



ALUMINIUM CASTHOUSE TECHNOLOGIES

IN PARTNERSHIP WITH





ACT is owned and managed by the Courtenay family, also shareholders and directors in aluminium grain refiner producer MQP. MQP's parent company is Sitong Group, one of the largest producers of master alloys in the world and manufacturer of MQP's high efficiency Optifine grain refiners.



TRANSFORMING CASTHOUSE TECHNOLOGIES

FROM OUR PIONEERING BATCHPILOT FURNACE WEIGHT MEASUREMENT SYSTEM TO OUR BONE ASH-FREE CASIFLUX LAUNDER COATING AND ENVIRONMENTALLY-FRIENDLY REFINING FLUXES, ACT IS IN THE BUSINESS OF TRANSFORMING CASTHOUSE OPERATIONS AND IMPROVING MELT QUALITY.

Every product is developed by the company's expert professionals in aluminium technology and complementary disciplines, many of whom have worked for some of the biggest names in metals production and manufacturing in the world.

We also work closely with some of the best and most revered research institutions. These include BCAST at Brunel University London, ensuring we stay ahead in innovation to benefit global casthouses and help them reduce their operating costs.

Crucially, ACT actively supports the industry by working alongside their casthouse personnel and has agents, distributors and technical personnel all over the globe to provide product information, technical help and back-up services.



BATCHPILOT™
FURNACE HEEL & TRANSFER WEIGHT
AUTOMATED SYSTEM

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BATCHPILOT™

FURNACE HEEL & TRANSFER WEIGHT
AUTOMATED SYSTEM

**15%
INCREASE
IN PRODUCTION**

PIONEERING FURNACE WEIGHING SYSTEM

KNOWING THE CORRECT WEIGHT OF METAL IN THE FURNACE IS CRUCIAL TO ACHIEVING 'RIGHT FIRST TIME' BATCHING AND ENSURING SLABS ARE CONSISTENTLY CAST TO THE PRECISE LENGTH ORDERED BY THE CUSTOMER.

