



BRAND: ANONYMIZED \$30M+ SPORTS NUTRITION DTC

ILLUSTRATIVE DATASET: 91-Day Multi-SKU Sports Nutrition Catalog (25,741 Audited Shipments)

CARRIER BASELINE: 139 DIM Standard

AUDIT WINDOW: 91 Days (Q1 Benchmark)

SHIPMENT ROWS: 25,741

THE DISCOVERY

The Geometric Void: How Static Outer Carton Suites Force Carrier Air Taxes on Standalone & Multi-SKU DTC Orders

Standard ShipStation and Shopify reporting buries dimensional weight penalties inside total carrier spend. It never surfaces at the SKU level. The result is a systematic, invisible margin leak that compounds on every shipment, every day, without triggering a single alert in your existing analytics.

BASELINE BLEED

\$75,282

The Audit Covers all 25,741 catalog orders (both single-item and multi-SKU)

ACTIONABLE RECOVERY

\$63,990

Quarterly Actionable Recovery: \$63,990 (Modeled 85% Capture Rate)

NET VOID AIR CONCENTRATION

95.3%

Billable void space vs. packed mass

ANNUALIZED PROJECTED RUN-RATE

\$255,960

Per Year Net Recovery at current throughput

Up to 15%

INDUSTRY AVG. IMPACT

Of net shipping budget lost to dimensional weight penalties. Most DTC brands shipping supplements, skincare, and consumer goods are paying a carrier penalty on every single order because their box dimensions are larger than their product.

DIMENSIONAL FORENSICS

Spatial Intelligence: 3D WebGL Bounding-Box Analysis

Physics vs. Profit - How Carriers Bill for Air

Actual
Box: 16x16x16

(4,096
in3)

Optimal
Box: 12x12x8

(1,152
in3)

Packed
Mass: 4.7%

Void
Space: 90.9%

#118560 - Nighttime Recovery Bundle + Testosterone Support
Complex

#101988 • Organic Super Greens Powder + Performance Whey Protein (Chocolate, 2lb)

3D WebGL Cartonization Blueprint (2 Items, 2 Unique SKUs)

Rigid (Cuboid)

Cylindrical (Tub)

Soft (Compressed)

Actual: 16x16x16 (Oversized / DIM Penalty)

Optimal: 12x12x8 (Verified Fit)

Load optimized_coordinates.json

Actual: 16x16x16 (Oversized / DIM Penalty)

Optimal: 12x12x8 (Verified Fit)

CARTON PROVENANCE • PROSPECTIVE

Standard Commercial Corrugated Suite

EFFICIENCY DELTA

Act: 16x16x16 90.9% Void

Est. DIM: 30 lbs

Opt: 12x12x8 67.6% Void

Est. DIM: 9 lbs

AIR REMOVED -71.9%

TIER DROP -21 lbs

SHIPPING AIR 90.9% wasted void

PACKING UTILIZATION 9.1% density

PER-ORDER LOSS \$14.00 bleed

ACTIONABLE SAVINGS \$11.90 85% yield

Executive Note
Carrierbilledweight (29.7 lbs) exceeds actual product mass (8.0 lbs) by 271% due to dimensional step-thresholds. Consolidating this single 16x16x16 carton profile into a 12x12x8 footprint recovers **\$6,889.53** monthly (\$20,668 per quarter) across catalog throughput.

DIM WEIGHT FORMULA: $(\text{Length} \times \text{Width} \times \text{Height}) / 139 = \text{Billable DIM Weight (lbs)}$

LUMINAL LOGISTICS FORENSICS | SPATIAL BLUEPRINT
CONFIDENTIAL // ILLUSTRATIVE BENCHMARK REPORT - FOR METHODOLOGY & CAPABILITY EVALUATION ONLY

CART-LEVEL ANALYSIS

HIGH-FRICTION SKU COMBINATIONS: Top 5 Multi-Item Packing Bottlenecks

Ranked by total shipping bleed leakage across order history

EXECUTIVE DIRECTIVE

Top 5 Bundle Hit List (Highest Money-Leaking SKU Combos)

