

# Capacity optimisation in terminal operations



**Optimise load factor systematically with double-stacking of  
pallet goods – for the sake of your bottom line and the environment.**

### Capacity optimisation of cargo in a terminal-to-terminal flow (hub-hub)

There's a great societal focus on the challenges faced by the transport sector and its clients today. Clients and society at large are demanding greener, cheaper and more efficient transportation. What they're asking for is capacity optimisation.

The logistics sector is challenged on many fronts: the climate crisis, the effects of the Covid-19 pandemic, a shortage of truckdrivers, and the increasing amount of goods to be transported as a result of the explosive growth of eCommerce. These challenges have sent shipping and fuel costs sky-high and created a global supply chain crisis while pressure persists from all sides for heavy transports to reduce its environmental footprint.

The green transition is an enormous challenge for the logistics sector. Many continue to find green technologies a risky investment, either because those technologies are not commercially scaleable, or because doubts remain whether they're as effective as promised. And green solutions may still be expensive and not sufficiently supported by existing and proven infrastructure.

There are other ways to optimise, however. Some of the mentioned challenges can be met if the cargo area in trucks is better utilised and filled, and the docks in cargo terminals are optimised and standardised. The task at hand is to find a way to use that empty space that remains in every cargo area, and if you can reduce your need for storage and the time it takes to pack, load, and unload your trucks, all the better.



**22%** efficiency increase at PostNord with an average of 7.3 SpacelInvader double-stacks pr. transport.

PostNord Logistics optimising general cargo with SpacelInvader on their routes in Denmark between Aalborg, Aarhus, Herning, Taulov and Køge.

In Denmark, trucks have a average vehicle fill rate of 56% (ITD). That's better than just a few years ago, where that number was 38%, but there's still a lot of room for improvement, even on hub-hub runs, that are already optimised. But there's potential for even greater optimisation – for the benefit of your bottom line and the environment.

### What's the solution here and now?

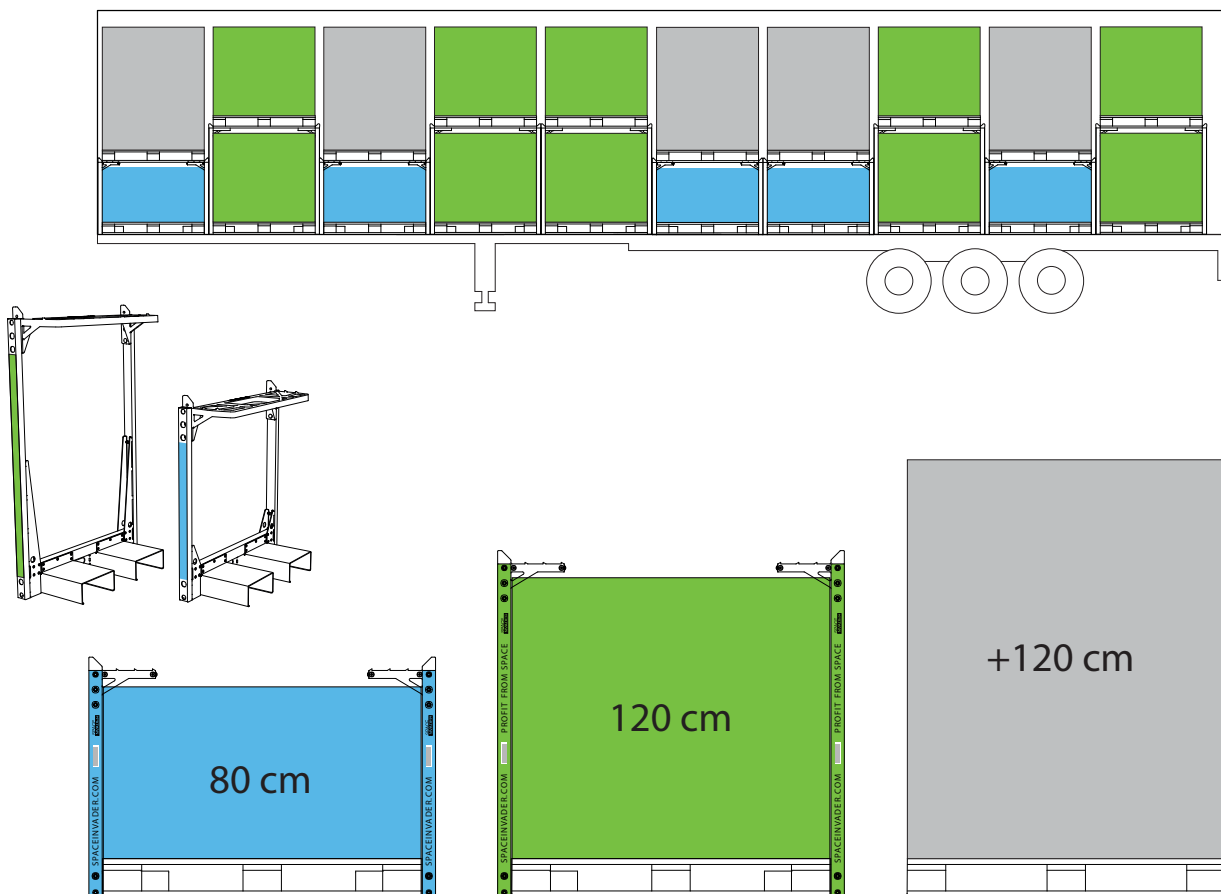
There's great value in optimising the freight aboard every truck. In praxis, it mens putting more cargo on every truck, so its vehicle fill rate is increased through capacity optimisation. SpacInvader has developed an innovative and modular transport- and double-stacking system which consists of pallet racks. With this system you can realise significant capacity improvements and value gains throughout your logistics chain. The same is true for transport between production- and distribution terminals (hub-hub), including route-based transport of semi- and finished products from site of manufacture to temporary storage, or all the way to the distribution terminal.

