



ALUMEC

MOULDING THE FUTURE

Advanced specialised alloys
for today's moulding
technologies

Alumec High Performance Mould Materials

As the undisputed world leader in aluminium alloy products, Alcoa is uniquely placed in terms of expertise and resources to develop advanced specialised alloys for aerospace, marine, transport, construction, industrial and engineering applications.

Among the many plate products and cast forging stock manufactured for export worldwide from the Alcoa Europe Kitts Green mill is a comprehensive portfolio of ultra-high performance alloys optimised for plastic mould tooling: the Alumec range.

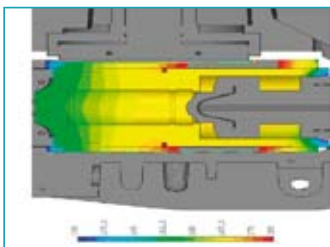
Alumec products are specifically engineered to maximise the operational advantages of using aluminium alloys for today's moulding technologies, including injection moulding, RIM, structural foam moulding, vacuum forming, blow moulding and rubber moulding.

For our clients throughout the world, the business benefits of switching to Alumec are borne out by decades of experience: superior machinability, ease of handling and optimum product quality. Using the same exacting manufacturing standards as employed in supplying aerospace materials, Alumec provides the reassurance of exceptional consistency in terms of quality, reliability and performance. Together with significant cost savings throughout the production lifecycle from initial machining to eventual disposal, these operational advantages combine to deliver a significant competitive edge over both steel and generic aluminium alloy alternatives.



Engineered for maximum profitability

Using Alumecc moulds rather than steel substantially reduces production costs in several ways:



Faster and less costly fabrication

Being so much easier to machine, Alumecc moulds can typically be made in a third of the time of a steel equivalent, with corresponding savings in fabrication costs. (Ancillary components such as fittings, pillars and bushes are cost neutral, as conventional steel components can be used.)

Lower operational costs

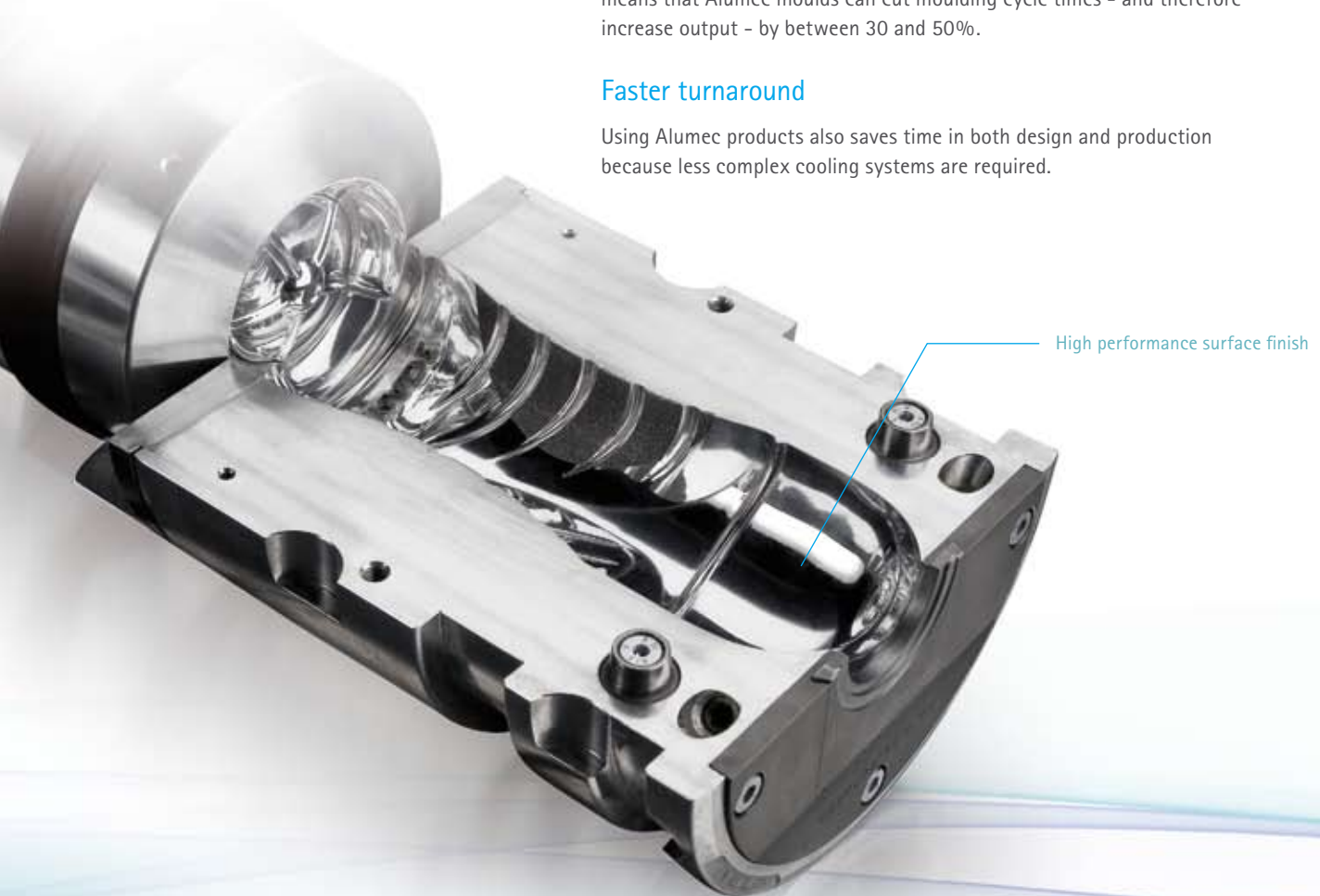
Alumecc moulds weigh anything up to 60% less than steel equivalents, so they're easier to handle and stock, and exert less strain on your process machinery. As well as extending press life in this way, specifying Alumecc also reduces your expenditure on tooling, machinery set-up, mould maintenance and ongoing consumables.

