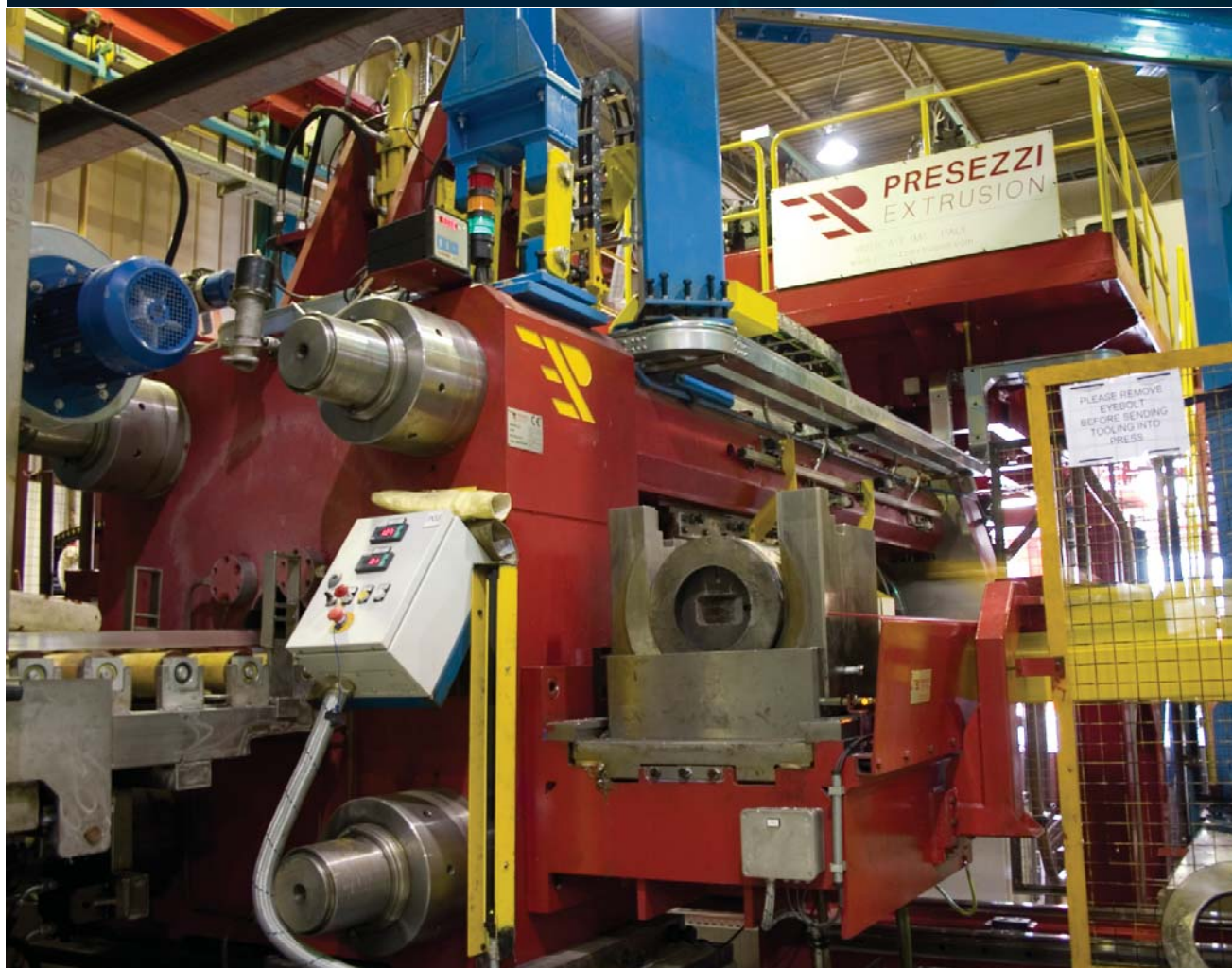


Aluminium Times

sapa:

Shaping the future



modern media communications Ltd

- Sapa Profiles UK invests in new 2000t extrusion press and line
- New press increases Sapa's ability to produce complex sections and higher quality
- New diemaking technology will speed response times
- Remelt and casthouse areas to undergo investment of £2.15 million
- Expansion of fabrication facilities and warehousing
- Investment in the development of new applications for aluminium profiles

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Company Profile

Sapa Tibshelf takes centre-stage in UK profile production

Feature

Sapa Profiles UK Limited continues to invest heavily in its manufacturing resources as they re-enforce their commitment to UK manufacture. Sapa are convinced that, even during the latest economic down-turn, that investment and modernisation are necessary in order to maintain a competitive market position and give their customers the confidence of long term local supply partner. Their latest major investment is the installation of a new 2,000 tonne extrusion line at its works in Tibshelf, Derbyshire. This article provides an insight into this £2 million development and several other investment initiatives.

