



# Packing and Load Optimization

Reduce your logistics costs with advanced 3D packing and load optimization for cartons, pallets, trucks and containers

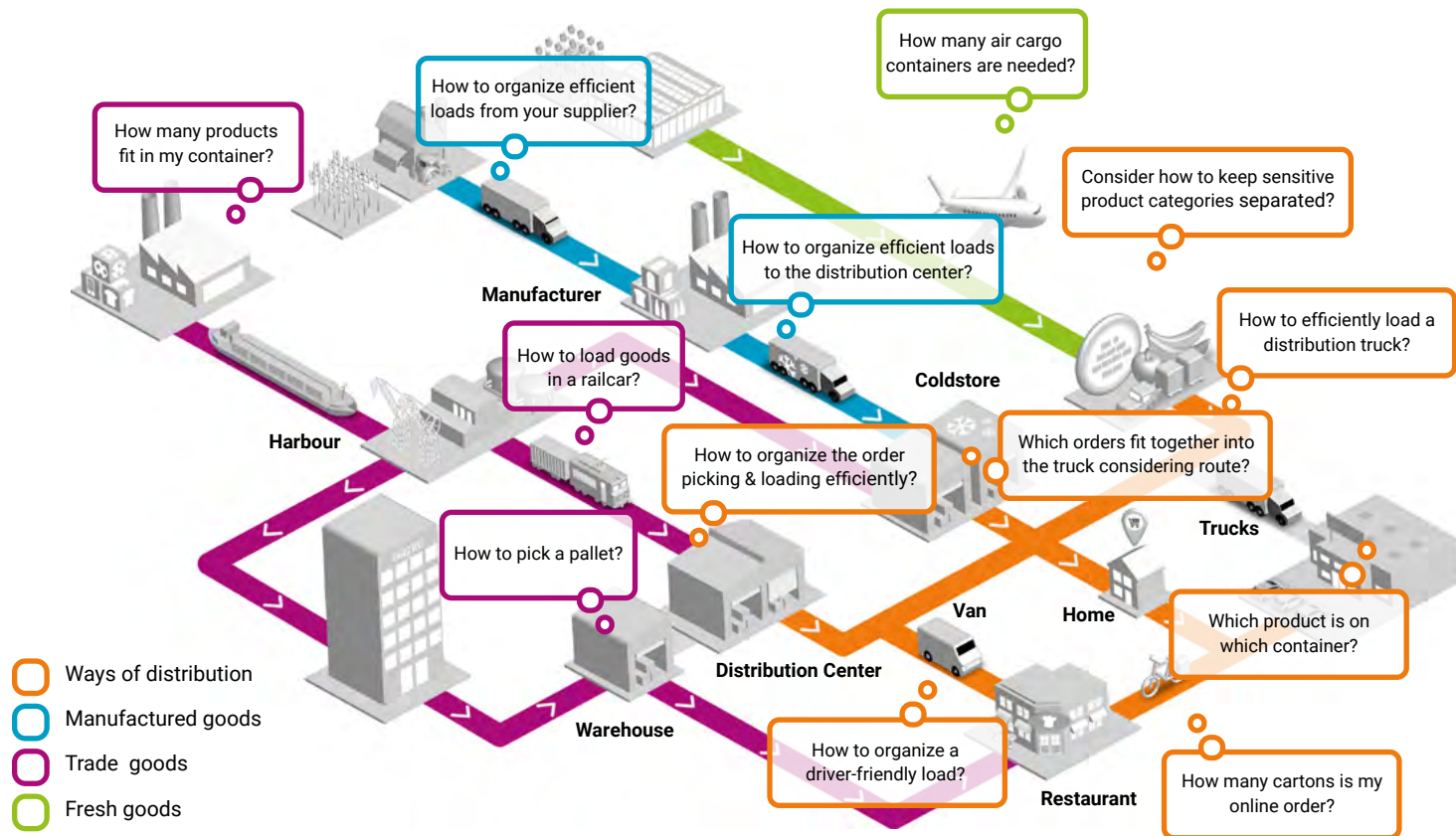


# Packing and loading challenges in your supply chain

For most companies in manufacturing, retail and transportation, logistics costs have a considerable impact on profitability. Transportation and logistics-related costs, as a percentage of sales, range from 9% to 14% depending on the industry. Optimized packing and loading can lead to improved fill rates, carrier selection and/or means of transport, helping you reduce logistics costs.

## A complex equation

How many products fit per container? How should I organize loads at DCs for picking and loading efficiency? Which orders will fit into a given truck considering the route? How can I respect product-related constraints and create secure, stable loads for the best fitting vehicle types? When are the maximum limits for axle weights reached? If you face questions like these on a daily basis, you know it can be hard to arrive at an optimal mix for your packing and transportation units. To meet the challenge in today's complex supply chain landscape, you need advanced decision support.



