis	2.54
Box - Medium	457x305x305		Fedex	Antalis	2.33
A1 - Wrapper	950x750x70	860x630x50	Fedex	Internal	1.80
Tube - Double Large	2000x150x150		DX	Antalis	2.82
Tube - Full Length	3200x150x150		DX	Antalis	4.23
A0 - Wrapper	1400x950x70	1200x900x50	DX	Internal	2.50
Tube Oversized	2500x200x200		DX	Repurposed Packaging	
Box - Large	610x457x457		Fedex	Antalis	1.35
Cardboard Sheet	1600x2150		DX	Antalis	2.03