The Sapa Group, part of the Norwegian Orkla organisation, continues to evolve. It was only in March, 2007, that the company entered into a joint venture with Alcoa to set up the world's largest soft-alloy extrusion business which resulted in a combined capacity approaching 900,000 tonnes per year. The group's key strategy of moving from an extrusion supplier to a solution provider is strongly reinforced by their investment in Technicians and Engineers to help customers in all stages of product development. In addition, the group has invested nearly €3.2 million in its new Innovation Centre, a development resource, based in Vetlanda, Sweden, accessible to both clients and Sapa companies worldwide.

Locally, in the UK, Sapa operates from two locations in Cheltenham and Tibshelf, Derbyshire. The Cheltenham plant is equipped with two presses, one employing 9-in billet, the other 8-in billet. The facility also includes an anodising surface finishing plant. This extrusion operation is mainly employed in the manufacture of high surface finish profiles in 6000 series alloys.

The Tibshelf factory also operates two presses — one processing 9-in dia billet, the other 7-in billet. In this case, the final product is largely destined for the general engineering and transport markets. The plant also houses the organisation's remelt/billet casting operation which re-enforces Sapa's commitment to the environment in scrap recycling. Together, the



Billets entering the gas-fired heater serving the Presezzi press

plants have a capacity of approximately 50,000 tonnes per year.

The restructuring and modernisation of Sapa's UK operation, which primarily supplies the United Kingdom and Ireland, places the organisation in a strong position to weather the current economic storm. The

Tibshelf and Cheltenham plants can be considered as a single entity, with the flexibility of running dies on more than one press which, in turn, gives confidence to customers that the company always has a flexible lead time. This is seen as key to providing a local supply service at the highest possible level.



The main entrance to the offices and works of Sapa UK at Tibshelf

New 2000 tonne press

The new 2000 tonne Prezezzi press, installed in August 2008, began producing profiles from 7-in dia billets at the end of the following month. The layout includes a double puller, and a flying saw designed to cut on the weld. The largely-automated stretcher and saw arrangement is overseen by one operator. The billets are pre-heated in a gas-fired furnace which, in its final stage, incorporates taper heating. The billets, as they emerge from the furnace, are hot-sawn to length and then transferred, by an overhead pick-and-place robot, to the press. Dies are preheated in one or other of three double and four single chest heaters supplied by Castool of Canada. A new normalising furnace is soon to be installed, bringing up the number in use to three.

The new press has brought immediate benefits, including greater flexibility, the ability to produce even more complex sections and improved quality.

Die making facilities

At the present time, the Tibshelf plant has largely conventional die maintenance facilities. However, the company is about to invest £0.25million in new die making technology which will bring a number of immediate benefits, including faster response times and the ability to modify dies in a very short time. The new facility will focus on making flat dies using Sapa's unique technology in die manufacture.

Once on-stream, Sapa expect to create a new benchmark for the speed of turnaround of new dies to the market.

Service Aluminium extrusion dies



Service Aluminium in Gloucester has supplied flat and hollow extrusion, dies up to 460 mm diameter to both SAPA plants in the UK for over 25 years. Service Aluminium are the only independent die manufacturer licensed to use the patented Auto-tool process, which enables complex sections with high tongue ratios to be produced as flat dies from pre-hardened blanks. This unique process provides maximum support to the die and the benefits of dies produced by this process are recognised by extrusion companies throughout the world. Continuous investment in new machines and software development, combined with many years experience, enables Service Aluminium to manufacture dies for the most complex sections with quick turn round times. The new factory extension has enabled the material flow within the plant to be optimised and also increased the space available for further investment in machinery, as well as a new design office.

