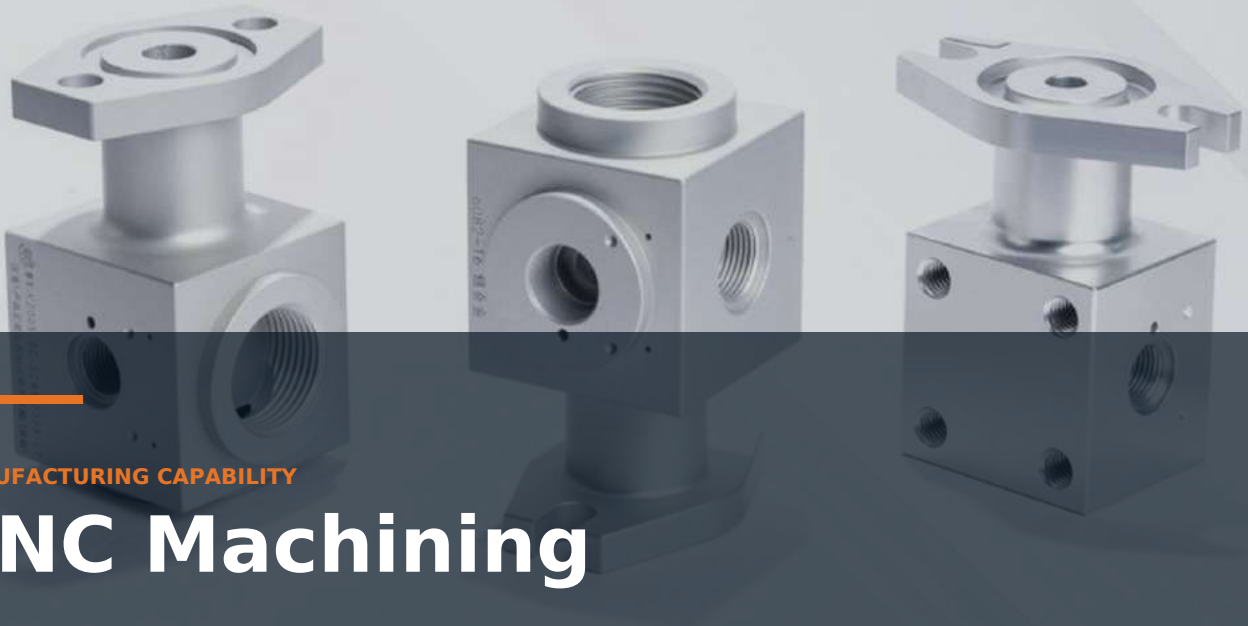


aluminum cnc machining parts



MANUFACTURING CAPABILITY

CNC Machining

Precision CNC machining for custom OEM components from bar, plate, castings and forged blanks

WHAT THIS PDF COVERS

3 / 4 / 5-axis machining

CNC turning and milling

Casting / forging blank machining

Dimensional inspection

01 / PROCESS FIT

When CNC machining is the right route

CNC machining is especially useful when the finished part depends on critical interfaces, controlled datums, accurate bores or repeatable geometry.

PROCESS FIT

Machining strategy should follow functional datums and critical interfaces...

- 3-axis, 4-axis and 5-axis machining
- CNC turning and milling
- Critical bores, faces, threads and datums

- Machining after casting or forging

01**Multi-Axis Access**

Reduce setups and access complex faces when geometry requires it.

02**Turning Capability**

Shafts, sleeves, flanges and rotational components.

03**Complex Features**

Bores, pockets, slots, threads, sealing faces and datums.

04**Integrated Route**

Machine cast or forged blanks when near-net shape is more efficient.

BUYER DECISION POINTS

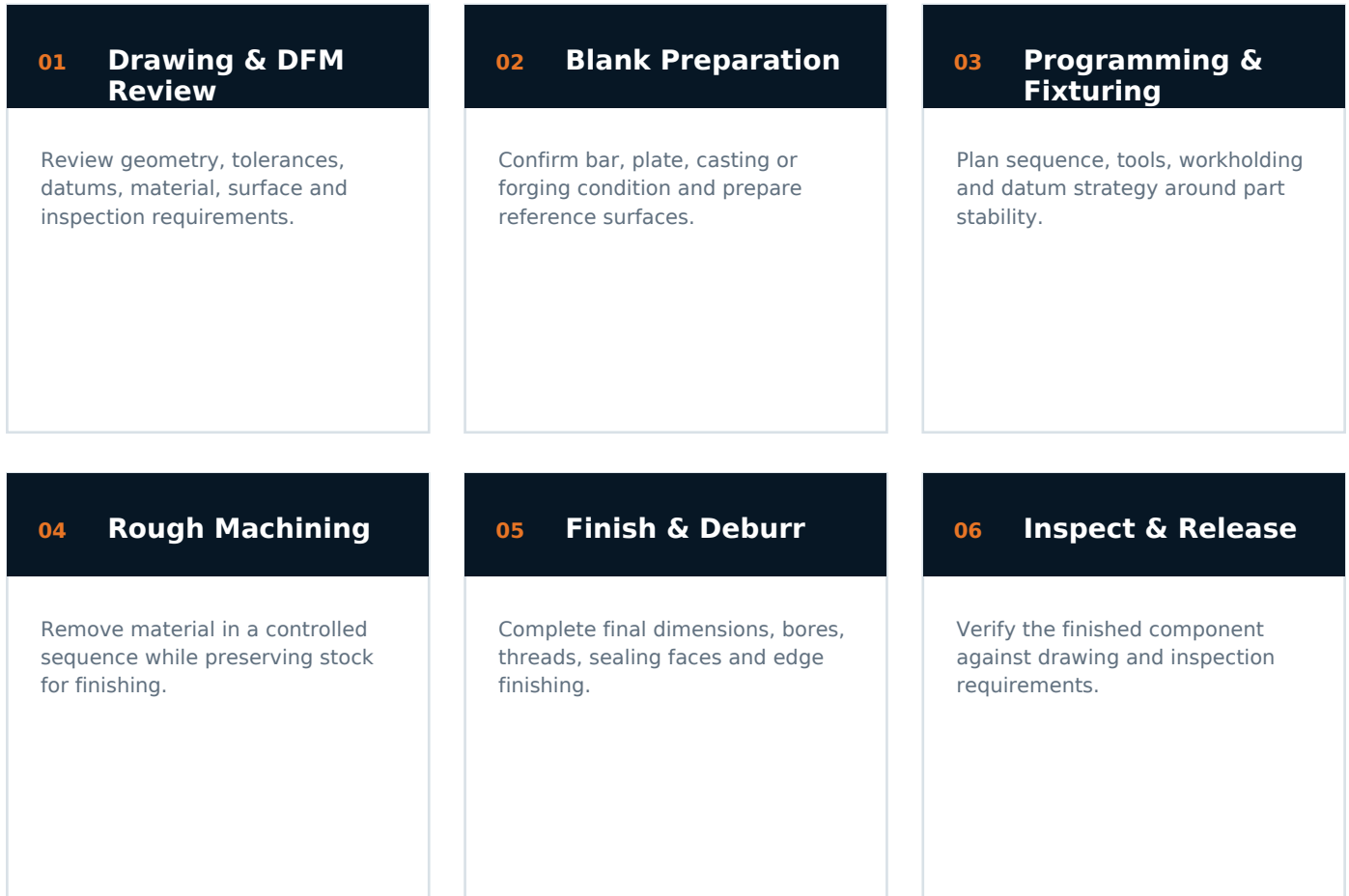
What should be clear before process selection

