Palletising: Efficient Load Carrier and Transport Optimisation in Industrial Procurement

Palletising refers to the systematic arrangement and securing of goods on pallets to optimise transport, storage and handling. For buyers and supply chain managers, it is a key lever for logistics costs, space utilisation and delivery reliability. The term covers both the technical execution and the coordinated agreements with suppliers on load carriers, stacking patterns and packaging requirements.

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Key facts at a glance

01 Palletising covers stacking patterns, load carrier selection, securing and labelling of goods on pallets.

02 In practice, optimised palletising typically saves 10–30 per cent of loading space.

03 The Euro pallet (800 × 1,200 mm) is the most commonly used standard load carrier in the DACH region.

04 Palletising requirements often belong in requests for quotation, price sheets and logistics annex documents.

05 KPIs such as pallet utilisation rate and damage rate make the quality of palletising measurable.

06 Structured load carrier management governs the exchange, return and loss of pallets between supplier and customer.

Definition: Palletising

Palletising is the systematic assembly of goods into storable and transportable loading units on pallets. It includes the choice of load carrier, the definition of stacking patterns, load securing as well as the marking and labelling of the loading unit. In industrial procurement, palletising is part of the logistics requirements that are established contractually and in suppliers' terms of delivery.

Distinction from packaging and containerisation

Palletising must be distinguished from product packaging: packaging protects the individual product, while palletising combines packaged units into a manageable loading unit. Whereas containerisation relates to intercontinental transport with sea freight containers, palletising is geared towards combined intra-plant and road-bound transport. However, the two levels interact, since carton- and beam-optimised packaging dimensions determine how densely a pallet can be loaded.

Significance for procurement

For procurement, palletising has a dual effect: it directly influences transport costs, which are often anchored in the price sheet or delivery terms (for example in FOB arrangements), and it determines the handling effort in goods receipt. Those who verify palletising requirements early in enquiries and suitability criteria avoid expensive renegotiations and bottlenecks in transhipment. In addition, uniform palletising facilitates the automation of goods receipt and warehousing.

Methods and approach of palletising

Professional palletising follows a clearly structured approach: first, the dimensions and characteristics of the goods are analysed, on that basis the stacking pattern is calculated, and finally load securing and marking are defined. CAD-supported palletising software and cubing calculators assist in this; in practice, however, a systematic calculation based on base areas and stacking heights is often sufficient.

Stacking patterns and utilisation optimisation

The stacking pattern defines how cartons or containers are distributed across the pallet surface. Common patterns are block patterns, cross patterns and pinwheel arrangements; the choice depends on carton dimensions, stability and the degree of automation. The goal is high surface utilisation with sufficient stability. In practice, utilisation rates of over 85 per cent of the pallet base area are considered good; below that, every transport incurs unnecessary costs per volume unit.

Load securing and transport protection

For load securing, stretch film, strapping band, anti-slip mats and pallet hoods are used. The securing must withstand the acceleration forces in road and combined transport and is frequently regulated in binding loading instructions. For safety-critical or heavy goods, additional intermediate layers or edge protection profiles are common. The choice of securing influences not only safety but also sustainability and disposal costs, which is why aspects such as the recyclability of packaging are increasingly being factored in.

Marking and labelling

Every pallet loading unit requires unambiguous marking with article number, quantity, batch reference and standardised transport labels. Barcodes or RFID labels enable automated goods receipt posting and improve traceability in supply planning. Missing or incorrect labels are a common cause of delays

and returns in goods receipt and should be recorded in supplier evaluations.

Palletising requirements in the procurement process

For palletising requirements to take effect, they must be integrated into the procurement process at an early stage. This begins with the enquiry, continues in the bid evaluation and culminates in binding logistics annex documents to the contract. In this way, a technical detail question becomes a steerable performance criterion.

Requirements in enquiries and price sheets

In tenders and enquiries, the pallet type, maximum permissible pallet height, weight limit, stacking pattern requirements and labelling standards should be specified concretely. In the price sheet, pallet terms, load carrier prices and return obligations can be mapped as separate price positions. This makes negotiating room transparent and ensures that offers from different suppliers are genuinely comparable in the supplier shortlist.

Suitability criteria and supplier verification

When selecting suppliers, the ability to palletise in accordance with the agreement should be checked as a suitability criterion – for example through sample pallets, site inspections or evidence from previous deliveries. A supplier status with evaluated logistics performance makes fulfilment quality continuously visible. Deviations can be systematically discussed as part of the Quarterly Business Review (QBR) and addressed through agreed corrective actions.

Load carrier management and return arrangements

Pallets are valuable assets: exchange or rental pallets require clearly regulated exchange and return processes. Structured load carrier management documents stock levels, governs balance settlements between the partners and avoids disputes over missing load carriers. For reusable multi-trip systems, pool systems with nationwide exchange rights are common in practice, while one-way pallets raise disposal and cost issues.

Key KPIs of palletising

Palletising is measurable. Selected KPIs show whether load carriers, stacking patterns and load securing are operating economically and where optimisation potential lies. Regular evaluations are well suited as a basis for supplier discussions.

Utilisation and cubing KPIs

Key metrics are the pallet's floor space utilisation rate, the volume utilisation rate of the truck or wagon, and the number of loading units per shipment. If utilisation declines over several periods, this indicates changed packaging dimensions, impermissible mixed pallets or uncoordinated partial deliveries. These KPIs can be derived directly from freight invoices and package data.