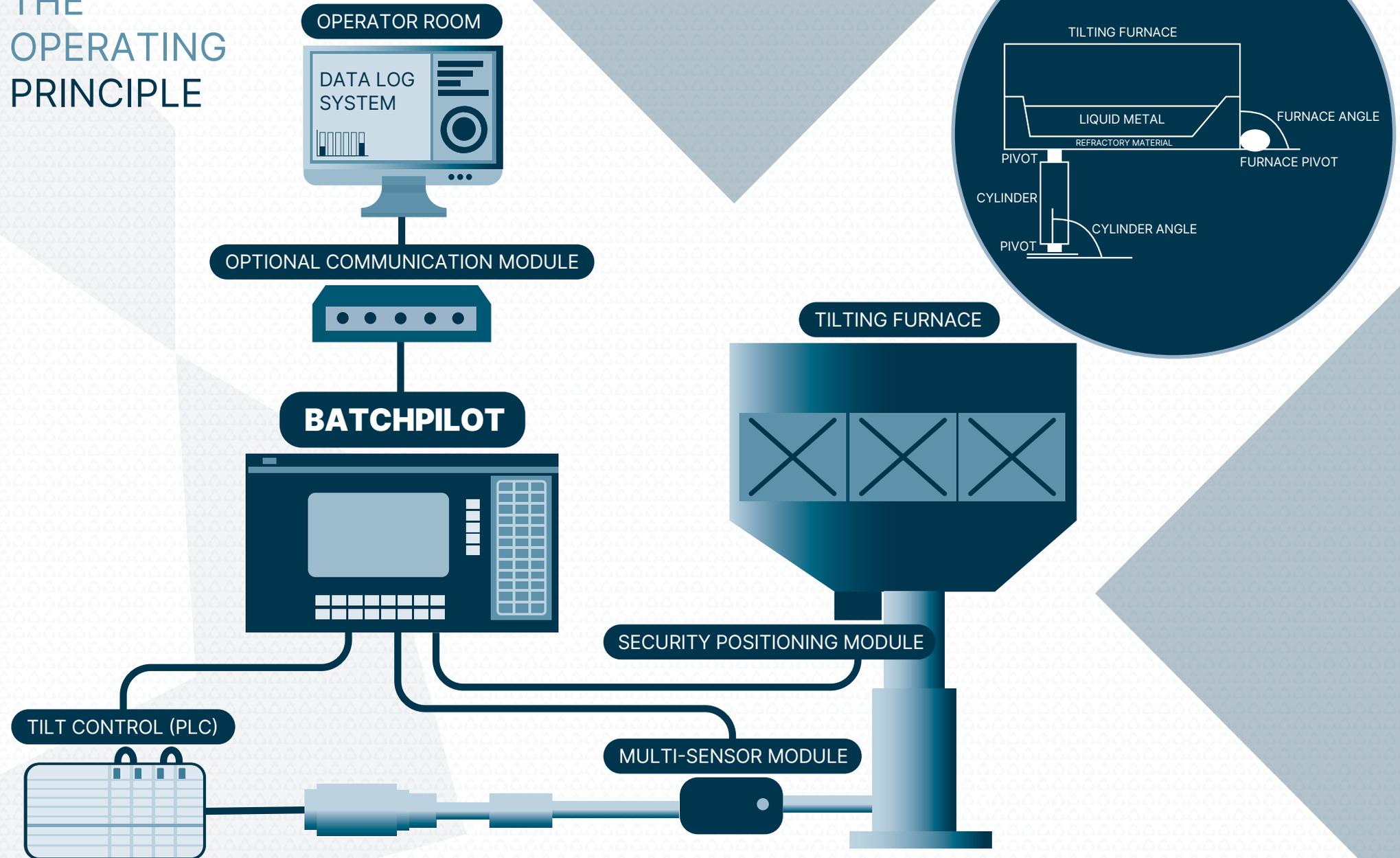
BatchPilot is an electronic system developed with unique technology that enables casthouses to accurately measure furnace heel weights and transfer weights and determine what is wanted aluminium and what is unwanted dross.

It means casthouses don't have to rely on visual estimates of furnace heel weight, which are notoriously unreliable, often leading to short casts, overfilling of the furnace, failure to meet aim analysis or potentially restricting the number of slabs cast, all hugely wasteful.

Bringing an overall increase of more than 15% in production without the need to install new capacity, the system has an accuracy of +/- 200kg and makes operations even more efficient, all powered by Industry 4.0.



THE OPERATING PRINCIPLE



BATCHPILOT BENEFITS

INCREASING 'RIGHT FIRST TIME' BATCHING,

- INCREASE IN NUMBER OF INGOTS PER CAST
- ELIMINATION OF SHORT CASTS
- INCREASE IN YIELD DUE TO REDUCTION IN OVERLENGTH CASTING
- ENERGY SAVINGS DUE TO REDUCED FURNACE WAITING TIMES

ALL LEADING TO INCREASED PRODUCTION AND HIGHER PRODUCTIVITY
CAN BE TAILORED AND CUSTOMISED TO INDIVIDUAL CUSTOMER NEEDS

OTHER BATCHPILOT BENEFITS

Easily fitted to existing furnaces without interruption of production, it is a simple, fully automated, retro fitted device that is fully integrated into the batching process.

It is also installed with the latest Siemens S7 central processing unit and software for an even more accurate online process data logging and more user-friendly smart screens, allowing customers to achieve greater gains in productivity.