*A fast and flexible process to determine the exact number of shipping and transportation units needed before any physical packaging has started.*

# Logistics optimization for packing and loading

ORTEC's packing and loading software is setting new benchmarks with its advanced 3D load optimization capabilities. It helps you maximize fill rates while considering all packing and loading strategies and rules in your supply chain.

## The optimal loading scenario - in seconds

Using the best algorithms available in the market, ORTEC's packing and load optimization software helps you pack items in cartons, build pallets, and load trucks or containers in the most efficient way. Decision-ready proposals, presented in interactive 3D graphics, enable you to make the right decisions almost instantly.

## Fit-for-purpose, not "one-size-fits-all"

When it comes to packing and loading, there is no "standard." Every company has unique challenges given their products, packages, shipping processes, and legal and organizational rules. ORTEC's packing and loading software is used by many companies - large and small, across the globe, and in different industries. The flexibility to adapt to industry-specific needs and the ability to use it for various business scenarios are key reasons that make us their vendor of choice.

## Unveil opportunities

Improve loads for inbound transportation, internal movements and customer shipments to unveil opportunities for logistics optimization - from faster processing times to reduced transport units. Companies using our packing and load optimization solution see numerous benefits.

- Better fill rate
  - Up to 7% improvement in shipping and transport asset utilization
- Less planning time
  - Up to 70% reduction in planning times, compared to manual planning
- Lower risk of damage
  - Prevent damage to goods with an improved load fit
- More customer satisfaction
  - Streamline transport to drive customer happiness







## Use it for many business processes

### Scenario 1: Order sizing for full-truck loads (FTL)

How often do sales or purchase orders in your business fill a complete truck? Are three quarters of a truck filled more likely? From a volume perspective, these orders are not very suitable for an efficient shipping and transportation process. What if you could see the exact number of trucks, pallets and cartons needed during order entry and receive a proposal for optimized shipping and transportation units? Our users find that order sizing enables them to better meet customer and vendor requirements by building orders with higher 'real' truck fill rates. In addition, the graphical 3D visualization of the truck load helps customers quickly understand the different loading opportunities, and add or remove products to arrive at optimal truck loads.

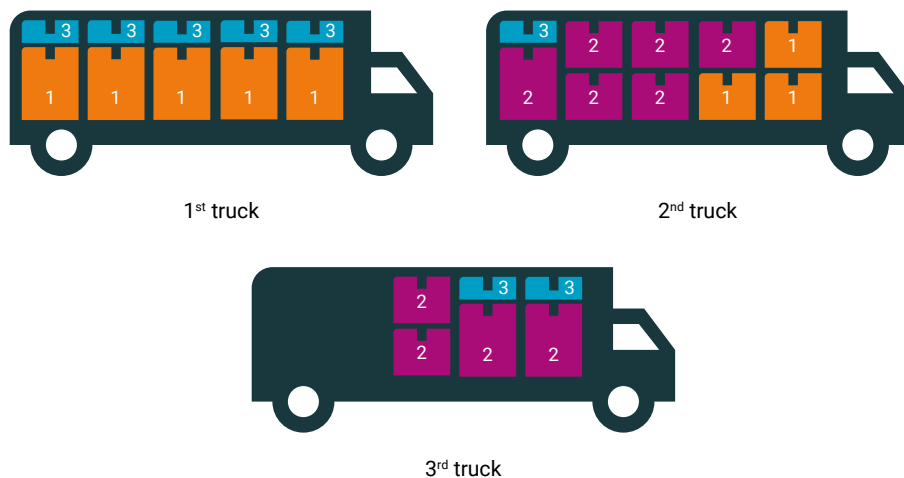
### Scenario 2: Order sizing for less-than-truck loads (LTL)

Companies using freight forwarders for small to medium-sized shipments know that these tend to have higher freight rates compared to full-truck loads. The more accurate your actual required cargo size is, e.g. in loading length or floor spots, the more accurate the quote your freight forwarder provides. ORTEC's packing and load optimization solutions take out the guesswork by providing optimized packing and loading proposals with additional information on total load weight and volume, as well as dimensions, including the possibility to stack packages.



## Scenario 3: Priority-based loading for dynamic replenishment

Supply chains are becoming more demand-driven in order to optimize inventory levels and product availability for both distribution centers and customers. What if you could maximize truck utilization for replenishment between your production plants and distribution centers? How? By focusing on shipping the high priority products to better manage inventory levels, instead of “pushing” products through the supply chain. ORTEC’s packing and load optimization solutions calculate the best truckload proposals based on individual loading priorities for each product. All high priority products (Must-Gos) will be loaded first. The algorithm then calculates the best loading order for lower priority products (Can-Gos) to maximize the use of existing truck space.



