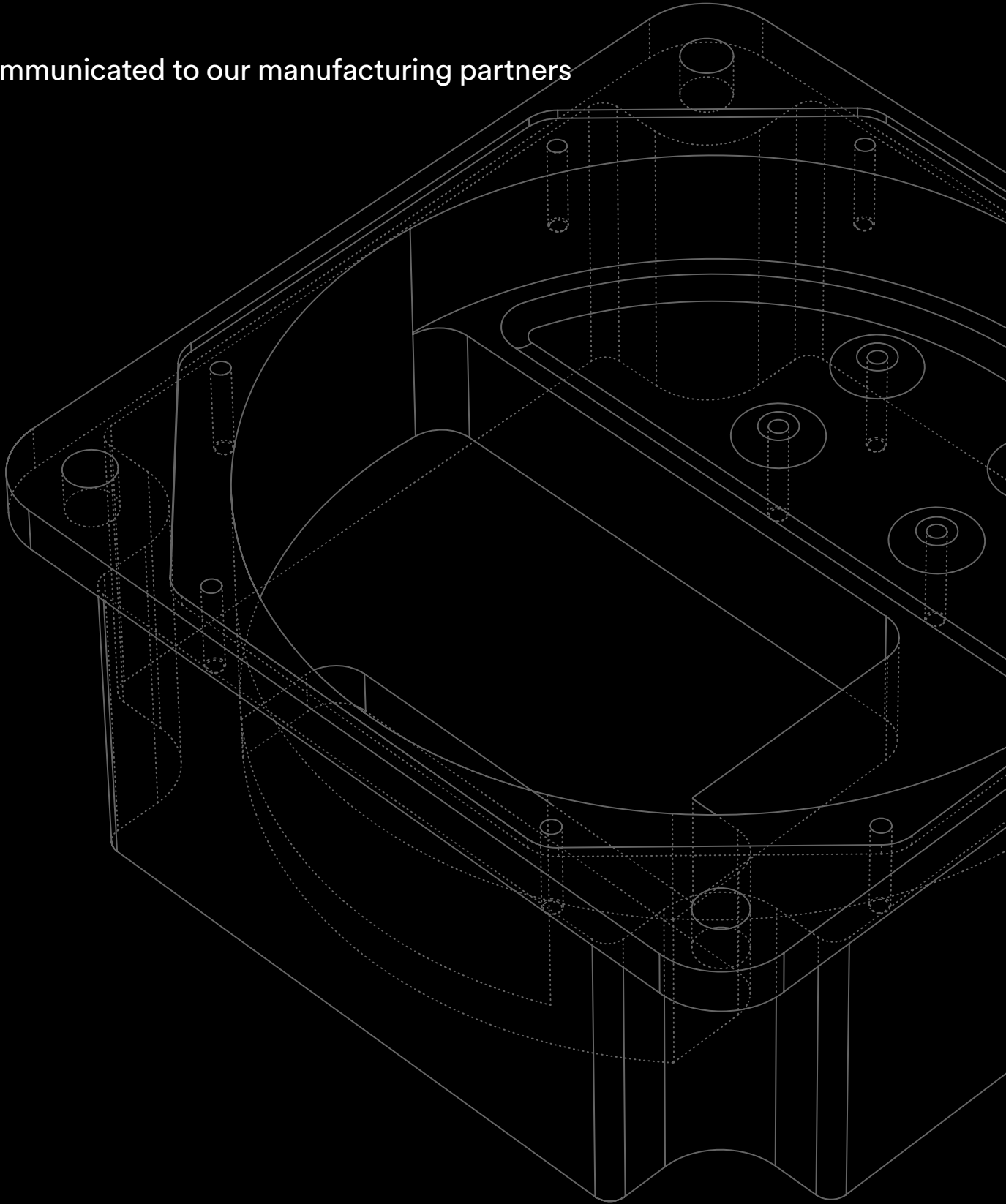


CNC manufacturing standards

v 2.4

- as communicated to our manufacturing partners



CNC manufacturing standards

Hubs offers you the possibility to use our Sample Verification Program (SVP) for orders that include a minimum individual part quantity of 50 units or \$4,000 USD order value. The SVP allows you to receive 2 sets of pre-production samples for in house testing prior to kicking off full-scale production.

Part size / Dimension	Tolerance	Angularity
< 200 mm (12")	± 0.125 mm (± 0.005")	± 0.5°
< 600 mm (24")	± 0.250 mm (± 0.010")	± 1.0°
< 900 mm (36")	± 0.400 mm (± 1/64")	± 1°
< 1500 mm (60")	± 0.8 mm (± 1/32")	± 1°
> 1500 mm (60")	± 1.6 mm (± 1/16")	± 1°

Standard order surface finish shall be referred to as As Machined and requires a ~125 RA μin (3.2 RA μm) finish. Minor tool marks visible on the part are acceptable. All sharp edges and burrs will be removed. If any form of threads (internal or external), any non-standard tolerances or any non-standard surface finish are required, these must be clearly indicated in a technical drawing.

6.2.1 Threads and tolerance specifications

The purchase order will indicate whether threads or tolerances are included in an order. The Manufacturing Partner must receive a technical drawing that clearly defines the specifications for these features. Threads and tolerances must ONLY be included on a part when a technical drawing has been provided.

By accepting an order, the Manufacturing Partner indicates that they have reviewed all technical drawings and have acknowledged the presence of threads or tolerances. Hubs is not responsible for informing the Manufacturing Partner that threads or tolerances are present.

Threads

All threads shall be cut straight and cleaned with any chips removed. All threads must be checked to confirm functionality.

Tolerances

Should tolerances tighter than those shown in Table 5.1 be required for an order will be indicated on the Purchase should be agreed upon before confirmation of the order. If a Manufacturing Partner is unable to achieve the tolerance specifications as presented on the technical drawing/s coinciding with an order, then they MUST reject the order.

6.2.2 Surface finishes

Hubs offers customers a number of surface finish options. Manufacturing Partners must NOT apply any surface finishes (including but not limited to sanding or grinding) without confirmation from Hubs in the Purchase Order to do so. This does not include the removal of sharp edges or burrs. When surface finishes are required, threaded or tolerance areas must be masked so that the finish does not affect the function of the part.

For surface finishes other than As Machined the following quality standards must be met:

Bead blasting

A matte finish with a light texture and consistent surface. Bead blasting should only be used when it does not damage part geometry or features.

Anodized

An anodized Type II surface finish as per ISO 7583:2013. The surface must be smooth and consistent with no marks or scratches. Hubs will provide the Manufacturing Partner with a Pantone or RAL color unless the finish is black or clear.

Powder coating

The surface must be smooth and consistent with no marks or scratches. Hubs will provide the Manufacturing Partner with a Pantone or RAL color unless the finish is black.

HUBS

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