FULLY AUTOMATED
USING LATEST **SIEMENS S7CENTRAL**
PROCESSING UNIT

ACCURACY OF **+/-200KG** ON
HEEL WEIGHT AND **+/-500KG**
ON FULL FURNACE WEIGHT FOR
A TYPICAL 50T FURNACE



**RETURN ON
INVESTMENT
PAYBACK
TIME FOR A
BATCHPILOT
FITTED ON A
50MT FURNACE IS
LESS THAN
THREE MONTHS**



BATCHPILOT™ CASE STUDY

**17%
INCREASE
IN PRODUCTION
CAPACITY**

BATCHPILOT DELIVERS FOR ALUNORF

ALUNORF, THE WORLD'S BIGGEST ALUMINIUM ROLLING AND CASTING MILL, ARE LEADERS IN THE PRODUCTION OF HOT AND COLD ROLLED ALUMINIUM STRIPS.

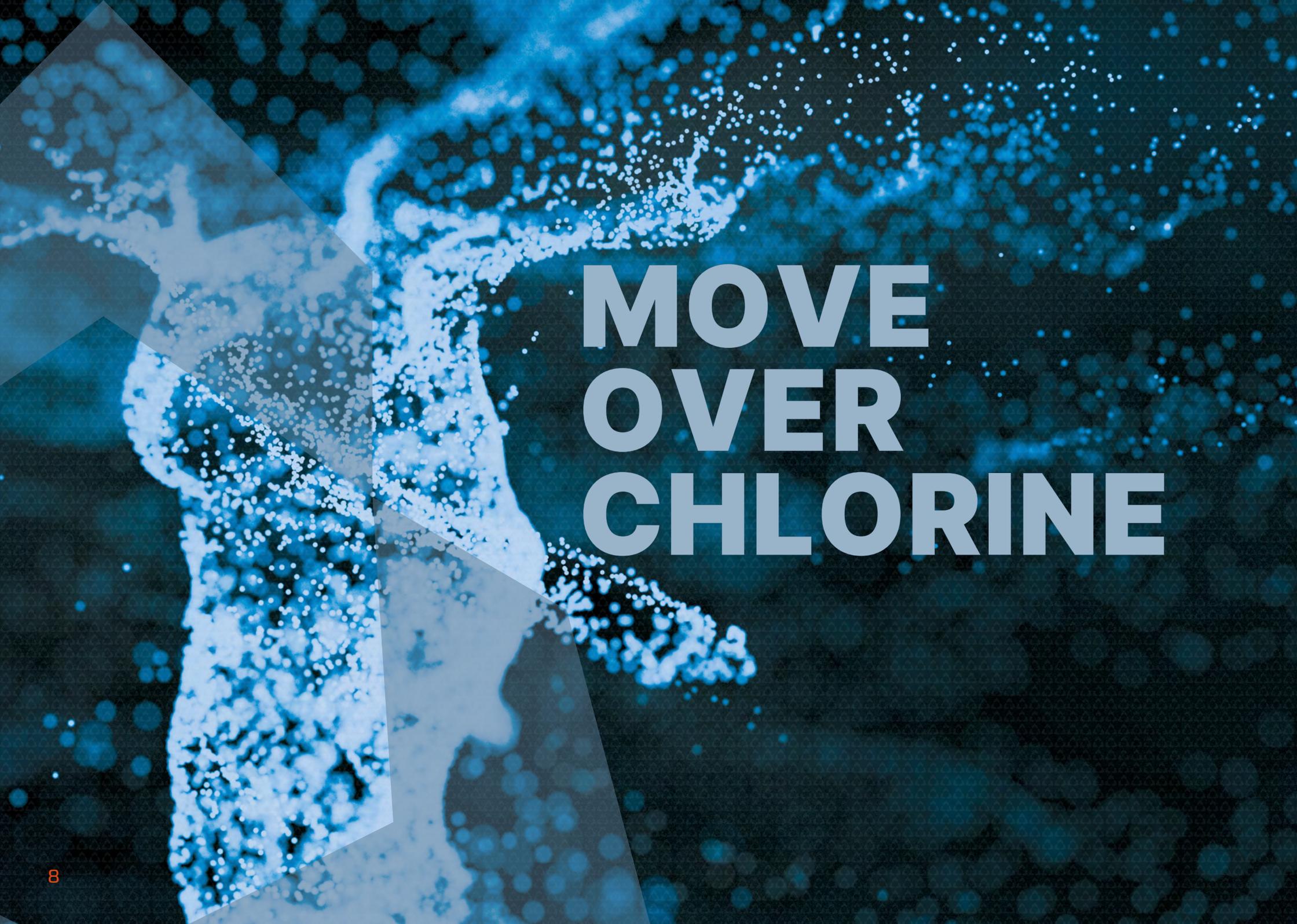
Around 1.5 million tons of rolled aluminium leave its 577,000m² factory in Neusse in Germany every year, its customers using this to produce cans, foils and offset printing plates through to automotive parts. In fact, around every second beverage can in Europe is pre-produced in the factory, which has its own recycling centre.

