



Open and closed die forgings for the Aerospace and Defence Industries.



Bespoke customer pattern forgings from 5 grammes to 5 tonnes.



Independent Forgings and Alloys, Victoria Forge, Livesey Street, Sheffield, S6 2BL, United Kingdom.

About IFA.

IFA was created in 2001 when the open die forge site owned by Doncasters Group was privately purchased by our current owners. In November 2019, IFA completed the acquisition of the adjoining precision forge from Doncasters Group and the two sites rejoined under the IFA banner. This multi-million USD investment in closed-die precision forgings creates a unique 680,000 ft² fully integrated single site manufacturer of semi-finished high integrity components produced by both open-die and closed-die technologies, through press, hammer, seamless ring rolling, GFM radial forging and now closed-die forging. The investment will also create land to allow the company to physically expand and grow its business even further. The expanded company now has 212 employees and a revenue of USD 40M PA.



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How it started – 2001.

One revenue earning heavy
press forge and thirty pieces
of key operating plant.



Now.



The only single-site
forge in the world with:

OPEN-DIE

Radial forging
Press forging
Hammer forging
Ring rolling

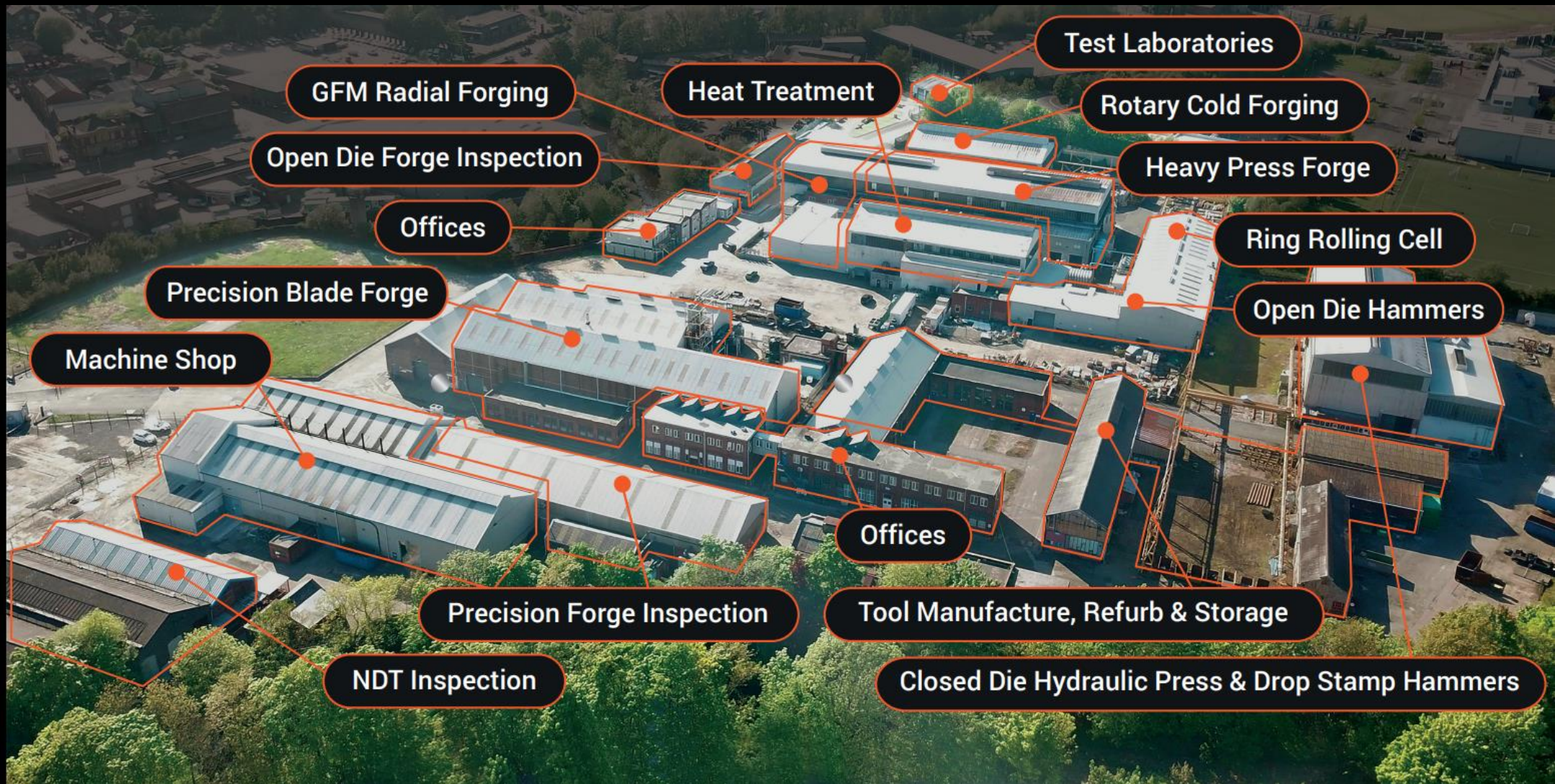
PRECISION CLOSED-DIE

Extrusion forging
Drop stamping
Blade forging

ROTARY COLD FORGING

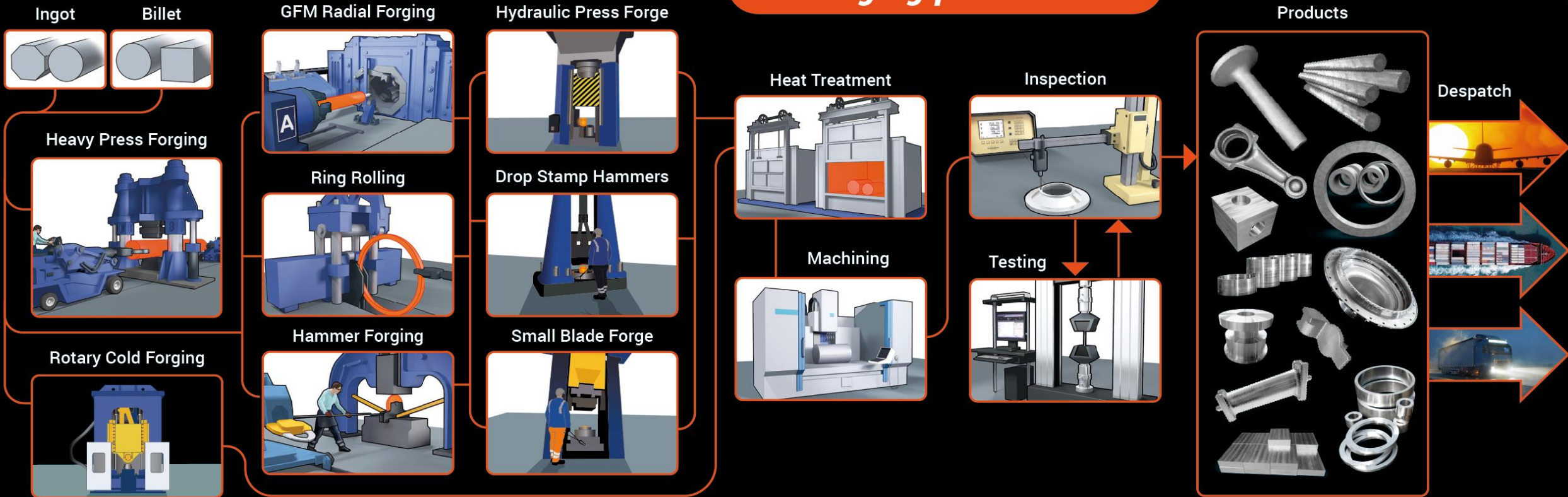
MACHINING

Fully tested &
released machined
products



A fully integrated forging service

Our forging process flow

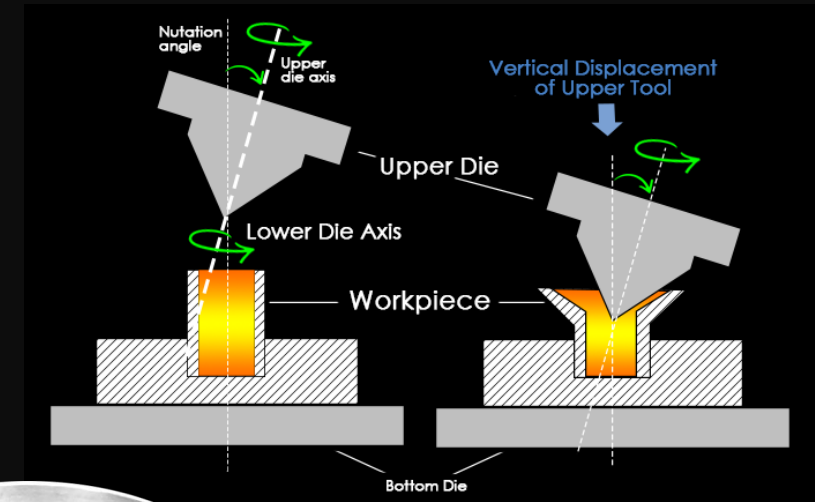


.....all on a single site.



Multi-Axis Rotary Cold Forging.

- Rotary cold forging is a cost-effective way to produce precision parts to close tolerances, while saving significant material costs and reducing energy usage.
- It is designed to produce parts with dimensional accuracies and surface finish qualities that will minimize or eliminate the need for additional machining operations.
- Typical components for rotary cold forge operations are round or cylindrical hollow parts in nickel-based alloys and titanium that require exacting material property requirements and have thin wall or complex geometries.
- The economic & technological advantages of rotary cold forging include greater near-net-shape dimensional accuracy, excellent forged material surface quality, optimised grain structure, no pre-heating of materials and reduced lead times.