Massive productivity gains

The thermal conductivity of aluminium being many times higher than steel means that Alumecc moulds can cut moulding cycle times - and therefore increase output - by between 30 and 50%.

Faster turnaround

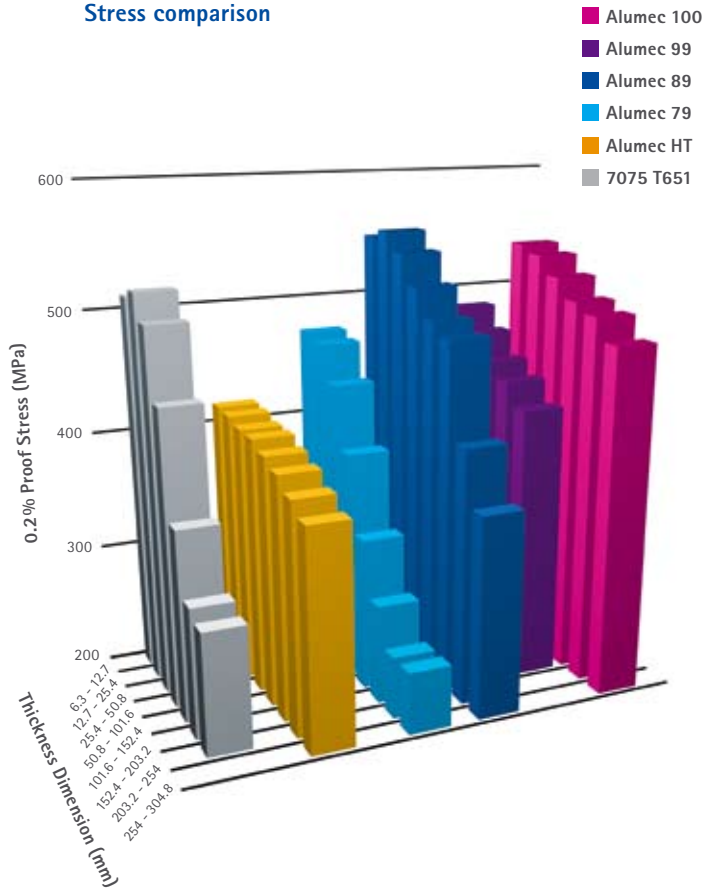
Using Alumecc products also saves time in both design and production because less complex cooling systems are required.





Alumec – strength and consistency

Aluminium mould materials 0.2% Proof Stress comparison



Superior machinability and finishing

With metal removal rates at least four times greater than steel, Alumec has excellent machinability and is easy to spark and wire erode. High performance surface finishes are equally simple to achieve with a wide range of processes including chemical nickel, hard chrome and hard anodising. EDM polishing and photo-etching deliver more uniform results compared to steel, and the consistently reliable microstructural integrity of Alumec alloys allows first class mirror finishes to be obtained for optically critical applications.

Higher product quality

Superior thermal conductivity allows an Alumec mould to cool more evenly, minimising risk of distortion in the moulded part. Together with lower capital and production costs, total product consistency and a substantially faster time to market, this marked quality gain clinches the business case for choosing Alumec.