## Scenario 4: Splitting large orders

In some situations, retailers or customers place very large orders and leave it to the manufacturer to split them into efficient delivery transports. Such orders can consist of many different products and quantities, partially constrained by certain delivery date periods. ORTEC’s packing and load optimization solutions allocate the products and quantities to different truckloads, considering physical and organizational rules, in order to minimize the total number of required transport units.



## Scenario 5: Combine routing and loading

In transportation scenarios where trucks make multiple stops, ORTEC's packing and load optimization solutions help you size the different orders, providing detailed information on how they will fit into the truck and considering a loading and unloading sequence that is based on your route. The solution can be used in combination with ORTEC's routing solutions or integrated with your existing route scheduling system. This combination can effectively reduce interruptions in your operations. For example, when a load does not fit on the truck, or when a driver wastes time during the tour by re-organizing the load at every stop.

## Scenario 6: 3PL performance evaluation

Companies which have outsourced their warehouse and/or transport operations to a third-party logistics service provider usually evaluate their performance against the service level agreement. Often, you cannot easily determine whether your 3PL vendor can build less cartons or pallets, or use less trucks. With ORTEC's packing and load optimization solutions, companies can optimize their orders and shipments and compare them with the actual output of their 3PL. If the 3PL achieves their optimization potential by using the planned proposals for execution, this results in a win-win situation.



$e^x$

$\frac{1}{\pi}$

$\pi$



# Best-in-class functionality

ORTEC's packing and load optimization solutions offer numerous optimization possibilities and extensions.



- Consider real product dimensions and weight, using constraints such as stacking rules, allowed orientations, and compatibility with other products.
- Consider multiple optimization objectives, such as minimize load volume, or load length, cost, and others.
- Define your own load carriers and means of transport, such as carton, box, pallet, various truck types (standard, double decker with beams, double decker with single floor, gooseneck, semi-trailer), various container types (standard, open-top, flat rack), railcar, and air cargo containers.
- Optimize for a single load carrier or means of transport, or find the best mix out of multiple (e.g. 20' and 40' containers).
- Override general rules for individual orders, such as maximum pallet load height, or use separator pallets between different product layers.
- Create secure and stable loads by considering axle weight and center of gravity.
- Use the result as instructions for your execution in the warehouse.



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# Optimize multiple levels and different modes of transport

Whether you need to pack cartons, optimize pallets or select the best possible container type, ORTEC has the solution. ORTEC's packing and load optimization solutions offer three modules to manage each of these tasks. All modules can be used individually or combined in sequence to create a powerful multi-level packing optimization solution.



## Step 1 - Carton optimization

### Packing cartons

The carton optimization module calculates the number of cartons required to ship items on an order-by-order basis. Use it to determine the most efficient carton type mix for packing while taking various constraints into account.

## Step 2 - Pallet optimization

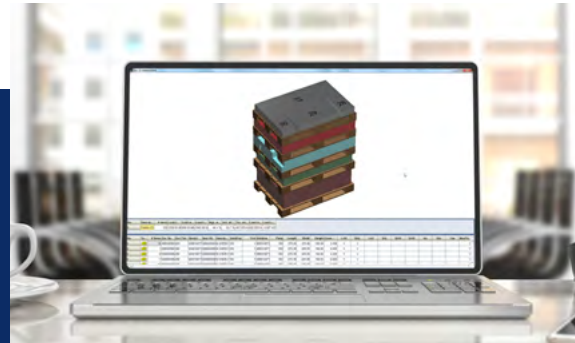
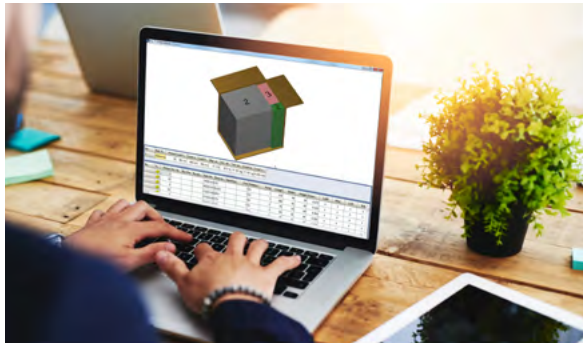
### Packing pallets

The pallet optimization module calculates the number of pallets required to ship items. Use it to build as few pallets as possible while taking multiple constraints into account.

## Step 3 - Load optimization

### Loading into trucks, containers, railcars, air cargo containers

The load optimization module calculates the optimal number of transport units required to load items and can also determine the most efficient vehicle type. Leverage it to use as few vehicles as possible while taking multiple constraints into account.



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# Our software solutions

## ORTEC Load Building

Carton, pallet, truck and container load optimization, available as Windows® Desktop Application

## ORTEC Load Building for SAP® ERP and SAP S/4HANA®

Carton, pallet, truck and container load optimization, available as certified add-on for SAP ERP or SAP S/4HANA

## ORTEC Load Optimization

Carton, pallet, truck and container load optimization, available as cloud-native web applications and web services



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