### Aren't we already fully optimised?

You're probably thinking: how do we put more goods in our trucks or containers when we have already optimised our cargo in a well-integrated logistics flow? Between cargo- and distribution terminals, for example?

The deciding factor remains the vehicle's rate of fill. Is there more room, if you double-stack all your cargo on pallets? Naturally, a lot of factors are at play in how you optimise cargo capacity: available tools, be it soft- or hardware, handling time, load- and unloading flow, machine handling, and of course the employees involved. All factors influence how much cargo can go on every truck.

The SpacInvader system can help optimise pallet goods transportation in a terminal-to-terminal or hub-hub scenario, because the solution enables double-stacking of cargo, including cargo that is fragile, dangerous, or valuable. That's how you make better use of the capacity in your cargo area. That also goes for cargo you wouldn't normally stack. And it's not just



*With two standard rack heights (indicated in blue and green respectively) you're able to optimise most cargo stacks. We call it "two sizes fit all".*

in the truck itself, as you can find those same tangible improvements everywhere else you handle pallets in the supply chain.

### Value proposition

The rack can increase the pallet's total cargo height to 240 cm. through double-stacking, resulting in a significant marginal gain. On a yearly basis you can generate big value within your transportation budget, both in terms of savings and environmental optimisation.

**Example:** double-stacking only 6 pallets results in a direct efficiency increase of 18% on only 1 delivery (6 pallets/33 pallet positions = 18%). In a scenario where the six pallets were to be driven in a separate delivery, as so-called surplus pallets, you can save this entire extra trip.

**Example:** After more than two years of using Space-Invader, PostNord Logistics' own studies have shown they have an average of 7.3 double-stacked pallets on every run they make. Taken together, that means Post-Nord has an efficiency increase of 22% on those hub-hub routes, where SpacInvader is in use.

### Optimisation on the dock

With the SpacInvader system you're optimising cargo even before loading and not during. That gives you more space on the dock and a quicker and more standardised handling of cargo. Loading and unloading is made more mechanised when pallets are double-stacked and readied with stackers or forklifts on the dock itself. It all contributes to a better use of space available and vehicle fill rate in the truck.

The optimised preparation on the dock also raises the possibility for a more flexible production flow for a manufacturer. The cargo can already be packed during its manufacture so it's fully optimised on the dock.

### Fewer trucks and less damaged cargo

At the same time, trucks that are filled better lead to a reduced need for added shuttles on individual hub-hub deliveries.

Another benefit is the amount of damaged goods is reduced, because the cargo is optimally packed and therefore better protected. That's because the racks and pallets combine to protect the cargo.



*Floor space is significantly optimised along with loading times when cargo is readied directly on the dock.*

Reducing the amount of damaged cargo means a reduced need to return damaged goods, ultimately resulting in fewer extra runs or lost shuttle capacity.

### Better ergonomics benefits everyone

The ergonomical element is also a deciding factor. That's because the cargo is optimized as early as on the dock itself, where it's packed and stacked higher and more

stable by using stackers or forklifts, for example. It reduces the amount of manual handling, in both the trailer itself and in containers, compared to double stock or manually stacking.

When the cargo is maximally optimised on the dock, it's easy to load the trailer or container with a forklift or stacker. In your daily operations, you'll find you can load

## VELUX®

Velux drives terminal to terminal (*hub-hub*) transports between Kolding and Hedehusene in Denmark. The route is 245 km. long. Their cargo is window frames, which thanks to the SpaceInvader racks can now be transported lying down while better protected. Previously, the window frames were transported standing up. Velux can therefore transport more frames on every run they make.

