

Independent Forgings & from the deepest ocean



2400mm o/d ring in stainless steel for the power industry.

Independent Forgings & Alloys Ltd (IFA) is a specialist open die forging and ring manufacturer, producing forgings of up to eight tons in a wide range of materials. The company was founded in 2001 with a unique vision to be a complete forging service centre. A combination of experience, knowledge and on-going investments has seen IFA reduce manufacturing lead times down to an industry leading 6 weeks. Their quest for further improvement in both forged products and customer service continues. Stainless Steel World spoke to CEO Andrew McGuinness about the company's focus on excellence and the advanced manufacturing solutions it offers its customers... wherever they may be.

By Joanne McIntyre

"We provide 21st century advanced manufacturing solutions, and are literally involved in projects from the deepest oceans to outer space," begins Mr. McGuinness. "Beneath the seabed, IFA supplies forged drive shafts for directional drilling tools; our valve bodies, tubing hangers, seals and gaskets are deployed in deep waters off Brazil, and we supply key components to nuclear submarines and other defence vessels. All Formula One race cars have our titanium press-forgings as a key component of their drivetrain and our forge produces various aerospace engine and airframe components for helicopters and civil aircraft - and we even forge titanium

Alloys Ltd ... to outer space



half centuries of forging history behind it - operated a single forging unit. Over GBP 10 million has been invested in the last 12 years culminating in five modern individual forge units covering the full range of products – ranging in weight from 1 to 8000 kg, with further investment planned over the next 3 years to support the company’s growth strategy. Forging facilities on site now include hammers, ring rolling mills (including the UK’s most powerful), heat treatment facilities, fast acting hydraulic presses, machining facilities and a range of supporting equipment. The GFM rotary forging machine – of which there are just two in the United Kingdom - is used to produce rounds and flat bars. The growth of the company over the years has also necessitated a significant investment to find the right, qualified staff, explains Mr. McGuinness. “Our team has grown from 30 to 135 people, and in the past 12 years an enormous amount of effort has gone into recruiting, training, and developing the team. Fortunately Sheffield has a long history of forging and a strong skilled workforce. Traditionally forging was a profession that was passed from father to son; however times have changed and a more pro-active approach is needed. Therefore we have developed our own forging apprenticeship program to train our staff, in cooperation with Sheffield College.”

Fast track supply

Independent Forgings & Alloys was founded as a forging service centre,

rings for communication satellites in outer space!”

“Our core products are seamless rolled and hammer forged rings, press forged rings, blocks for valve bodies and shafts, plus GFM forged round and flat bars for gate valves and turbine blading bar.

We work with all materials, ranging from nickel alloys to titanium, stainless steel and carbon alloys. While the main sectors we supply are oil & gas, power and aerospace applications, it’s fair to say we supply to almost any industry that demands high integrity forged parts.”

Advanced manufacturing solutions

When IFA opened the doors in 2001, the existing site - which has over two and a



GFM SX26 producing a flat bar in nickel alloy 718 for gate valves.

Independent Forgings and Alloys - Strategic Alloys

The flexibility of capabilities and forging experience is extensive. IFA carry strategic ingot and billet stock across the range of Nickel, Special Steels, Titanium and Cobalt alloys.

| Nickel Alloys | Alloy Steels |
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| Alloy 617, 625, 718, 725, X750, 825, 901, 909: Alloy 75, 80A, 90, 105: C-263, Alloy X, HX: Alloy 800H/HT: Alloy 400, K500: Waspaloy Rene 41 | HYKRO, F22, F65, LF2, 4130, 4145, 4340, 8630 |
| Stainless Steels | Titanium |
| 13-8Mo PH, 15-5 PH, 17-4 PH, A286, Maraging 250/300/350, XM19, Alloy218, Jethete M152, Stainless Grades 316L/321/347/410, Duplex F51, F55 | 6Al-4V Grade 5, 6Al-2Sn-4Zr-2Mo, 6Al-2Sn-4Zr-6Mo, Grades 1, 2, 3, 7 |
| Copper Alloys | Cobalt Alloys |
| Cu/Ni 90/10, 70/30: NES 833 / 835 | Alloy 188, Alloy 25 |

which is quite different from traditional forge houses, continues Mr. McGuinness. "We treat our customers as partners and work very closely with them to understand their actual requirements. Our goal was to reduce industry's standard lead times of 12 to 14 weeks to 6 to 8 weeks. Our heavy investment in the site's capability, combined with flexibility, adaptability and an understanding of how we could improve our lead-times has enabled us to achieve this. We have the capacity to rapidly increase production by over 15% when necessary and are now able to guarantee the fast track supply of as-forged and machined semi-finished components. When a part is needed urgently, for instance on an oil platform or deep-hole oil well, we can instantly react and get our forging to the customer before anyone else can."

The independent edge

"We deliberately chose to include the word 'independent' in our name,"



Nickel alloy 718 flat bars after forging.

explains Mr. McGuinness. "We felt it was important to highlight the fact that we are privately owned. This means that when it comes to sourcing raw materials we aren't influenced by large corporations. We can enter into long term agreements with any qualified, approved mills we choose. This also means that we are able to promote European manufacturing as a preference and only purchase our raw materials from within the Euro Zone wherever possible. We are great believers in practising what we preach. It's a pity that more companies don't follow suit and buy from European manufacturers instead of thinking that they will find qualified, competitive materials at low cost elsewhere."