Damage and process quality KPIs

The damage rate per shipment, the number of pallet deviations in goods receipt and the labelling error rate describe the process quality of suppliers. Rising damage rates require a bottleneck analysis in the logistics process: is the cause the stacking pattern, the load securing or the transhipment? The results feed into the supplier status and into the scheduling of subsequent deliveries.

Risks and controls in palletising

Inadequate palletising causes transport damage, loading delays, additional costs and, in extreme cases, liability issues. Clear contractual provisions and ongoing controls effectively minimise these risks.

Typical risks in practice

Common problems are excessive or unstable stacks, mixed pallets unsuitable for transport, missing load securing, incorrect labels and unclear load carrier accounting. Poor-quality pallets – for example with damaged deck boards – can also cause damage during transhipment. In addition, costs arise when suppliers use containers that are not palletising-compatible and cannot be processed by the recipient's automated systems.

Contractual and operational controls

Contractually, loading instructions, palletising standards and liability issues for transport damage should be stipulated as binding; changes to terms can be addressed via a price adjustment clause. Operationally, sample inspections in goods receipt, loading releases for critical products and a defined approval workflow for new packaging and palletising variants apply. Sustainability requirements such as the recyclability of packaging should be checked within the same control routines.

Current developments in palletising

Palletising is changing as a result of automation, sustainability requirements and digitalised logistics processes. Buyers should follow these developments, as they equally affect transport costs, the availability of load carriers and supplier requirements.

Automation and standardisation

Automatic palletising robots, large carton formats and standardised loading units characterise modern plants on both sides of the supply relationship. The more highly automated goods receipt and warehousing are, the stricter palletising requirements must be observed, as manual corrections are expensive. Buyers should therefore anchor the automation requirements of their plants in new supply contracts.

Sustainability and circular economy

Reusable load carriers, recyclable securing materials and CO-based loading space optimisation are

gaining importance and are increasingly becoming part of supplier evaluations. Topics such as the sustainable product category packaging show that palletising and packaging issues are being treated more strategically in procurement than in the past. Likewise, in globalisation or reshoring (onshoring) decisions, palletising standards influence transport costs and thus the overall evaluation of sourcing alternatives.

Typical metrics

Metric	Typical value
Pallet floor space utilisation	> 85% *Typical guideline value for well-optimised palletising; below this, cost potential lies idle.*
Damage rate per shipment	< 1% *Indicator for load securing and stacking pattern quality; in practice varies depending on the type of goods.*
Pallet deviations in goods receipt	< 2% *Proportion of shipments with non-conformant pallets; well suited as a supplier evaluation criterion.*
Labelling error rate	< 0.5% *Measure for automatable goods receipt processes; should be discussed in QBRs.*

Practical example

A mid-sized mechanical engineering company found that the parts deliveries from one supplier arrived with varying carton sizes and incomplete pallets. Truck utilisation during the relevant period was significantly below the achievable level, and the goods receipt department needed additional repacking time. The company subsequently defined binding palletising requirements and systematically monitored their implementation.

- Specification of standard carton dimensions and a binding stacking pattern in the logistics annex of the framework agreement
- Inclusion of palletising conformity in the suitability criteria and supplier status
- Introduction of a monthly utilisation and damage report as the basis for the Quarterly Business Review (QBR)
- Agreement of a pooled load carrier system with a regulated exchange within load carrier management

Conclusion

Palletising is far more than a packaging detail: it determines transport costs, handling effort, damage rates and the automation capability of the entire supply chain. Buyers are well advised to integrate palletising requirements early into enquiries, price sheets and contracts and to measure compliance systematically. Sound load carrier management and regular reviews with suppliers ensure the sustainability of the optimisations. Those who treat palletising strategically typically achieve measurable cost savings in practice alongside improved delivery reliability. The easiest way to get started is with an assessment of current pallet utilisation and the most frequent goods receipt deviations.

Frequently asked questions

? What does palletising mean?

Palletising refers to the systematic stacking and securing of goods on pallets to form a transportable loading unit. This includes stacking patterns, load securing, labelling and the choice of load carrier. In industrial procurement, palletising is part of the logistics requirements placed on suppliers.

? What types of pallets are there?

The best-known is the Euro pallet (800 × 1,200 mm); in addition, there are industrial pallets, chemical pallets, pallet cages and one-way pallets made of wood or cardboard. The choice depends on the type of goods, transport route, reusability and the recipient's requirements. For intra-European shipping, the Euro pallet is the de facto standard.

? How much fits on a Euro pallet?

This depends on carton dimensions, permissible stacking height and product weight. Common guidelines are a maximum stacking height of around 1.8–2.2 metres including the pallet for road freight and a floor space utilisation of over 85 per cent for good palletising. Binding requirements should be agreed between supplier and customer on a case-by-case basis.

? What is the difference between palletising and packaging?

Packaging protects the individual product and serves the handling of the sales unit, while palletising combines several packaging units into a single loading unit. Packaging dimensions determine how efficiently a pallet can be loaded. The two topics belong together and should be addressed jointly in procurement.

? Who pays for pallets?

This is a matter for negotiation and should be governed contractually. Common arrangements are exchange pallets with balance-conformant returns, rental pallets via pool systems, or one-way pallets whose price is included in the purchase price. Missing arrangements frequently lead to disputes over missing load carriers and should be avoided through load carrier management.

? How can palletising be optimised?

Starting points include the harmonisation of carton dimensions, the calculation of optimised stacking patterns, improved load securing with less material usage and the agreement of binding palletising requirements with suppliers. KPIs such as utilisation rate and damage rate show progress. In practice, optimisations often pay for themselves quickly through saved transport and handling costs.

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