Ranked by total shipping bleed leakage across order history

RANK #1 Organic Super Greens Powder + Performance Whey Protein (Chocolate, 2lb) BUNDLE DIRECTIVE #1: The 'Organic Super Greens Powder + Performance Whey Protein (Chocolate, 2lb)' combo was shipped 54 times in a 16×16×16 box. Right-sizing to 10×8×6 recovers an average of \$10.61/order (\$573.00 total).	FREQUENCY 54 orders	TOTAL BLEED \$573.00	AVG SAVINGS/ORDER +\$10.61
RANK #2 Nitric Oxide Pre-Workout (Blue Razz) + Ultimate Performance Stack BUNDLE DIRECTIVE #2: The 'Nitric Oxide Pre-Workout (Blue Razz) + Ultimate Performance Stack' combo was shipped 59 times in a 14×14×14 box. Right-sizing to 10×8×6 recovers an average of \$9.42/order (\$556.00 total).	FREQUENCY 59 orders	TOTAL BLEED \$556.00	AVG SAVINGS/ORDER +\$9.42
RANK #3 Nighttime Recovery Bundle + Testosterone Support Complex BUNDLE DIRECTIVE #3: The 'Nighttime Recovery Bundle + Testosterone Support Complex' combo was shipped 53 times in a 18×14×12 box. Right-sizing to 10×8×6 recovers an average of \$10.42/order (\$552.50 total).	FREQUENCY 53 orders	TOTAL BLEED \$552.50	AVG SAVINGS/ORDER +\$10.42
RANK #4 Micronized Creatine Monohydrate + Testosterone Support Complex BUNDLE DIRECTIVE #4: The 'Micronized Creatine Monohydrate + Testosterone Support Complex' combo was shipped 51 times in a 18×14×12 box. Right-sizing to 10×8×6 recovers an average of \$10.74/order (\$547.50 total).	FREQUENCY 51 orders	TOTAL BLEED \$547.50	AVG SAVINGS/ORDER +\$10.74
RANK #5 Organic Super Greens Powder + Testosterone Support Complex BUNDLE DIRECTIVE #5: The 'Organic Super Greens Powder + Testosterone Support Complex' combo was shipped 51 times in a 14×14×14 box. Right-sizing to 10×8×6 recovers an average of \$10.67/order (\$544.00 total).	FREQUENCY 51 orders	TOTAL BLEED \$544.00	AVG SAVINGS/ORDER +\$10.67

Terminology Note: Each entry above represents a **SKU Pairing** (multi-item order combination) fulfilled in an oversized carton. **Audit Finding** = historical shipment data. **Batch Recovery** = total margin recaptured by right-sizing the carton profile.

Packing Bottleneck Insight: Top 5 SKU combinations recover **\$2,773** across **268** orders, averaging **+\$10.35** in pure net margin recovery per multi-item box.

IMPLEMENTATION PATHWAYS

Physical Remediation: Structural Box Suite Alternatives



High-Tolerance Cartonization Engine

RECOMMENDED - IMMEDIATE DEPLOY

- Dynamically routes orders into **4 optimal carton profiles** based on real-time 3D SKU bounding data.
- Eliminates packer guesswork by surfacing exact box dimensions at scan-to-pack stations via WMS overlay.
- Captures \$63,990 net quarterly margin (\$255,960 annualized) with an 85% operational capture rate.
- Compatible with existing corrugated supply chain - no structural packaging redesign required.

PROJECTED QUARTERLY RECOVERY

\$63,990

Vendor setup: None required

LOW RISK



SIOC & Wrap-Around Structural Packaging

ADVANCED - STRATEGIC REDESIGN

- Eliminates secondary corrugated void **entirely** for high-velocity standalone bundles.
- Ships in Own Container (SIOC) design reduces DIM divisor exposure to near-zero for qualified SKUs.
- Wrap-around structural inserts replace loose-fill dunnage with precision-cut fiberboard or molded pulp.
- Requires packaging engineering lead time and supplier qualification - best for top 20% velocity SKUs.

STRATEGIC IMPACT

100% Void Elimination

Implementation window: 60-90 days - Requires structural packaging partner

HIGH UPSIDE

48-HOUR PROTOCOL

Engagement Framework: Running 3D Forensics Across Your Order History

01

01 Connect 2 Core CSVs

Export Order Line Items (SKU dimensions) and Shipped Package Manifest (box sizes & billed weights). 5-minute standard export from ShipStation, Shopify, or 3PL portal.

ORDERS.CSV

PACKAGES.CSV

02

02 Ingest into 3D Pipeline

Secure transfer. Data handling commitment signed first. Pipeline maps every shipment against FedEx and UPS DIM rules.

ISOLATED

ENCRYPTED

03

03 Map SKU Bundle Hit List

Granular extraction engine surfaces SKU-level anomalies and hidden carrier surcharge penalties in minutes.

SKU-LEVEL

REAL-TIME

04

04 Deliver Forensic Action Plan

Full 48-hour diagnostic delivery: 4-box master consolidation matrix, SKU leakage hit list, WMS scan-to-pack routing rules, and corrugate supplier specs.

PDF REPORT

48-HOUR SLA

 Data Sovereignty Protocol Dedicated Processing

Audits are executed in isolated, non-shared computing environments. Manifest data is never used to train public AI models.

 Governed Retention

All raw customer and shipment manifests permanently purged within 30 days of audit delivery upon written request.

 Strict Confidentiality

Protected by pre-signed Mutual Non-Disclosure Agreement (MNDA) executed prior to file ingestion.

 No Third Parties

Data is never shared, sold, referenced, or used for any purpose beyond your audit.

NO THIRD PARTIES - Your data is never shared, sold, referenced, or used for any purpose beyond your audit.

Audit Delivery: 48-Hour SLA | **Core Inputs:** 2 Standard CSV Exports (Orders + Package Manifest) | **Mandatory Inputs:** Carrier Rate Cards, SKU Master, & Warehouse Box Catalog | **Security:** PII-Scrubbed Files | **No Platform Credentials Required**



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Logistics Intelligence & Automation Framework