- The process involves working material between two synchronized rotary dies which operate in programmable angles between 0-45 degrees. This produces compression in a concentrated area and provides a more efficient method for metal deformation, producing greater dimensional accuracy and superior mechanical & structure properties within the finished section.
- Sizes from 50mm dia to 500mm dia, max length 500mm depending on section size and geometry.



Closed-die: Small Blades section

700 Ton Maxipress

300 Ton Hydraulic Press

2000 Ton Crank Press

900 Ton Upsetter

1600 Ton Upsetter

1000 Ton Screw Press

1000 Ton Screw Press

1250 Ton Screw Press

1600 Ton Screw Press

Products: Single and double ended compressor blades, vanes and turbines.

Small rings and complex shapes

Sizes: 25-300 mm length, 5 – 5000 grams



Closed-die: Hydraulic Press Forge.

1750 Tonne Press Forge.

Products: Housings, casings, liners,
closed and open tubes, spindles, shafts.

Sizes: 150-1000 mm length, 50-375 mm
diameter, 2-250 kilos
(dependent upon material and complexity)



Closed-die: Gravity Drop Stamps

1.5 Tonne Closed-Die Hammer

2.5 Tonne Closed-Die Hammer

4 Tonne Closed-Die Hammer

Products: Bearings, Gears, shafts, actuators,
 housings, valves.