IFA's strategy has always been to focus on high performance alloys, such as the nickel alloys, 625, 718, 725 etc. and titanium, and to develop expertise in the processing from the ingots to billet. "As an independent company we are focused on continually improving our yields to allow us to provide cost advantages to our clients. Today our conversion yields are over 94% for all the high performance alloys and well above the industry standard which gives us a competitive edge."

Key markets

IFA's customer base is worldwide and the company participates in industry trade shows in North and South America,

Europe, Middle East and Asia. The company targets the growing sectors within Aerospace, Energy – Oil and Gas and Power Generation (including Nuclear) and high-end Advanced Engineering where their chosen markets are driven by global demand. Both directly and indirectly, its products are used worldwide.

"Our speciality is supplying products for highly demanding applications, such as valve bodies for ultra-deep wells and the nuclear industry, airframe and engine components for the aircraft, helicopter and aerospace markets."

"Of course we are interested in expanding our customer base further; the Brazilian market is of interest to us and we're actively looking for partners in the US and Middle East. IFA takes a very analytical approach to the markets where we have an interest to determine how we can best serve the supply chain in each region," says Mr. McGuinness. "We're also constantly looking at further developing our process routes to maximise the performance of the alloys we forge. Our customers have increasingly demanding requirements with a strong focus on improved safety and functional performance from the alloys they use. For instance in the oil and gas sector we are seeing an increase of the use of both alloy 625 and alloy 725 due to increased technical demands from the industry."

Machining capabilities

1 100sqm machine shop
Comprehensive range of machine tools and 24/7 working offering quick turn round on all product, large batch quantities or single items.
3 axis CNC milling 2000mm x 1000mm x 700mm @ 5000kg
Vertical boring up to 2500dia x 900high @ 5000kg
CNC turning 800dia x 4000mm @ 5000kg
Manual turning 800dia x 4000mm @ 5000kg
Band sawing up to 600mm

Challenging projects

The company has been involved in many challenging projects, and was even involved in the development of

alloy 725 back in 2003. "At that time, we forged the largest section size ever produced – 1,500 kg - for a defence project," says Mr. McGuinness proudly. "It was still under patent at that time and we worked very closely with the mill." "One of the most challenging projects in which we've been involved was the forging of an alloy 690 ingot for a heat exchanger plate for the US nuclear industry. Our flexibility and willingness to support new projects meant that IFA had close involvement in the development of forged parts for both the Airbus A380 and Boeing 787 Dreamliner projects."

Successful completion of such demanding projects requires a great deal of close communication and cooperation with the client. "We treat our customers and suppliers as partners because at the end of the day we need to work well as a team. With this in mind we keep a strong focus on finding ways to improve material performance, reduce weight, and in particular minimizing machining waste. In fact machining waste is an important cost factor because it impacts both on lead time and material use. This is one area where our expertise can lead to significant cost savings for our customers as there is a tendency for designers to over specify. It's not uncommon for us to see surplus material allowance in excess of 15%. When that happens, our knowledge



Andy Mc Guinness CEO with his team of directors.

can help to advise the designers on how to avoid this, which is tremendously important in the oil & gas and aerospace industries where both weight and cost are critical factors."

Long history, bright future

IFA continues to build on a tradition of technical excellence, innovation and flexibility. The company is renowned for its expertise in open die forging and it's a process which the company continues to develop and further improve. The Sheffield site is one of the oldest forging sites in the world, with a history dating back to 1587. "Many of the

alloys which we use in today's industry were actually developed on this site and while today we use the very latest technologies and materials to achieve a superior result, the essential principles of the forging process remain the same," explains Mr. McGuinness. "We are very optimistic about the future due to positivity and confidence returning to the industry. Mill deliveries are now extending and will soon be at pre-recession lead times. IFA are in a strong position to support our customers through our ability to provide a diverse range of products and materials on short and scheduled deliveries."

Hire work/toll work specialists

Customers can take advantage of IFA's renowned forging expertise by sub-contracting the company to carry out hire work (toll forging). The IFA Service Centre performs the industry's fastest turn-round, high quality hire work/toll work, including forging, heat treatment, machining/cutting, NDT and inspection.



Alloy 690 ingot being upset forged for the Nuclear industry.

Facts & Figures

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| Name: | Independent Forgings & Alloys Ltd |
| Location: | Sheffield, England |
| Products: | Rings, bars (round/square/rectangular), discs, shafts, boss blanks, blocks, toll/conversion forging |
| Materials: | High temp/super alloys, titanium, stainless, carbon & alloy steels, zirconium, copper, aluminium |
| Key Markets: | Aerospace, oil & gas, nuclear, marine & defence, power generation/IGT |
| Employees: | 135 |
| Turnover 2013: | GBP20M |
| Quality Approvals: | AS9100 Rev C Quality Systems Aerospace, ISO9001:2008 Quality Systems, Nadcap Heat Treatment Aerospace, ISO 14001:2004 Environment, BSOHSAS18001:2007 Health and Safety |

