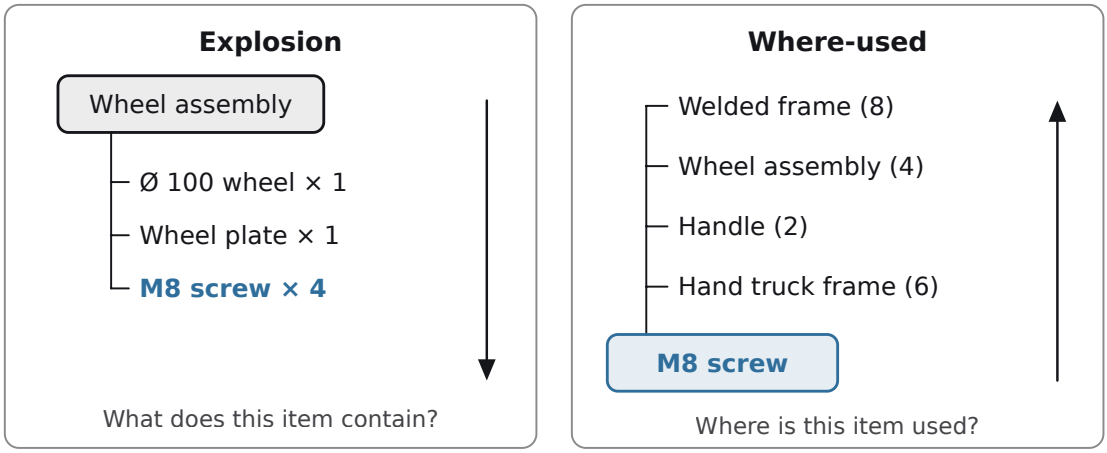
PRINTABLE REFERENCE CHART

Where-used in a bill of materials: a complete example

BAOUCH.FR
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1. The BOM read upwards



Key point: **a BOM is stored on the parent**. The assembly knows its components; the part does not know where it is used. A where-used is therefore always a **computation** over all the BOMs (an inverted index). That is why a standalone Excel file or a CAD system without a database cannot answer it, while a PDM, PLM or ERP system does it in one query.

View	Question	Result
Single-level where-used	Which items contain this component directly?	The direct parents, with the quantity per parent
Multi-level (indented) where-used	Through which paths does this component reach the finished products?	The inverted tree, level by level
End-item where-used	In which finished products, and how many times?	One line per product, quantities summed over all paths

2. The worked example: one screw, two products

We take the cart from the multi-level BOM article and add a second product, a hand truck, which shares the wheel assembly and the M8 screw. The single-level BOMs are:

Parent	Components (quantity per parent)
Cart	Welded frame × 1, wheel assembly × 4, handle × 1
Hand truck	Hand truck frame × 1, wheel assembly × 2, nose plate × 1
Welded frame	40 × 40 tube × 4, **M8 screw × 8**
Wheel assembly	Ø 100 wheel × 1, wheel plate × 1, **M8 screw × 4**
Handle	Ø 25 tube × 1, **M8 screw × 2**
Hand truck frame	Ø 25 tube × 2, **M8 screw × 6**

Single-level where-used of the M8 screw

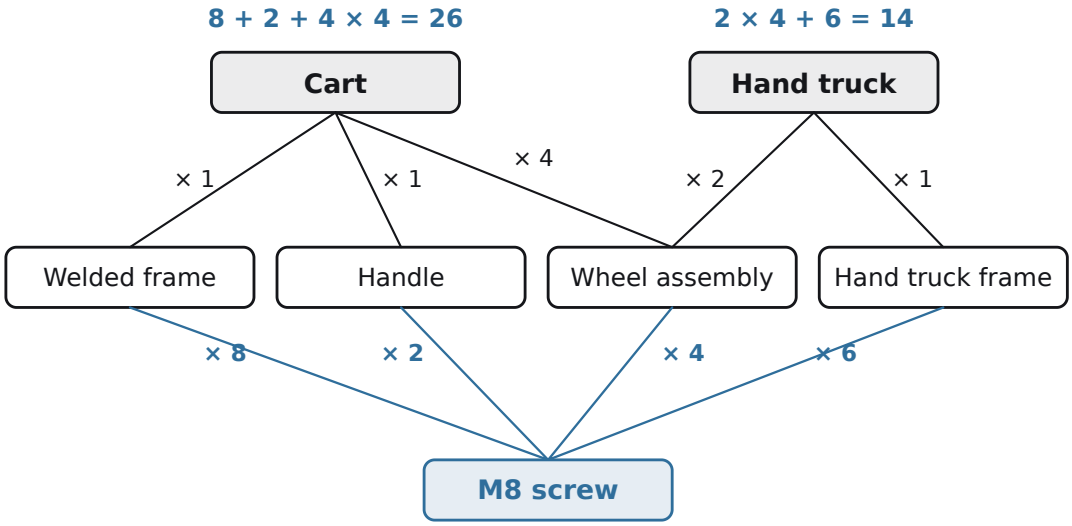
Direct parent	Quantity per parent
Welded frame	8
Wheel assembly	4
Handle	2
Hand truck frame	6

Each level goes one step up. The extended quantity is the number of M8 screws contained in *one* unit of the line's item: multiply the quantities along the path.

Level	Parent item	Qty per parent	M8 screws per unit
.1	Welded frame	8	8
..2	Cart	1	8
.1	Wheel assembly	4	4
..2	Cart	4	16
..2	Hand truck	2	8
.1	Handle	2	2
..2	Cart	1	2
.1	Hand truck frame	6	6
..2	Hand truck	1	6

End-item where-used

Finished product	Paths	M8 screws per product
Cart	8 + 16 + 2	**26**
Hand truck	8 + 6	**14**



4. What where-used is for

Situation	Question asked of the where-used	Useful view
Changing a part	Which assemblies, drawings and products are affected? Is a new revision or a new part number needed?	Multi-level
Obsolete component or failing supplier	Which products are blocked, how many parts are needed to finish current builds?	End items, with quantities
Standardization	Is this part reused? Do two near-identical references each have a single parent?	Single-level
Cleaning the item master	Which items have no parent? (orphans, duplicates, trials)	Single-level, empty result
Spare part	On which delivered machines is this part fitted?	End items

The first use is by far the most important: a change request without a where-used is a change whose impact is unknown. It is the analysis step of an ECR, and it is also what decides between a new revision and

a new part number: if the changed part is no longer interchangeable in *all* its where-used, it gets a new number.

Reference values taken from the article https://www.baouch.fr/en/blog/cas-emploi-where-used-nomenclature/, which explains the assumptions, formulas and edge cases. For critical use, check the current standard or the manufacturer's documentation. Free to print and share with credit to the source.