

C-Parts Explained — ABC Classification, Total Cost of Ownership and Supply Models (Kanban, VMI, Consolidation)



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C-parts are the low-value, high-volume items every plant, yard and workshop consumes without thinking about them: bolts, screws, nuts, washers, pins, rivets, retaining rings, plugs, cable ties, O-rings. In an ABC analysis by purchase value they sit in class C — typically 60–80 % of all part numbers and 5–10 % of annual spend — yet each of those part numbers still needs a purchase order, a goods receipt, a stock location, a pick and a line-side bin. The administrative and handling cost per line is therefore roughly the same as for an A-part costing a thousand times more, which is why the total cost of owning a C-part is normally two to five times its price. Managing C-parts is not a purchasing problem; it is a process-design problem.

Supply model	Who owns the stock	Replenishment trigger	Admin load per line	Best fit	Watch-outs
Direct purchase (PO per need)	Buyer, after receipt	Requisition	Highest — PO, receipt, invoice per order	One-off, non-repeating parts	Stock-outs and expediting; every line costs 30–80 € to process
Blanket order + call-off	Buyer	Call-off against annual quantity	Medium — one PO, many receipts	Stable annual consumption, few suppliers	Forecast error; price locked while volumes drift
Two-bin kanban	Buyer (bins on site)	Empty bin returned or scanned	Low — no requisition, fixed lot	Shop floor, assembly cells, maintenance stores	Bin sizes must be recalculated when takt or BOM changes
Vendor-managed inventory (VMI)	Supplier until consumption	Supplier counts / scans on schedule	Very low — consolidated monthly invoice	Sites with 500+ C-part numbers and one dominant supplier	Contractual min/max levels, consumption reporting, exit clause
Single-source consolidation	Depends (often supplier)	Combined kanban / VMI across all C-parts	Lowest overall — one supplier, one logistics loop	Multi-site groups standardising parts and finishes	Supplier dependency; needs a QA-audited partner (ISO 9001, ISO 16426)
Line-side supermarket	Buyer	Pull from supermarket, replenished by milk run	Low	High-volume assembly lines	Space and discipline; combine with kanban upstream

Classifying the portfolio

- ABC by value — rank part numbers by annual spend. A "H top 10–20 % of numbers / 70–80 % of value; B "H next 20–30 % / 15–20 %; C "H remaining 50–70 % of numbers / 5–10 % of value. C-parts are defined by this cut, not by what they are.
- XYZ by demand regularity — X = steady (coefficient of variation < 0.5), Y = seasonal or trend, Z = sporadic. CX and CY items suit kanban and VMI; CZ items (a special M27 stud used twice a year) suit a blanket order with a safety stock, not a bin.
- Criticality overlay — a €0.20 washer that stops a €5 M line is still a C-part by value but must be treated as critical for availability: higher safety stock, dual source, or a consolidated supplier with guaranteed lead time.
- Standardisation — every non-standard C-part (special finish, special length, DIN where ISO exists) multiplies stock locations. Migrating to ISO standard parts and to one finish family per corrosion class typically cuts 20–40 % of fastener part numbers.

Total cost of ownership — where the money goes

For a typical industrial C-part the purchase price is the smallest slice. Published supply-chain studies and supplier data put the process cost of a purchase order line at €30–€100 (requisition, ordering, receiving, inspection, booking, invoice matching), storage and handling at 10–20 % of stock value per year, and the cost of a stock-out (line stop, expediting, air freight) far above both. A €0.10 screw ordered 12 times a year on its own PO line costs the organisation several hundred euros in process cost. The lever is therefore the number of transactions and touches, not the unit price — which is why kanban, VMI and consolidation pay back even when the unit price is slightly higher than the cheapest spot quote.

Specification checklist for a fastener line

- Standard and form — e.g. ISO 4014 (partially threaded hex bolt) vs ISO 4017 (fully threaded); DIN 931/933 legacy designations map to these but with different across-flats sizes on M10–M14 and M22 (see the DIN!ISO migration guide).
- Thread — nominal diameter and pitch (M12 coarse = 1.75; fine = 1.5 or 1.25), hand (left-hand where specified), tolerance class (6g bolts / 6H nuts; 6az/6ax for hot-dip galvanised nuts).
- Property class or grade — 8.8, 10.9, 12.9 to ISO 898-1; nuts to ISO 898-2 (class "e first figure of the bolt class); stainless A2-70, A4-80 to ISO 3506-1.
- Surface finish — plain, zinc electroplated (ISO 4042, with thickness and passivation), zinc flake (ISO 10683), hot-dip galvanised (ISO 10684), Zn-Ni, phosphate. State the corrosivity category (ISO 12944 C2–C5) the finish must survive.
- Certificates — EN 10204 type 2.1 (declaration of compliance), 2.2 (test report, non-specific), 3.1 (inspection certificate on the delivered batch, issued by the manufacturer's independent department), 3.2 (as 3.1, countersigned by an independent inspector or class surveyor). Marine and pressure applications usually need 3.1; class-society scope needs

3.2.

- Packaging and identification — bulk or bagged, pieces per pack, label content (standard, size, class, batch, manufacturer ID), RoHS / REACH declarations, country of origin for customs (HS 7318).

Quality systems and traceability

ISO 9001 certification of the supplier is the baseline. ISO 16426 (fasteners — quality assurance system) defines the fastener-specific requirements, including batch traceability from steel heat to shipped carton, marking of property class and manufacturer identification on the head or nut face, and sampling plans for mechanical tests. For safety-relevant joints (lifting, structural, pressure), specify the certificate type at order and retain it with the maintenance record — the certificate is only useful if it can be tied to the installed batch.

Practical rollout of a C-parts programme

- Take one year of consumption per part number; run ABC/XYZ; freeze the C list.
- Rationalise: one standard (ISO), one finish per corrosion class, one packaging unit; delete legacy DIN duplicates.
- Choose the supply model per XYZ class; size bins on lead time + safety factor, not on last year's peak.
- Put the supplier under a service-level agreement: fill rate, lead time, batch traceability, certificate turnaround.
- Measure: number of PO lines, stock-outs, inventory turns, and the count of active fastener part numbers — all four should fall.

Values are nominal reference data compiled from the cited standards and supplier catalogue data (Bofab). Confirm against the controlling standard revision, the manufacturer's data sheet and the joint calculation before procurement or assembly. © cBallast 2026 · cballast.com