Alumec materials – main characteristics

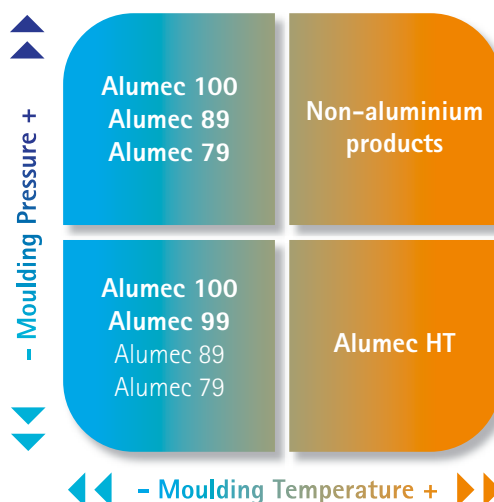
	Strength	Machinability	Polishability	Weldability	Corrosion Resistance	Heat Resistance
Alumec 100	██████████	██████████	██████████	██████████	██████████	██████████
Alumec 99	██████████	██████████	██████████	██████████	██████████	██████████
Alumec 89	██████████	██████████	██████████	██████████	██████████	██████████
Alumec 79	██████████	██████████	██████████	██████████	██████████	██████████
Alumec HT	██████████	██████████	██████████	██████████	██████████	██████████

NOT RECOMMENDABLE  EXCELLENT

The right alloy for your process

Specifically designed for precision mould applications, the Alumecc range has been developed to combine high strength and mechanical stability with outstanding machinability. Over the three decades since the brand's introduction, new Alumecc alloys have been developed to satisfy the enhanced performance requirements of specific moulding technologies, such as improved weldability and resistance to stress corrosion or sustained high temperatures.

For the specifier, this gives the reassurance of knowing that the performance characteristics of an Alumecc mould will exactly match process requirements every time, with all that implies in terms of reliable long-term operation. Alumecc alloys are supplied fully heat treated, with no further treatment required.



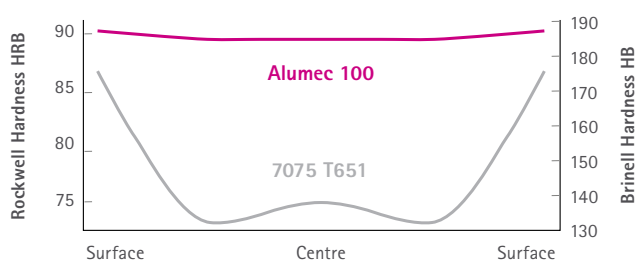
Alumecc 100

- derived from advanced aerospace technology
- highest strength Alumecc product combined with excellent machinability, durability and stability
- improved toughness
- improved corrosion resistance
- even better through thickness hardness consistency than Alumecc 89
- easily repair welded with gas tungsten arc (GTA) or gas metal arc (GMA) welding processes using 2319 filler wire. Alternatively, 5356 can also be used

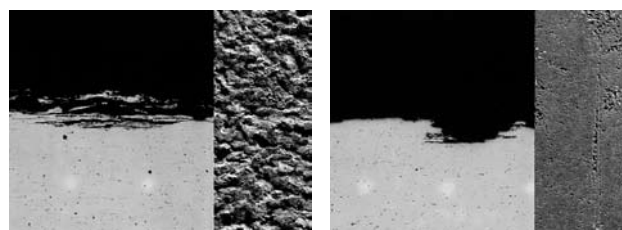
Sizes: plate thickness up to 305mm

Applications: higher volume injection moulding application requiring superior wear resistance and polishability

Alumecc 100 – 7075 Through thickness hardness comparison (140-160mm thick plate)



Alumecc 99 – 7075 T651 Exfoliation performance comparison



7075 T651 – Severe intergranular attack

Alumecc 99 – Only pitting

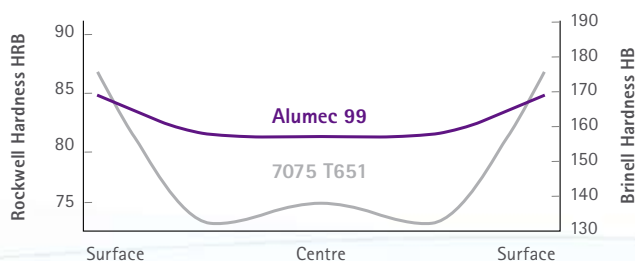
Alumecc 99

- increased resistance to cooling channel corrosion and stress corrosion cracking
- higher strength than Alumecc 79 and 7075-T651
- excellent through thickness hardness consistency
- easily repair welded

Sizes: plate thickness up to 305mm

Applications: processes requiring prolonged use, such as blow moulding

Alumecc 99 – 7075 T651 Through thickness hardness comparison (140-160mm thick plate)