Within the melting area, Alunorf wanted to optimise the number and sizes of slabs being produced per cast to increase production capacity and introduced BatchPilot system to have better control of transfer weight and metal weight in the furnace. The plant saw fantastic results.

THE MEASURING ERROR IN FURNACE HEEL WEIGHTS HAS BEEN REDUCED TO LESS THAN 1% OF THE FURNACE HEEL WEIGHT AND THE INCEDENCE OF SHORT CASTS NOW REPRESENTS LESS THAN 1% OF PRODUCTION.

The BatchPilot has been successfully used at Alunorf for over a decade now, as well as being installed in over fifty major casthouses around the world.





MOVE OVER CHLORINE



THE EVOLUTION OF FLUXES

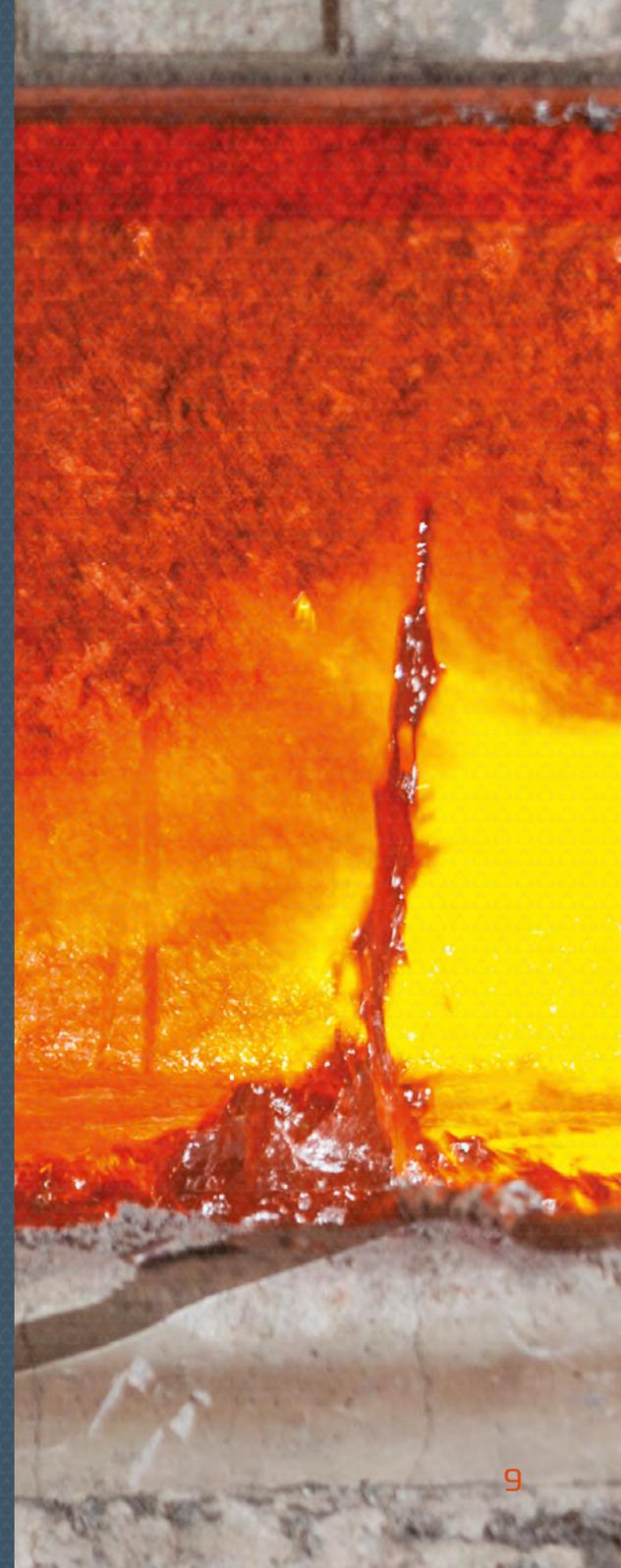
SINCE THE 1990S, FUSED REFINING FLUXES HAVE BEEN IN WIDESPREAD USE AS A MEANS OF REDUCING SODIUM IN THE MELT AND CLEANING LIQUID ALUMINIUM.

