Beyond **Aluminium**

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Aluminium
for the world

Product Brochure

The future is **Aluminium**

More than ever, with sustainable and efficient practices becoming the norms, governments and industries around the world realise the long term benefits of Aluminium. The intrinsic and alloy properties of the metal such as strength, lightweight, versatility, durability, conductivity, and most importantly aluminium's recyclable benefits make it ideal for a multitude of industrial applications.

As a rather young metal with just over 140 years of history in commercial use, aluminium has great potential, which can be explored for new applications. Aluminium's prospects as the metal of the future are bright and at Aluminium Bahrain B.S.C. (hereinafter referred to as "Alba"), we are leading the way in shaping it.

Four Decades of **Excellence**

Established in 1971 in the Kingdom of Bahrain, Alba is a pioneer smelter in the Middle East where strategic expansions have made it one of the largest single site aluminium producers in the world.

Since inception, Alba has been known for its technological strength and innovative practices. Building on them we have performed exceptionally well in terms of both product quality and quantity. Sustained modernisation and improvements have enabled Alba to achieve the current production capacity of over 860,000 metric tonnes per annum of high quality aluminium. Our unwavering commitment to deliver top-class metal enabled us to maintain aluminium purity levels of 99.7% and above.

A state-of-the-art production system plays a key role in Alba's success. Our infrastructural strength is formed of 5 reduction lines, 3 cast houses, a dedicated carbon plant, a 550,000 mtpa coke calcining plant, a water desalination plant, 11 fume treatment plants, a marine terminal, and a 2,265 MW power plant consisting of 4 power stations.

Providing more benefits to customers, Alba supplies a range of value added products: extrusion ingot (logs and billets), sheet ingot (Rolling slab), foundry alloy ingot (standard and properzi ingot forms). Other aluminium products in the company's portfolio include standard and T ingot forms and liquid metal.

Alba supplies around 50% of its output to the local downstream industry, supporting the progress of Bahrain's economy; the rest is exported to regional and global markets. Prompt and professional technical support also helps us in building strong and enduring customer relationships.

As a responsible corporate citizen, we have consistently proved our commitment to build a sustainable environment both commercially and ecologically. Significant investments have been made in environment management, pollution control and waste treatment facilities to comply with relevant ISO systems in quality, environment and safety. Alba also ensures a safer workplace across the plant by implementing the latest safety systems and applying best practices. We are also in the forefront of investing in our human assets, providing excellent training to improve employees' competency and morale.

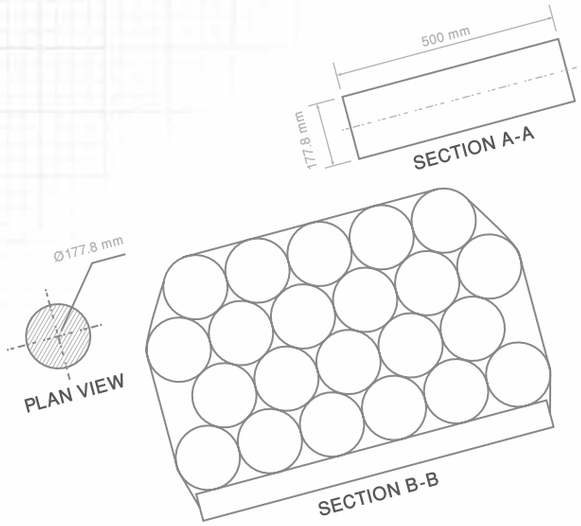
Alba's efforts on these fronts have won prestigious local and global awards; however, nothing fills us with pride as the thriving environment and the healthy society around us.

Today, global demand for aluminium exceeds current supply and it is estimated that by 2015, around 15% of global aluminium output would be from the Middle East. Alba has the capability to capitalise on this huge opportunity with our strengths in production, customer service and supply of value added products.

Keeping a finger on the pulse of customers' needs and putting innovation at the core of our operations, Alba is poised for the requirements of today and the future.

Products of
Pure Value

1. Extrusion Ingot (Logs and Billets)



Our lives are touched each and every day by one of the many types of profiles produced from aluminium extrusion ingots. Their end use applications can be found in architecture, transport, general engineering and even kitchens.

As the basic material for a variety of profiles, aluminium extrusion ingots – either in log or billet form – are amongst the most widely used value added products.

They offer the flexibility to be extruded into a broad range of extrusion profiles that meet the demanding production related needs of manufacturers.

