Low Carbon Steel Specifications (Q195 / Q235)

Steel hand trucks prioritize deformation resistance and cost-effectiveness. The mainframe typically utilizes high-frequency welded tubes, and the core load-bearing areas of high-strength industrial models generally require a wall thickness of 1.5mm or greater.

Shape	Standard Dimensions (OD / Size)	Wall Thickness	Steel Grade	Typical Application	Load Capacity & Performance Reference
Round Tube	Ø 22 mm, Ø 25 mm	1.0 mm, 1.2 mm	Q195 / Q235	Auxiliary tubes, P-handles, horizontal support crossbars	Suitable for 100-150kg light-duty hand trucks or non-load-bearing structural areas.
Round Tube	**Ø 28 mm**, Ø 32 mm	**1.5 mm**, 1.8 mm, 2.0 mm	Q235	Mainframe uprights, primary load-bearing chassis	**Ø 28 mm × 1.5 mm** is the industry standard for achieving a **300kg (660 lbs)** continuous rated load capacity, offering high bending yield strength.
Square Tube	20×20 mm, 25×25 mm	1.2 mm, 1.5 mm	Q195 / Q235	Bottom load-bearing base, wheel bracket connectors	Square tubes provide a larger contact surface during node welding than round tubes, significantly enhancing torsional resistance.

Rectangular Tube	20×40 mm, 30×50 mm	1.5 mm, 2.0 mm	Q235	Platform cart chassis, specialized heavy-duty reinforcements	Provides an extremely high longitudinal section modulus for bending, suitable for large-area load-bearing platforms.
Steel Plate	Width: 240mm - 355mm	3.0 mm, 3.5 mm, **4.0 mm**, 5.0 mm	Q235 (Hot/Cold Rolled)	Toe Plates (Nose Plates), Triangular Gussets	300kg-class industrial hand truck toe plates typically utilize **4.0mm** stamped steel plates, welded with 3.5mm side triangular gusset reinforcements.
Solid Bar	Ø 16 mm, Ø 20 mm	Solid	Q235 / 45# Steel	Wheel Axles	Ø 16mm is perfectly matched with 6204-RS precision bearings. Using 45# carbon steel prevents axle deformation under maximum payload.

Aluminum Alloy Specifications (6061-T6 / 6063-T5)

Aluminum hand trucks are typically 30% to 40% lighter than their steel counterparts. However, to achieve the same structural strength, the wall thickness and outer diameter of aluminum tubes must be increased. High-frequency logistics carts primarily utilize T6 temper 6061 aircraft-grade aluminum.

Shape	Standard Dimensions (OD / Size)	Wall Thickness	Aluminum Alloy	Typical Application	Load Capacity & Performance Reference

Round Tube	Ø 25 mm, Ø 28 mm	1.5 mm, 2.0 mm	6063-T5	Auxiliary handles, telescopic trolley rods	6063 offers excellent extrusion formability and exceptional surface treatment (e.g., anodizing) results.
Round Tube	Ø 32 mm, Ø 35 mm	2.5 mm, 3.0 mm	6061-T6	Heavy-duty aluminum cart mainframes	6061-T6 features high tensile strength. A 3.0mm wall thickness is structurally sufficient to support a 200kg - 250kg continuous working load.
Extruded Profiles	40×20 mm, 50×30 mm, profiles with guide channels	2.5 mm - 3.0 mm (stress-bearing faces)	6061-T6	Vertical uprights, modular base frames, stair-climbing cart main tracks	Aluminum hand trucks frequently utilize **Modular Bolted Construction** instead of full welding, using custom extruded profiles with internal reinforcement ribs.
Die-Cast Plate	Widths: 280mm, 450mm, etc.	**6.0 mm - 8.0 mm** (at edges and ribs)	A380 / ADC12	One-piece heavy-duty toe plates	Die-cast parts have varying thicknesses but offer extreme root load-bearing strength. They often feature hollow grid designs to further reduce dead weight.
Extruded Plate	Widths: 185mm, 225mm	5.0 mm, 6.0 mm	6061-T6	Folding Nose Extensions	Offers extremely high surface flatness and toughness. It is less prone to brittle fracture than die-cast aluminum upon heavy impact.