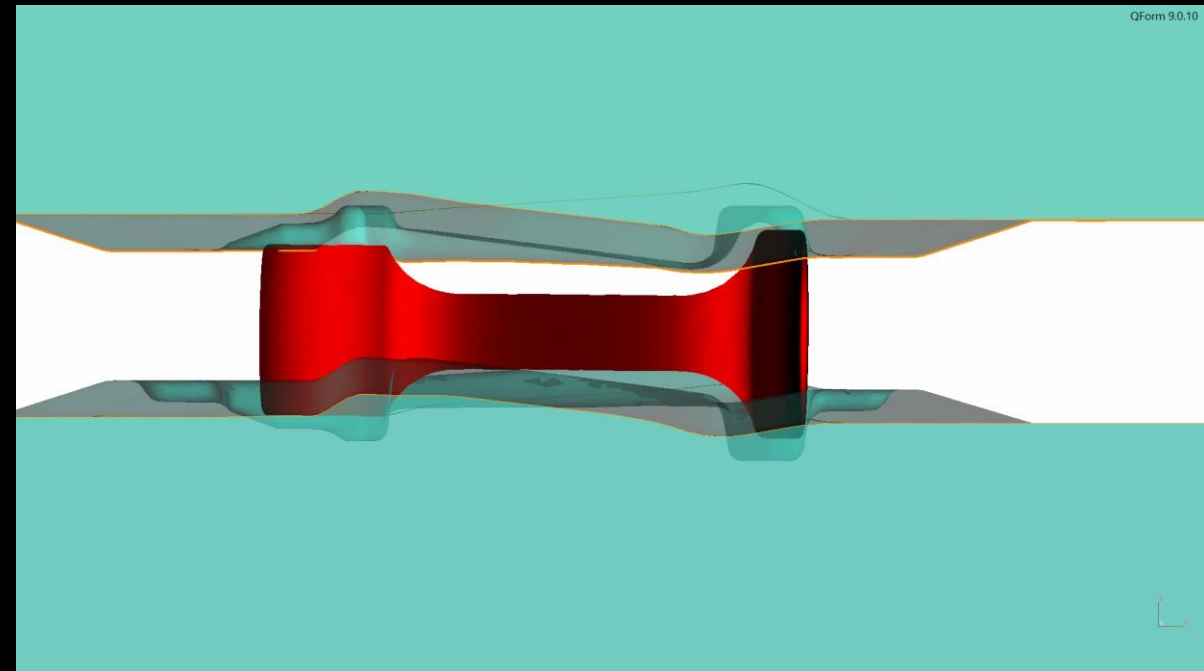
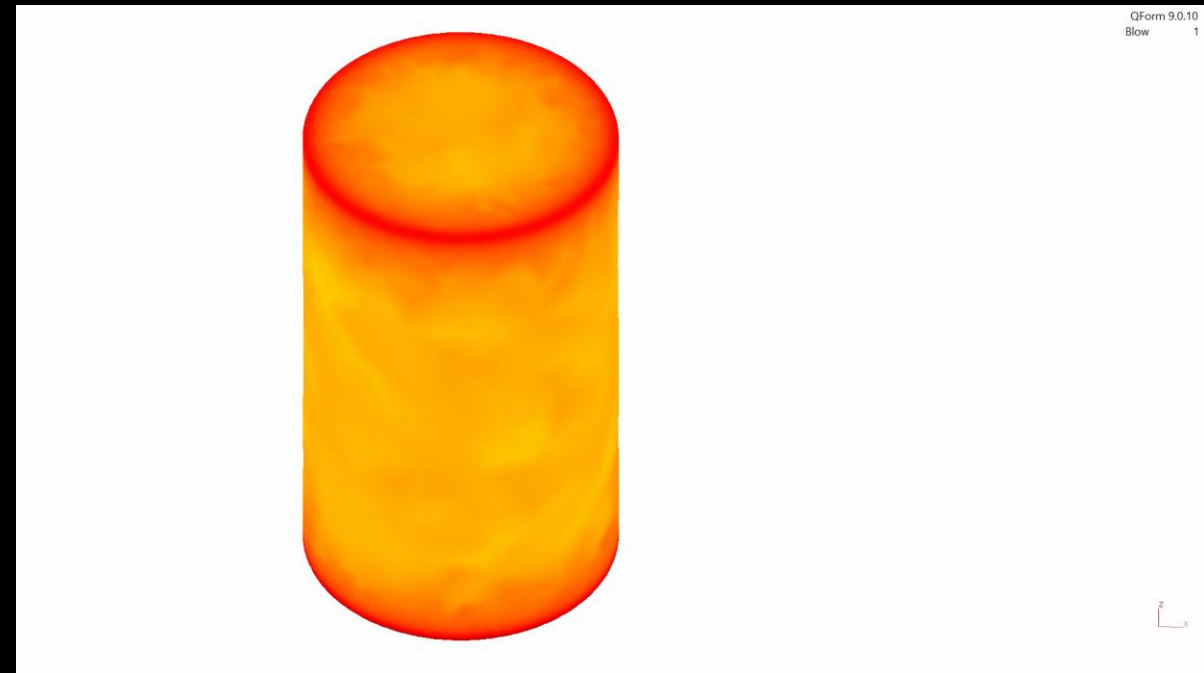
Sizes: 25-300 mm deep, 100-400 mm diameter,
 0.25-75 kilos
 (dependent upon material and complexity)



Forging Simulation.