Traditional practice was to inject chlorine gas, mixed with argon or nitrogen, into melting or holding furnaces, reducing hydrogen and alkali metals, as well as metallic and non-metallic inclusions. However, in shallow furnaces, this created large bubbles and low residence time, resulting in acid gas and toxic particulates and presenting major health and safety concerns in its use and control in the casthouse.

Various measures, including installing alkali scrubbers, were brought in to improve chlorine efficiency and reduce emissions at source, but these were expensive and produced noxious liquid and solid residues which needed to be disposed of.

Powder fluxes were the initial answer, but these presented their own problems, including high moisture pick-up and a poor working environment due to airborne dust.

ACT was instrumental in introducing a new way, developing a range of single fused fluxes to combat all the challenges. With sustainability at the heart of aluminium production today, they, crucially, give casthouses an environmentally-friendly alternative to chlorine gas and offer a host of other advantages.





REFINAL™

FUSED REFINING FLUXES

OUR REFINAL RANGE OF ENVIRONMENTALLY-FRIENDLY, FUSED GRANULAR REFINING AGENTS OFFER AN ALTERNATIVE TO CHLORINE FLUXING IN THE FURNACE TO REMOVE ALKALI METALS AND INCLUSIONS WHEN ADDED TO MOLTEN ALUMINIUM ALLOYS.

Supplied to smelters worldwide, the products are the result of extensive development, producing formulations which offer enhanced performance at a lower cost to casthouses.

REFINAL RANGE

- **REFINAL 350** BASED ON A MINIMUM 35% MAGNESIUM CHLORIDE
- **REFINAL 352XF** BASED ON A MINIMUM 35% MAGNESIUM CHLORIDE WITH THE ADDITION OF FLUORIDE, FURTHER ENHANCING PERFORMANCE AND INCREASED EFFICIENCY BY UP TO 25%
- **REFINAL 565XF** BASED ON PARTIAL SUBSTITUTION OF THE POTASSIUM CHLORIDE CONTENT WITH UP TO 30% SODIUM CHLORIDE TO REDUCE COST
- **REFINAL 600** BASED ON MINIMUM 60% MAGNESIUM CHLORIDE



NEW REFINAL™

HAL F7

NEW TO OUR REFINAL PORTFOLIO IS REFINAL HAL F7, THE RESULT OF A PARTNERSHIP WITH OCULATUS CONSULTING, FOUNDED BY BOB WAGSTAFF, FORMER HEAD OF RESEARCH AT NOVELLIS.

This new invention, in the field of fluxes for removing oxides commonly found in light scrap used in remelts, is unique due to its ability to remove the very fine oxide particles, below 12 microns in size from the melt. This was significant because, while existing fluxes could cope with removing the larger particle sizes, > 15 microns, they were unable to remove the highly damaging, ultra fine particles which lead to blocked filters and aborted casts.

