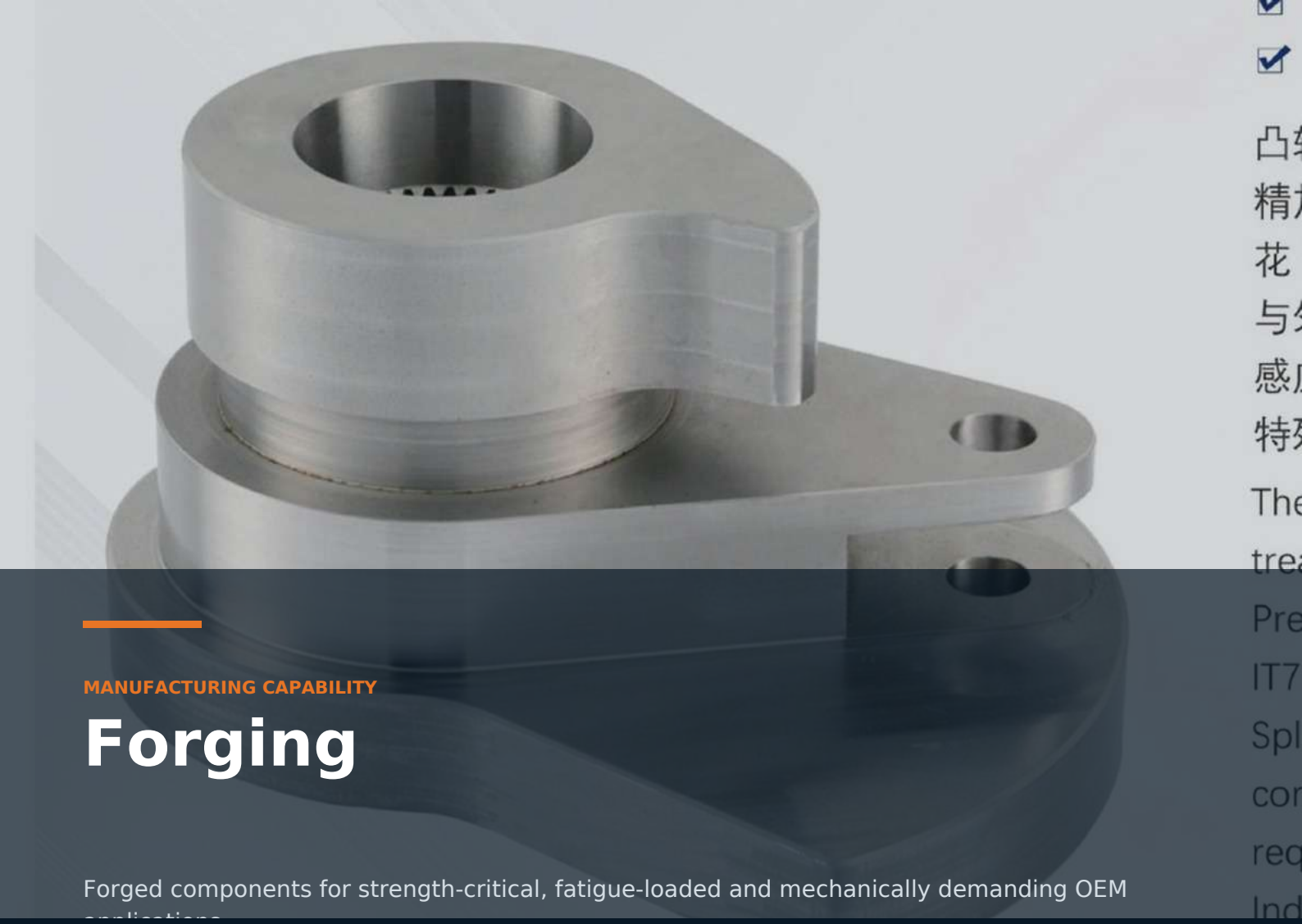

MANUFACTURING CAPABILITY

Forging

Forged components for strength-critical, fatigue-loaded and mechanically demanding OEM applications

WHAT THIS PDF COVERS

Strength-critical components

Controlled grain flow

Heat treatment + CNC

NDT and hardness verification

01 / PROCESS FIT

When forging is worth considering

Forging is commonly chosen when mechanical loading, fatigue performance, impact resistance or material integrity are important to the finished component.