We use forging simulation software to create new parts as 3D models in order to plan and refine the forging operation, before any required expense for tooling or material required to produce test forgings.

- Calculation and prediction of material flow during forging.
- Prediction of microstructure quality and estimation of likelihood of occurrence of surface and inner defects.
- Finding optimal shapes for forging tools.
- Finding optimal forging regimes
- Reduces wasted material.
- Increases durability of tooling.
- Ensuring the forgings operational suitability.
- Problem highlighter and solver.



Open die: Seamless Rolled Rings

With our horizontal and vertical ring rolling capacity we can produce rings up to 2500mm diameter, 720 mm deep & 2500kg weight.

Our 40T & 300T mills are fed by gas fired furnaces, ring handling manipulators, a 1000T hydraulic press, hammers and ring expanders.

Standard shifts are capable of producing 17,250 close tolerance rings and cylinders per year and capacity is always available as we can increase the number of shifts.



Open die: GFM SX26 radial forge

GFM radial forging of custom long products to bespoke sizes in round, square, rectangular, hexagonal, multi-section shafts. Minimal material allowance required to protect final dimensions of finished parts.

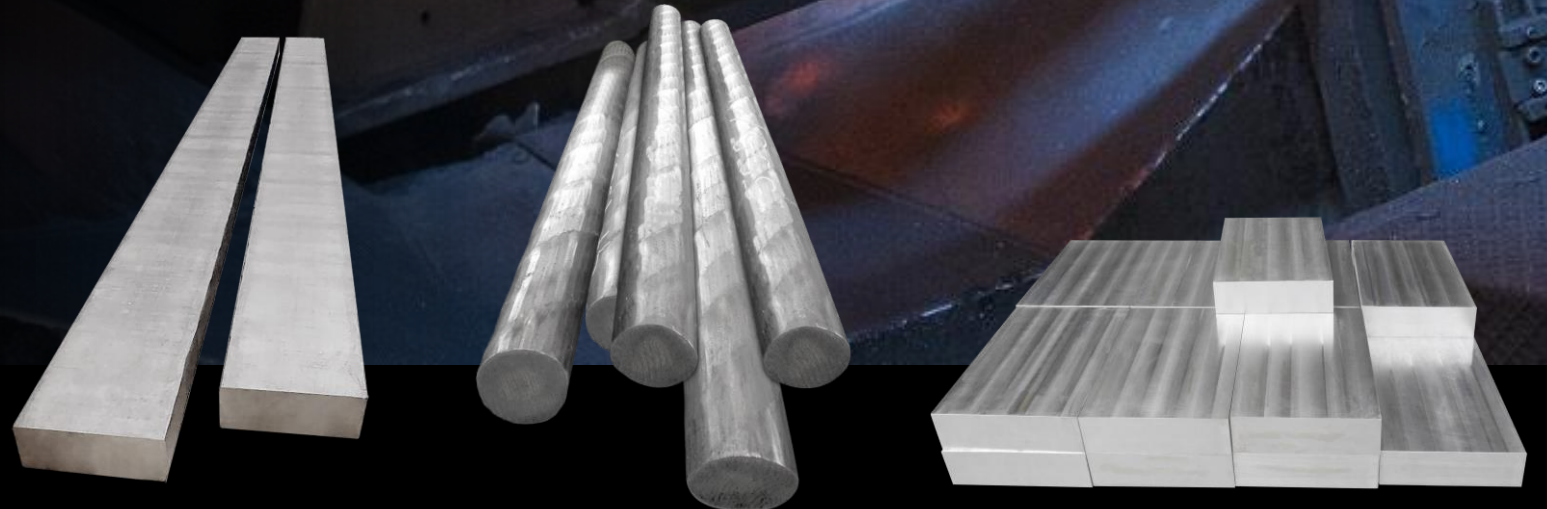
Section	Min (MM)	Max (MM)
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Rounds	48	250
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Squares	50	170
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Flats (W)	50	195
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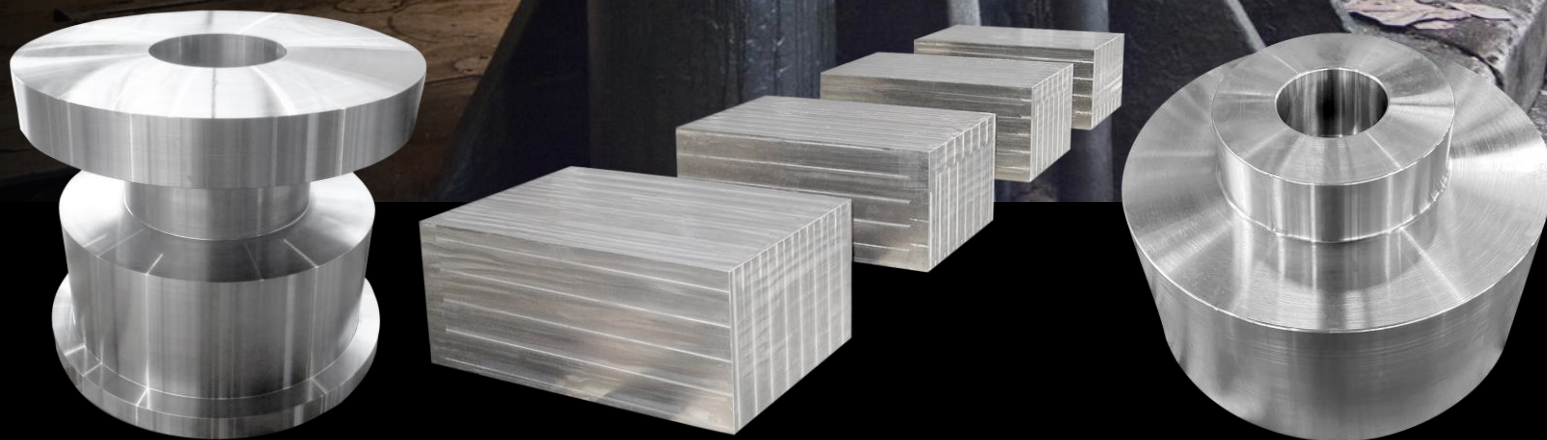
Flats (T)	20	
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Open die: Press Forging