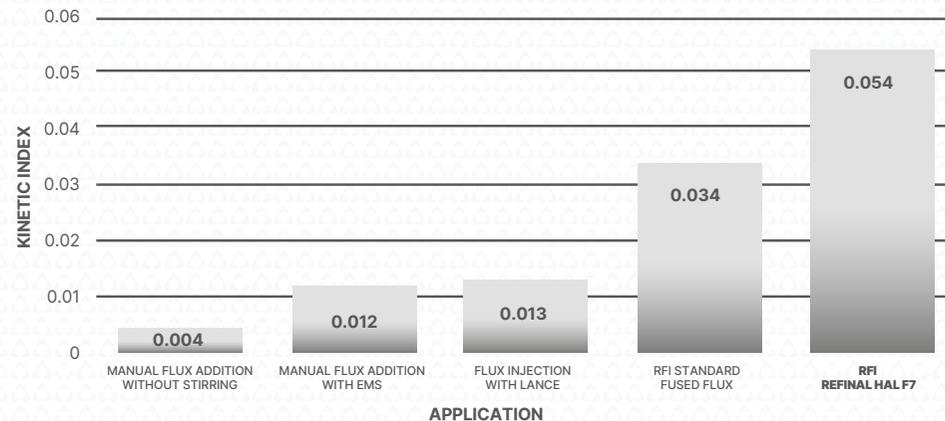
REFINAL HAL F7 is now in production use at a European producer of specialist high quality grades and providing excellent results in removing < 12µm oxides and preventing filter blockage.



THE SCIENCE

Reaction kinetics have shown that the rate of removal of alkalis using different addition methods can be compared by the rate removal constant (k). The k value is much higher and, therefore, alkali removal greater when using the RFI and the k value is particularly high when using Refinal with added fluoride.