PROCESS FIT

A strong option for load-bearing components where formed material flow...

- Load-bearing mechanical parts
- Repeated or impact loading
- Strength-critical geometry
- Forging plus CNC finished parts

01

Mechanical Strength

Suitable for demanding load-bearing components.

02

Controlled Grain Flow

Material flow can follow forged geometry when properly designed.

03

Fatigue Resistance

Appropriate forging and heat treatment support repeated loading.

04

Machined Finish

Critical bores, threads and interfaces can be CNC machined after forging.

BUYER DECISION POINTS

What should be clear before process selection

- Load direction and service conditions
- Material grade and heat-treatment target
- Parting line, draft and forged geometry
- Machining allowance and functional datums
- Annual quantity and tooling economics

02 / PROCESS FLOW

From engineering review to finished forged part

A controlled route connects forging design, material preparation, heat treatment, machining and final inspection.

01 Engineering Review

Review geometry, parting, draft, material flow, machining allowance and critical requirements.

02 Billet Preparation

Prepare specified stock size and verify material before forming.

03 Heating & Preform

Control heating and preforming steps around the selected alloy.

04 Die Forging

Form the component under controlled force with the approved die.

05 Trim & Heat Treat

Remove flash and complete specified heat treatment and cleaning.

06 Machine & Inspect

Finish critical features by CNC and verify the completed part.

BEFORE WE START

Drawing review connects the process to the finished part.

Confirm load-critical areas, material grade, heat treatment, machining allowance and inspection expectations before tooling design.

03 / MATERIALS & ENGINEERING

Material options for forged components

Material should be selected around strength, toughness, corrosion, temperature, wear and final service conditions.

Carbon Steels

General mechanical and structural forged components.

Alloy Steels

Higher strength, toughness, wear or heat-treated properties.

Stainless Steels

Corrosion resistance combined with mechanical performance.

Aluminum Alloys

Lightweight forged components with useful strength-to-weight ratio.

Copper Alloys

Selected electrical, thermal, corrosion or mechanical requirements.

Specified Grades

Material standards and heat treatment reviewed from the drawing.

ENGINEERING REVIEW

What we review before die and process design

Requirement	What We Review	Manufacturing Impact
Loading	Force direction, fatigue, impact and service conditions	Guides geometry, grain flow and heat-treatment decisions.
Material	Grade, properties and heat-treatment requirements	Defines billet, heating and post-forging route.
Geometry	Parting, draft, fillets and material distribution	Influences die design and forged material flow.
Allowance	Critical datums, bores and machined interfaces	Defines stock for CNC finishing and cleanup.
Volume	Development, repeat demand and annual quantity	Influences tooling and production planning.

04 / REPRESENTATIVE COMPONENTS

Representative forged component geometry

Load-bearing arms, shafts, hooks and linkage components are common forging candidates.

01

Rocker / control lever

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

02

Linkage lever arm

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

03

Forged hook / latch arm

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

04

Heavy control arm

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

05

Automotive rocker arm

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

06

Splined transmission shaft

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

INTEGRATED MANUFACTURING

Forging can be combined with quenching and tempering, induction hardening, CNC machining and non-destructive testing when required by the drawing.

05 / QUALITY CONTROL

Inspection is integrated into the manufacturing route

Quality planning connects material, forged geometry, heat treatment, machined features and any required NDT.

QUALITY CHECKPOINTS

01 Material Review

Confirm grade, heat-treatment target and any certificate requirements.

02 Forging Control

Check formed geometry, flash trimming and visible condition.

03 Machining Verification

Inspect bores, splines, faces and critical relationships.

INSPECTION & DOCUMENTATION

The inspection plan should follow the part risk

- Material and forged-blank verification
- Dimensional checks after machining
- Hardness verification after heat treatment
- Spline and angular relationship inspection where applicable
- 100% NDT when specified by the project

06 / PROJECT PROOF

42CrMo Forged & Machined Cam

Forging, rough machining, quenching and tempering, precision machining, involute spline control and high-frequency induction hardening.

NEXT STEP

Send your drawing for manufacturing review

Send the drawing, material grade, annual quantity and technical requirements so forging, heat treatment, machining and inspection can be reviewed together.

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