Our 1500 Ton fast acting draw-down hydraulic press is fed by mobile manipulators for rapid transfer of pieces from 10 available gas furnaces which provides for a very high level of flexibility for production campaigns.

Maximum piece weights are: 10 Tons – Ingots, bars, shafts up to 310mm Diam. 8 Tons – Blocks, blanks, punched blanks. 6 Tons – Rings, tool forgings, boss blanks up to 2100mm Diam.



Open die: Hammer Forging

IFA operate 1 & 2T forging hammers which provide for a high level of flexibility to produce:

Bars – Rings – Blanks –
Boss Blanks – Planks –
Squares – Bespoke NNS.

Annual capacity of over 30,000 forgings in piece weights from 5 kg up to 150kg.



Inventory.

High performance alloys based on our strategy and customer needs are sourced as forging ingot and billet stock from approved mills. This material is then processed through our open and closed die hot working units against customer requirements.

Titanium	Nickel Alloys		Stainless Steel		Steel	Aluminium
6-2-4-2	625	K500	253MA	416	4340	7075
6-2-4-6	718	400	316L	310	8630	7049
6AL4V	725	617	321	18-18	General low alloy	7050
Ti230	80A	WASP	410	M153	1020	L77
TA550	825	188	FV520B	FV448	1040	L168
Gr 23 6AL4V ELI	R41	625 PLUS	M152	M250	508M	
Gr 1	HX	909	A286	M300	4330	
Gr 2	25	PE11	17-4PH	M350	53	
Gr 3	75	105	15-5PH	XM19	440C	
Gr 4	230	HS	13-8MO	X20Cr13	B16	
Gr 7	C263	800	347	450	CBS50NIL	
Gr 9	X750	800HT	304L	F51	HYKRO	
Gr 12	600	901	316	18-18-2	4145	



Quality Heat Treatment.