Reader Reply No.77

Intoco supply tooling for new Prezezzi press



UK-based Intoco was commissioned by Sapa Profiles UK to design and manufacture the die tooling for the new Prezezzi extrusion press at Tibshelf. The prerequisite of the contract required that Intoco would fully accommodate the use of existing dies from other Sapa UK sites within the new press format and existing bolsters would be modified into inserts and incorporated into adapters. A complete survey of all the tooling throughout the UK group was undertaken to assess the best options for each die size and to give the broadest flexibility to achieve total die inter-changeability between sites. Close liaison with

the Sapa Die Technicians was necessary to assess tool stack dimensions, tooling combinations and extrusion stresses. The contract represented an example of the diverse products that Intoco supply to Sapa and other extruders worldwide which include main cylinders; sealing cylinders; columns; shuffle systems; cassettes; pressure pads; stems; containers and relines; fixed pads and shear blades.

Reader Reply No.78

Feature



Sapa die technology

Remelt facilities

The remelt facilities at Tibshelf are housed in a separate building detached from the main production bays. The final product, billet, is used by both Tibshelf and Cheltenham. The basic raw material, which includes all the arisings from both plants, is mill-finish scrap. The process technology employed now allows the remelting of powder-painted extrusion. The current plant includes a remelt reverberatory furnace, originally supplied by Tynock, with a capacity of 20 tonnes and a Mechatherm holding furnace of 15 tonnes capacity. The Tynock furnace is equipped with a pair of gas-fired 100/120 low NOx regenerative ceramic burners rated at 3,000 kW, installed by Dyson Hotwork, Limited.

The molten aluminium leaving the holding furnace is passed through a SNIF filter unit designed to remove oxygen, hydrogen and other deleterious elements. From here, the metal passes to a Wagstaff Airslip® casting table which allows for the production of 12 billets at a time, ranging in diameter from 7 to 9 in. The majority of the billet cast is 6082, although a smaller proportion of 6063, 6005 and 6061 are also produced. Also housed in the building are three 15-tonne-capacity homogenising furnaces, a cooler and a saw. Samples are taken from every melt for analysis on an ARL 34000 metal analyser.

The melting/casting shop is soon to undergo a major refit to allow it to produce 25,000 tonnes per year of billet up to 8-m long. This will enable Sapa Profiles UK to be more self-sufficient in its consumption of billet. As part of this programme, the 20 tonne melting furnace will be replaced by a 27 tonne version, and the 15 tonne holding unit will be exchanged for a 23 tonne furnace. The total cost of this expansion will be in the region of £ 2.15 million.



CNC capability

Product development and added value

Sapa are convinced that the future of the extrusion business is very dependant upon the development of new applications for the use of aluminium profiles. To this end, the company has increased its technical staff resources in order to provide potential users with all the necessary technical input to ensure the development of a cost effective solution. More than £0.5million is being invested in their new fabrication facilities at Cheltenham along with the addition of a new 1100m² warehouse. Sapa will also launch a new website this spring aimed specifically at designers in order to stimulate the potential of using aluminium extrusions in product applications.

Reader Reply No.81



A view from the new Presezzi press with the double puller and flying saw on the right and cooling tables forward and to the left

LSM provide Sapa with grain-refining and alloying solutions

LSM has been the main supplier of TiBAI™ grain refiner and ALTAB™ alloying additions to Sapa, UK, Tibshelf, for many years. LSM's close proximity to the Sapa plant has been invaluable over the years when rapid deliveries have been required. The grain refiner rod is still being fed by one of LSM's early rod feeders, built by Thompson and Hudson, Brighouse. The first rod-feeders were produced in the mid-seventies upon the implementation of rod feeding, as opposed to a waffle addition to the furnace. The grain-refiner rod is added at very small addition rates to reduce the cast grain size. This allows Sapa to cast much faster, thus increasing productivity. It also improves the mechanical properties of the alloys, which is helpful during extrusion. ALTAB™ is LSM's trademark for a concentrated additive based on 75 – 80% of element, the balance being flux or aluminium powder. These products provide a fast-acting, lower-cost alternative to binary master alloys when making additions to liquid aluminium.

LSM is part of the Advanced Metallurgical Group N.V. (AMG), a leading global speciality metals company (created out of the formerly private group Metallurg Inc. in the United States), offering highly engineered metallurgical products and vacuum furnace systems to a wide range of industries. .

Reader Reply No.79

Single-cell die ovens enhance production at Sapa UK

In light metal extrusion, most of the value added is generated in the instant that the alloy passes through the die. Until quite recently, the die was designed, manufactured, and usually modified, to satisfy the requirements of the press on which it was installed. Little attention was paid to the fact that the extrusion production process is an interconnected system, and to the extent to which the efficiency of the die function is influenced by other components. Today's focus is no longer on the die itself, but on the function it performs.