Alumec 89

- even higher strength than Alumec 79, with excellent machinability and stability
- even better through thickness hardness consistency than Alumec 79
- easily repair welded

Sizes: plate thickness up to 305mm and round bar up to 200mm diameter

Applications: more demanding injection and blow moulding applications requiring superior wear resistance and polishability

Alumec 79

- high strength with excellent machinability and stability
- greater through thickness hardness consistency than 7075-T651
- more sustainable strength than 7075-T651 (especially in thick sections)
- easily repair welded

Sizes: plate thickness up to 305mm, and round bar up to 200mm diameter

Applications: injection moulding, simple thermoplastics and blow moulding

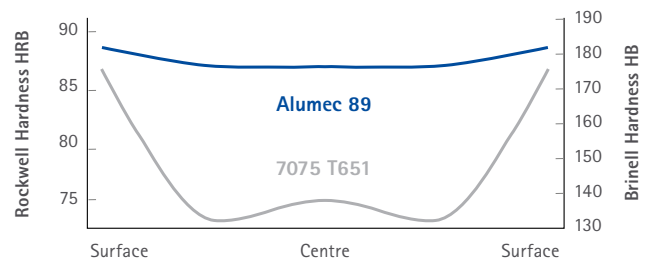
Alumec HT

- retains strength at mould temperatures up to 180°C (unlike most aluminium alloy mould materials)
- minimal variation in mechanical properties across the thickness range
- good through thickness hardness consistency

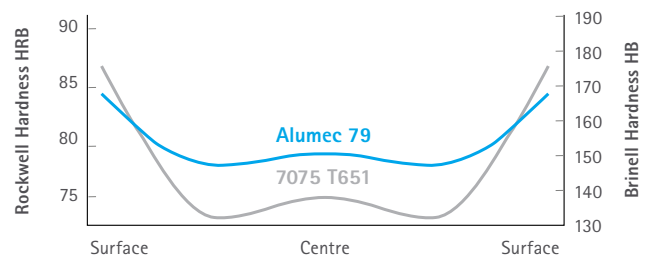
Sizes: plate thickness up to 305mm

Applications: rubber moulding

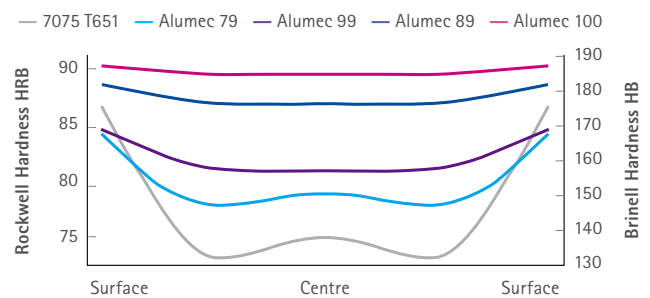
Alumec 89 – 7075 T651 Through thickness hardness comparison (140-160mm thick plate)



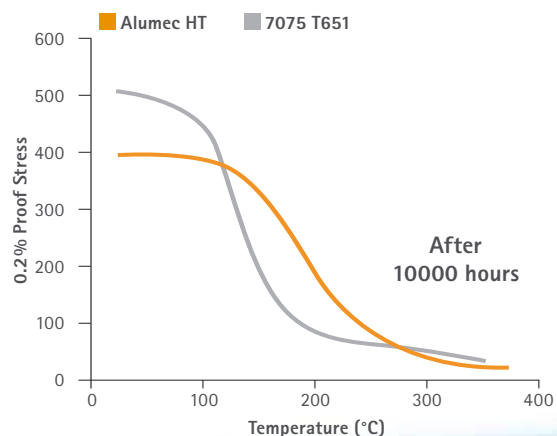
Alumec 79 – 7075 T651 Through thickness hardness comparison (140-160mm thick plate)



Comparative hardness table for all alloys



Alumec HT – 7075 T651 Effect of exposure at elevated temperature on 0.2% Proof Stress



Online technical support

The Alumec User Guide is a comprehensive technical support package for the Alumec range, with detailed information about the performance and characteristics of each product to help you select the right one for your application. In addition to a selection of case studies demonstrating the benefits of Alumec moulds in various applications, you'll find a useful problem solving section. Further additions include additional information and guidance on mould design and usage with Alumec alloys.

Access is easy – all you have to do is register online at our secure site at www.alumecuserguide.com. Alternatively, email us at alumec@alcoa.com or contact your nearest Alcoa office or distributor.



Although especially developed for moulding applications Alumec is frequently used in industrial applications for its strength, machinability and polishability.