- Functional datums and assembly interfaces
- Incoming blank condition and machining allowance
- Critical tolerances and surface finish requirements
- Material grade and heat treatment
- Prototype, sample or repeat production quantity

02 / PROCESS FLOW

From drawing review to final inspection

A controlled process connects drawing, blank condition, machining sequence, critical datums and final verification.

**BEFORE WE START**

Drawing review connects the process to the finished part.

Identify the truly functional dimensions first. This helps control cost, fixtures, tooling and inspection without over-tolerancing non-critical features.

03 / MATERIALS & ENGINEERING

Materials commonly machined for OEM components

Material selection should follow strength, corrosion, temperature, wear, weight and service requirements.

Stainless Steels

Corrosion-resistant pump, valve and industrial components.

Carbon Steels

General mechanical parts, structural components and housings.

Alloy Steels

Higher strength, wear or heat-treated mechanical parts.

Aluminum Alloys

Lightweight housings, brackets, covers and precision parts.

Copper Alloys

Brass, bronze and selected fluid / wear applications.

Specified Materials

Customer-specified grades and supplied blanks can be reviewed.

ENGINEERING REVIEW

What should be defined before machining starts

Requirement	What We Review	Manufacturing Impact
Datums	How the part locates, assembles and is inspected	Drives fixturing and control of critical relationships.
Allowance	Blank stock and cleanup required on critical surfaces	Balances reliable cleanup against machining time.
Tolerance	Critical dimensions and GD&T	Determines tools, fixtures, sequence and inspection.
Surface	Sealing, bearing, wear or appearance requirements	Defines finishing operations and roughness verification.
Quantity	Prototype, sample, low-volume or repeat production	Influences setup, tooling and production strategy.

04 / REPRESENTATIVE COMPONENTS

Representative CNC machined component geometry

CNC machining supports shafts, housings, manifolds, rings, valve parts and complex multi-face components.



01

Cubic housing

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.



02

Precision shaft / tube

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.



03

Rotor / valve insert

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.



04

Precision valve ball

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.



05

Hydraulic manifold block

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.



06

Pulley / splined component

Representative geometry. Final manufacturing route is confirmed from drawing, alloy and quantity.

INTEGRATED MANUFACTURING

CNC machining can start from bar or plate, but many OEM parts are more economical when critical features are machined after casting or forging.

05 / QUALITY CONTROL

Inspection is integrated into the manufacturing route

Drawing review, datum control, in-process checks and final verification work together to keep critical features under control.



QUALITY CHECKPOINTS

01 Drawing Review

Identify critical dimensions, GD&T, materials and special requirements.

02 In-Process Control

Check key features before the next setup or finishing operation.

03 Dimensional Verification

Select measuring equipment according to geometry and tolerance.

INSPECTION & DOCUMENTATION

Inspection is part of the machining plan, not a final step

- CMM / dimensional inspection for critical geometry
- Surface roughness measurement where specified
- Material and hardness verification when required
- Thread, bore, flange and mating-interface checks
- Project-specific reports and traceability

06 / PROJECT PROOF

AL6082 4-Axis Precision CNC Machined Components

AL6082 aluminum components produced using 4-axis precision CNC machining for complex geometries and multiple machined interfaces.



NEXT STEP

Send your drawing for manufacturing review

Send your drawing, CAD model, material, quantity and critical requirements. We can also review casting or forging when a near-net-shape blank may be more suitable.

01 2D drawing or 3D model

02 Material grade / alloy

03 Estimated quantity / annual demand

04 Critical dimensions and tolerances

05 Surface, heat treatment or coating requirements

06 Inspection / documentation requirements

DOWNLOAD + REVIEW + RFQ

Use this capability PDF together with your drawing when discussing a new project.

www.thcastings.com