Accredited to AMS2750 and ISO10423, our dedicated Heat treatment facility includes 8 gas-fired furnaces fed by 2 rail bound charging machines, with water and oil quench tanks.

Full temperature control and monitoring features on all units.

Temperature range from 420-1230°C.

Charges of up to 6 tonnes quenched, and 10 tonnes air/furnace cooled, long bars up to 22' / 6.7m can be annealed and warm straightened.

Several smaller furnaces catering for small loads and low temperature treatment.

Annealing

Normalising

Hardening / Tempering

Stress Relieving

Solution Treatment

Ageing and Precipitation Treatments



Machining.

A modern 10,000 ft² facility houses IFA's machining centre, where forged parts are machined to near net shape or according to customer requirement. Finishes range from proof machining to inspection profiles or precision close tolerance machining. IFA have invested in a suite of 5 axis CNC lathes, vertical borers, mills and long bar lathes able to machine parts up to 2200mm diameter, 3300mm length and 750mm height.



Metallurgical Test Laboratory.

IFA has it's own modern purpose built test laboratory and it's team of skilled technicians and operators test material we produce to ensure strict compliance to customer requirements.

Mechanical:

Room Temperature Tensile
Elevated Tensile (300 – 800°C)
Charpy Impact (-80 – 200 °C)
Brinell Hardness (HBW 10/3000)
Rockwell Hardness (HRC & HRB)
Vickers Hardness (HV10 & HV30)

Metallurgical:

Microstructure
Macrostructure
Grain Size
Inclusion Count/Microcleanness
Alpha Case Depth Measurement
Volume Fraction

Specimen Heat Treatment (350 – 1150°C)





NDT inspection.

Operator qualified to SNT-TC-1A & PCN Level III

Contact ultrasonic examination.

Positive Material Identification (PMI) testing.

Dye Penetrant Inspection (DPI) of machined products.

Magnetic Particle Inspection (MPI) of machined products.

CMM Dimensional on components up to 600mm diameter.

Experienced Visual examination of finished products.

Component marking.



Customers

Aerospace
Defence.
Energy and
Power Gen.

- Airbus
- Allegheny Technologies
- Babcock
- BAE Systems Air
- BAE Systems Submarines
- Gardner Aerospace
- GE Avio
- GE Power
- GKN Aerospace
- Honeywell Aerospace
- ITP
- Leonardo
- Liberty
- Meggitt PLC
- MOD Q1(N)
- MTU
- PCC
- Pratt & Whitney (LCS)
- Rolls Royce PLC
- Rolls Royce Deutschland
- Rolls-Royce Nuclear Submarines
- Safran
- Siemens
- Senior
- TechnipFMC
- VSMP0
- Weatherford





Quality.

- LR AS9100 Rev D/ISO 9001:2015 Quality
- LR ISO 14001:2015 Environment
- LR ISO 45001:2018 Safety
- Lloyd's Register of Shipping
- UKAS – ISO/IEC 17025:2017 Testing and Calibration Laboratories.
- NADCAP - Metallic Materials Manufacturing (Merit)
- NADCAP - Materials Testing Laboratory
- NADCAP – Non Destructive Testing
- NADCAP – Heat Treatment
- NADCAP – Chemical Processing



Industry Sectors.

Energy &
Powergen
25%

Aerospace
49%

Defence
26%



Proposition.

- Only forge in the world to have open die GFM, Presses, Hammers, Ring Rolling Mills, closed die Drop Stamp Hammers, Extrusion Press and Precision Blade forging and Multi-Axis Rotary Cold Forming technology on a single site.
- Legacy / Spares ... New Product Introduction ... or existing Serial production
- Flat management structure able to make decisions fast.
- Easily managed supplier, contact is easy, all production on one site.
- Prompt reply to all enquiries and other requests.
- Flexibility of supply – Sizes/Lengths/Quantities/Destinations.
- Highly skilled, technically experienced partner for forging a wide range of alloys.
- Problem solver – working closely with customers to optimize supply.
- Proven record of OTD and PPM metrics.
- Robust quality assurance system with approvals ensuring high standards of product and service.
- Culture of continuous improvement of our people, assets, skills and processes.
- Investments in place to support our business growth plans.



THANK YOU.