COMPARISON OF KINETIC INDEX FOR DIFFERENT ADDITION METHODS





REFINEX™

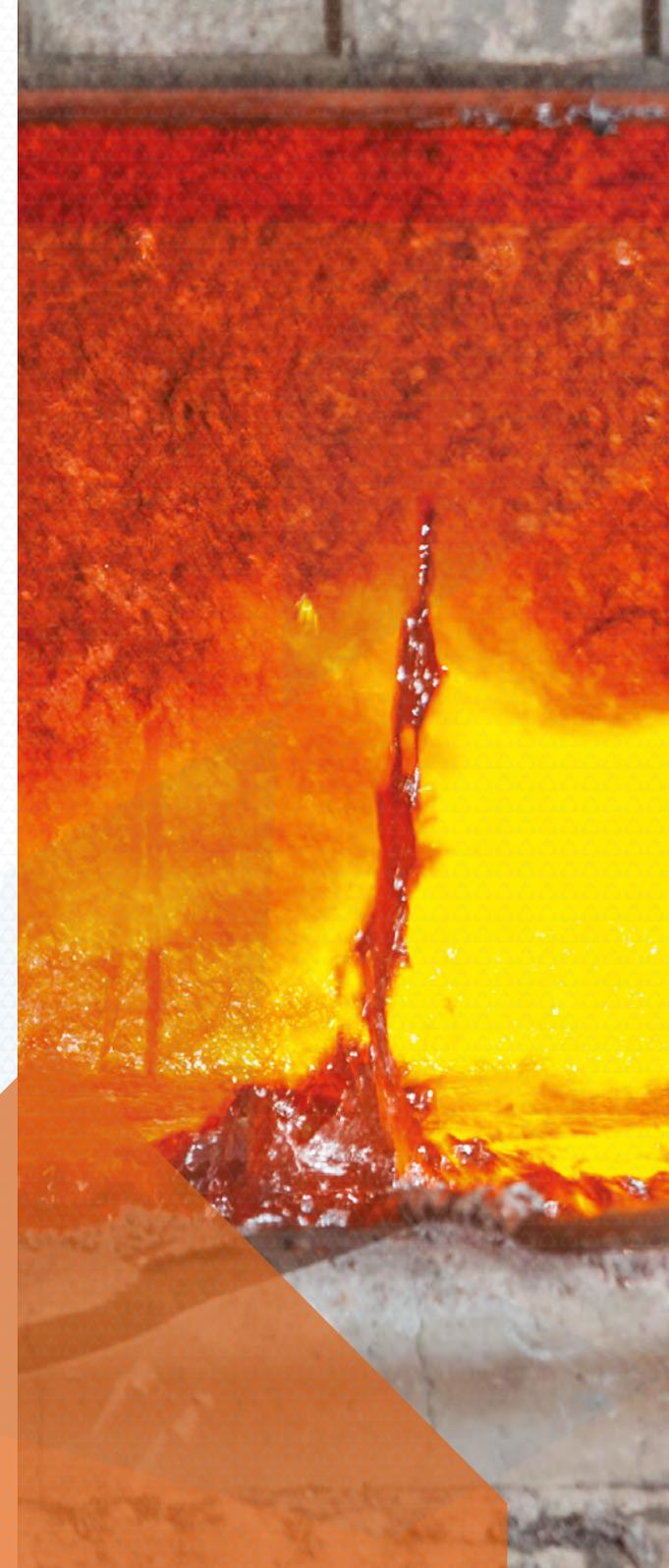
DROSSING & COVERING FLUXES

REFINEX IS OUR RANGE OF FLUXES FOR COVERING, PROTECTING AND CLEANING MOLTEN ALUMINIUM, REDUCING OXIDATION LOSSES OF ALUMINIUM DURING MELTING AND IMPROVING THE YIELD OF MOLTEN METAL FROM THE CHARGE.

They are also excellent for modifying aluminium, silicon alloys, for recovering aluminium from dross, for reclaiming chips, turnings and borings and for removal of oxide build up on furnace walls.

Crucially, our drossing-off fluxes absorb oxides and non-metallic inclusions, reducing inclusions in the castings and the loss of metal through the dross, while our furnace cleaning fluxes retain the melting capacity and efficiency of the furnace, while improving the life of the refractory lining.

**DRASTICALLY REDUCED
OXIDATION LOSSES
DURING MELTING**





CASIFLUX™

BONE ASH FREE LAUNDER COATING

ENVIRONMENTALLY-FRIENDLY
NO HAZARDOUS GASES

BONE ASH HAS, FOR MANY YEARS, BEEN ROUTINELY USED IN THE ALUMINIUM INDUSTRY AS A REFRACTORY SEALANT AND A RELEASE AGENT.

As a dry powder, it can be used to seal gaps and cracks in refractory launders and as aqueous slurry, it protects metal working tools and functions as a release agent for items such as sow pans and casting pins.

However, when in contact with molten aluminium, bone ash can be chemically reduced to form metal phosphides, which can react with water molecules to form phosphine gas, a toxic, noxious substance and potential hazard.

Our Casiflux launder coating is bone ash-free and based on specially selected grades of wollastonite, a natural calcium silicate, to give as near as possible the same effectiveness as bone ash without the potential hazards of phosphine generation.





OUR CUSTOMER SERVICE

CENTRAL WAREHOUSING IN AN LME ACCREDITED FACILITY IN EUROPE MEANS DELIVERY TO CUSTOMERS IS EASY FAST AND RELIABLE.

Strong technical service ethos and commitment to first class customer service.



WORKING IN PARTNERSHIP

ACCREDITED WITH CERTIFICATIONS INCLUDING MEMBERSHIP OF THE ALUMINIUM STEWARDSHIP INITIATIVE (ASI) AND ACCREDITATIONS TO ISO 9001, ISO 14001, IAF AND IATF16969.

ACT also continues to be involved closely with academic and industrial research establishments in sponsoring innovative projects related to casthouse technology and bringing the results into the industry.





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