### Benefits

Velux saves 333 metres of cargo area with the SpaceInvader solution, the equivalent of 100 trucks on a yearly basis. They also avoid paying for 20 extra transport runs. The operational savings are 16.6% yearly. Add to that the reduction in CO2 which Velux attains by avoiding those 20 extra runs they would otherwise have needed to make. They also save costs (*and spare the environment*) by using less packaging materials, as they otherwise would need in order to protect the window frames.

## postnord

PostNord Logistics use SpaceInvader on hub-hub routes between their terminals in Aalborg, Aarhus, Herning, Taulov, and Køge in Denmark. The solution is used to transport packages in a variety of sizes, shapes and weights. When PostNord conducted a pilot study using the SpaceInvader solution over a period of four months, they saved 200 runs on their hub-hub routes alone between Taulov, Herning and Køge. Today the solution is implemented across the company.

### Benefits

Based on the results from the pilot study, PostNord saves 600 runs on average on a yearly basis, the equivalent of a CO2 reduction of 12,8%. Beyond capacity optimization in their trucks, the solution has also been proven to have a beneficial effect in the terminals, as the double-stacked cargo takes up less space in PostNord's distribution and line haul boxes.



In Norway, candy maker Brynhild uses the SpaceInvader solution to transport cargo between its factory in Frederikstad and Leman's 3PL warehouse in Vestby. The route is 45 km. Brynhild had several challenges with optimising its capacity on the loading dock at the factory and was looking for a solution that would help them double-stack cargo without risk of damaging cargo and breakage. Brynhild tested the SpaceInvader solution with 30 sets as part of their daily operations.

### Benefits

Brynhild gained 40 pallet spaces weekly, and thereby saved 1.5 truck deliveries every week. Brynhild optimised its capacity on the terminal dock and was also able to double-stack cargo they couldn't previously. They save time, when they load their cargo on Leman's trucks, as they can now load four pallets at a time. At the same time, they've reduced the amount of damage to cargo, because it's now better protected by the SpaceInvader racks.

Examples of operational gains for clients in manufacturing, transportation and FCMG.

and unload significantly quicker for the same reason, as everything is optimized and readied right on the dock.

### Optimisation throughout your workflow

It's possible to maximize the effect of the SpacelInvader solution for an optimal experience by integrating the pallet racks in your entire logistics flow. Carriers can also sort their cargo in their own hub network, which means cargo is optimised throughout the logistics flow, all the way through to the last mile when arriving at the end destination.

### Operational flexibility

If you're using SpacelInvader racks, you have flexibility in how you use those racks that aren't tethered to each individual trailer or truck, but can be used independently on all types of trucks, on all types of deliveries. You can also keep them on hand in the terminal, where you use them as required. The racks are stackable, and you stack 20 racks on a single pallet, thereby taking up little space when not in use, both at the terminal, and while on the return run. It's therefore quite easy to implement SpacelInvader.

As for handling the racks when they're to be returned, in a hub-hub scenario, they're often used to double-stack new cargo on the following distance. If they're not in use following arrival at the destination, their clever design lets you stack 20 racks on a single pallet when making the return run to your point of origin.

### Double stock or SpacelInvader racks?

You can optimise capacity in several ways. The most widely known solution today is probably double stock. SpacelInvader is now an alternative or supplemental tool to double stock. We've produced a business case, which outlines and details the pros and cons of using double stock and the SpacelInvader solution. *Contact SpacelInvader for more information.*

### Want to try it for yourself?

Book a pilot study to find out if the SpacelInvader solution is right for you. It's simple and requires little preparation time. In collaboration with you, we identify an area of focus where we'll test the solution over a few months. That way you get concrete evidence and measurable insight into the gains you stand to make by using SpacelInvader. *Contact SpacelInvader for more information.*

You're always welcome to contact us directly at +45 7070 7228 or at [hello@spaceinvader.com](mailto:hello@spaceinvader.com) if you wish to receive more information about how SpacelInvader can optimise your hub-hub transport operations.

### About SpacelInvader

SpacelInvader, founded in 2015, is Danish green-tech company that's part of the circular economy and helps the transport- and logistics industry optimise cargo capacity. SpacelInvaders climate solution produces documented CO2 reductions within the supply chain and a ROI up to 400%. With its patented pallet rack system, the SpacelInvader solution enables stable and safe double-stacking of pallet cargo in trucks, storage facilities and at the destination. The solution reduces key costs in the logistics chain: low

rate of vehicle fill and empty runs. The SpacelInvader system also has a documented positive climate effect through reductions in CO2 and NoX typically ranging from 10-30%. When the solution is implemented, you reduce both the number of kilometres driven, and the number of trucks used. Following the implementation of the SpacelInvader solution, PostNord Logistics saved every eight truck used as part of its line haul operations.

Read client cases and more about the SpacelInvader solution at [www.spaceinvader.com](http://www.spaceinvader.com)