At Alba we supply the highest quality extrusion ingots to facilitate efficient extrudability and manufacture of high quality extruded products.

The length of the extrusion ingot supplied starts from 500mm and the commonly used log form has a saleable length of up to 7,600mm. Logs that are 5,800mm and 7,000mm in length can be shipped in containers, and customers can cut them into shorter length billets by using a saw or hot shear.

Depending on profile production requirements, cut billets can be extruded in solid and hollow forms.

Alba's outstanding quality control measures in alloy composition, internal soundness, surface quality, dimensional tolerances and metallurgical characteristics guarantee a superior extrusion performance of billets; making them highly preferred in markets worldwide.

Extruded profiles are widely used in medium to higher strength products and their good surface finishing facilitates value added surface finishing applications such as anodising and powder coating.

Extruded profiles from the "soft alloy" billet supplied by Alba find their use in a variety of architectural and building applications while the "hard alloy" billet supplied by Alba profiles are commonly used in engineering and transport applications.

The consumption of hard alloy extruded profiles is increasing in the fast growing automobile industry, and Alba's annual production capacity of above 350,000 tonnes of extruded ingots is catering to this growing demand.

Currently, Alba produces and supplies the following types of Aluminum Association (AA) USA 6000 series alloys:

- AA6060 soft alloy
- AA6063 soft alloy
- AA6106 soft to medium strength alloy
- AA6005A medium strength alloy
- AA6061 medium to high strength alloy
- AA6082 high strength alloy

In addition, as a company focusing on customers' needs, we meet their specific demands for alloy composition variants within the above alloy series.

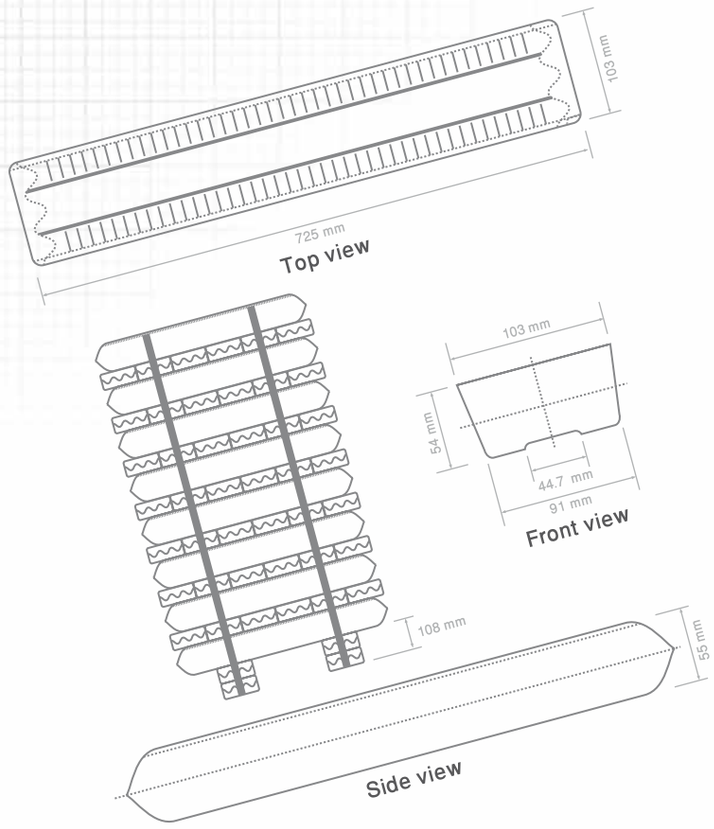
The diameters of the extrusion ingot supplied by Alba and tolerances on the diameters are listed below:

DIAMETER	TOLERANCE
152.4 & 177.8mm	±1.0mm
203, 216, 228.6 & 254mm	±1.5mm

The cut length tolerances on billet and log supplied are listed below:

LENGTH	TOLERANCE
Lengths up to and including 610mm	± 5.0mm.
Lengths greater than 610mm	±8.0mm

2. Foundry Alloy Ingot (Standard Ingot and Properzi)



Whenever we drive a car or fill fuel, we come across one of the purest forms of aluminium alloy, knowingly or unknowingly! Aluminium foundry alloy ingots are common in transport and automotive applications such as in making castings for wheels, gas pump nozzles, chassis components and truck hubs – where safety matters the most.