The Castool single-cell die ovens used by Sapa UK are designed to safely heat dies uniformly to billet temperature, quickly and accurately. The draw temperature of the die material, and the temperature that will degrade the nitride layer on the die bearing, limit the minimum length of time to temperature. To ensure that overheating is impossible, a thermocouple is located at the hottest point in the oven chamber, close to the heating elements. This is conservatively set well below these critical temperatures. The first billet is often needed to bring the new die completely and uniformly to operating temperature. This results in scrap, lost production time, and the danger of unnecessary die correction, when the basic problem is usually inconsistent die temperature.

Effective and rapid die heating reduces breakthrough pressure and allows higher performance dies to be used. It reduces oxidation of the die bearing, die deflection, core movement, and the possibility of die breakage. In addition, inferior extrusion surface-finish, resulting from over-oxidation of a die bearing, is eliminated.

Reader Reply No.80

Company Profile

Pyrotek equipment plays a vital role at Sapa UK

Sapa Profiles in the UK is a four-press operation on two sites with an installed capacity of over 50,000 tonnes per year. As well as offering a large number of standard profiles, the company can help customers design the perfect extrusion for their particular application, stocking over 25,000 different dies. Standard alloys extruded include: 6060, 6063, 6063A, 6463, 6005A and 6082. The company's commitment to the environment is also well established and its in-house remelt facilities at Tibshelf recycle scrap consume only 5% of the energy used to produce the raw material.

Pyrotek has installed a SNIF unit at Sapa, Tibshelf and also supplies a range of consumables including: Various spares for the SNIF unit; Titan thimbles; N-17 transition plates; Insural 140 table refractories used on the two sizes of casting tables operated at SAPA, and also Coveral flux.

The SNIF SHEER unit installed at Sapa's in-house remelt facility at Tibshelf is a model P-60U. The technology from SNIF Pyrotek comprises an in-line aluminium refining system. SNIF[®] stands for Spinning Nozzle Inert Flotation. SNIF[®] Systems are deep vessel units, employing one to three nozzles, depending on the user's metal flow rate and hydrogen reduction requirements.

The P-60U model SNIF SHEER[®] is a double-noz-

zle system providing a nominal continuous refining rate of 60,000 lb (27,000 kg) per hour. The equipment consists of a 30-kW-rated refining furnace, four removable electric immersion heating elements encased in silicon carbide immersion sheaths, process controls and furnace heating controls. The most significant design feature of the P-60U is its quickly and easily replaceable pre-fired refractory furnace-lining cartridge.

Amongst the consumables supplied to Sapa Profiles by Pyrotek, the Titan[™] Thimbles act as a transition piece to transfer molten aluminum from the hot top refractory troughs to the billet mould. The precise casting of the attachment ring groove ensures tolerances for a compatible and uniform mating with the cross feeder trough and the transition plate. The smooth inner surface reduces build up of aluminium oxides, minimising maintenance.

Pyrotek N-17 is a graphite-fibre-reinforced, high-purity, calcium-silicate board developed exclusively for the non-ferrous casting industry. The patented formulation of Pyrotek N-17 makes ensures optimum strength, low shrinkage and resistance to thermal shock. Pyrotek machine-shops are equipped with CNC tooling equipment to produce complex components to customer specifications.

Reader Reply No.82

Lubricants for aluminium extrusion



Service Extrusion Consultants in Gloucester has been supplying both SAPA plants in the UK with CANMIST saw lubricants and CANMIST precision lubricant applicators for more than 10 years. The CANMIST range of lubricants was developed by Amcol Corporation specifically for the aluminium extrusion industry. HD Canmist is used on the finish saw and does not stain the profiles during the ageing process and 331WLX, which has good heat extraction properties is used for sawing billets at the press. The latest development from Amcol is the 46ILX (M5) lubricant which can be used to lubricate the hot billet, the fixed dummy block and the shear blade as well as a general lubricant for container sealing surfaces etc replacing graphite. It is now being used by some extrusion companies as a replacement for boron nitride powder. The saw lubricant applicators are now fitted with biaxial hoses instead of the conventional coaxial hose to simplify repairs.

Reader Reply No.83



General view of the run-out table, part of the new press layout at Tibshelf