Today, Alba supplies two grades of primary foundry alloy ingots, which differ in their Silicon content; Al-7% Si-Mg Alloy- corresponding to 356.2 and Al-11% Si-Mg Alloy- equivalent to 413.0. Both these grades of high quality foundry ingots are supplied in modified and unmodified forms.

The modification of the metallurgical structure of ingots is done by adding traces of Strontium (Sr) to meet customers' unique application needs. Since Alba supplies a total of 29 variants within the two grades of primary foundry alloys, customers also get a good choice of products to fulfil their individual requirements.

Alba makes available superior foundry alloy ingots in Standard and Properzi forms and once again our priority is to meet customers' preference.

Sourcing pristine primary metal straight from the pot rooms to casting machines, we ensure that the trace metal level in the ingot is to the lowest possible level. A completely automated casting process inclusive of degassing and filtration ensures high quality ingots.

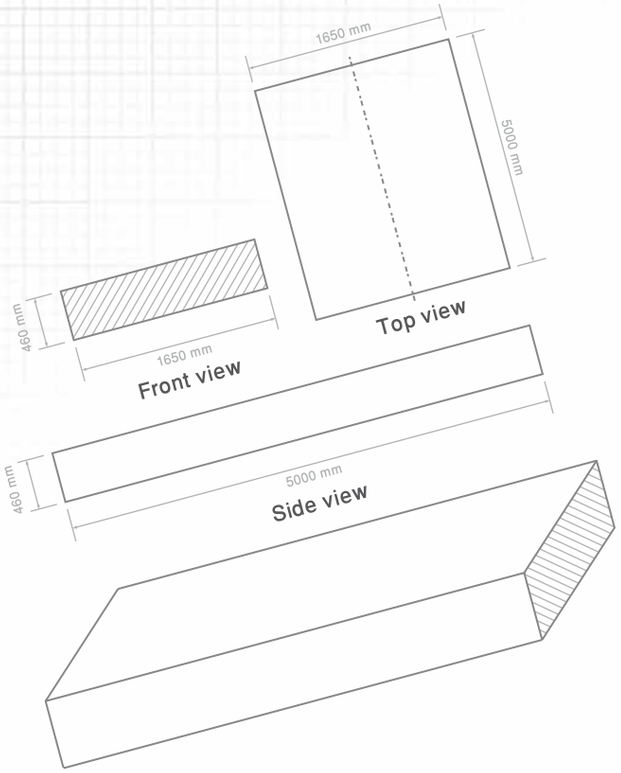
Due to the highly improved quality, Properzi ingot, made by a patented technology, is preferred by customers to boost productivity. It is uniquely shaped to offer greater convenience during packaging and storage, and it can be stacked in a relatively smaller space, reducing transportation costs.

Currently, Alba produces over 100,000 tonnes of high-quality foundry alloy ingots every year. We supply them with the guarantee of our prompt support services. It has made Alba the preferred destination for customers, especially for those in the automotive industry.

Ingot and Bundle Dimensions:

	STANDARD INGOT	PROPERZI CUT BAR
Individual Ingot Weight	22.5 kg	9.7 kg
Individual Ingot Dimensions	746x180x105mm	725x103x54mm
Number of Ingots per bundle	(i) 44 (ii) 54	109
Bundle Dimensions	(i) 746x746x950mm (ii) 746x746x1160mm	725x725x918mm
Nominal weight of Bundle	(i) 975 kg (ii) 1200 kg	1060 kg
Bundle strapping material	Zn Coated High tensile steel	Zn Coated High tensile steel
Strapping configuration	2 cross straps	2 parallel + 1 cross strap

3. Sheet Ingot (Rolling Slab)



Undoubtedly, some of the most widely used products in our daily life are made from rolling slabs. From the 0.0006mm thick aluminium foil to the 6,500mm long roofing sheets, a myriad of rolled products can be found almost everywhere. We prepare food in cookware, drink from cans and sleep comfortably with air conditioners using aluminium fin stock; all made from slabs. They are extensively used in packaging, transport and building industries as well as in general engineering applications.

Considering its widespread use, it's no wonder that sheet ingot or slab is one of Alba's major value added cast products.

Sophisticated Vertical Direct Chill (VDC) casting machines employing advanced metal level control technology and Wagstaff Moulds are used to transform primary metal from pot rooms into slabs for subsequent rolling into finished products. Superior quality is also ensured through precision processes and inline degassing and filtration equipment; the best available in the aluminium industry.

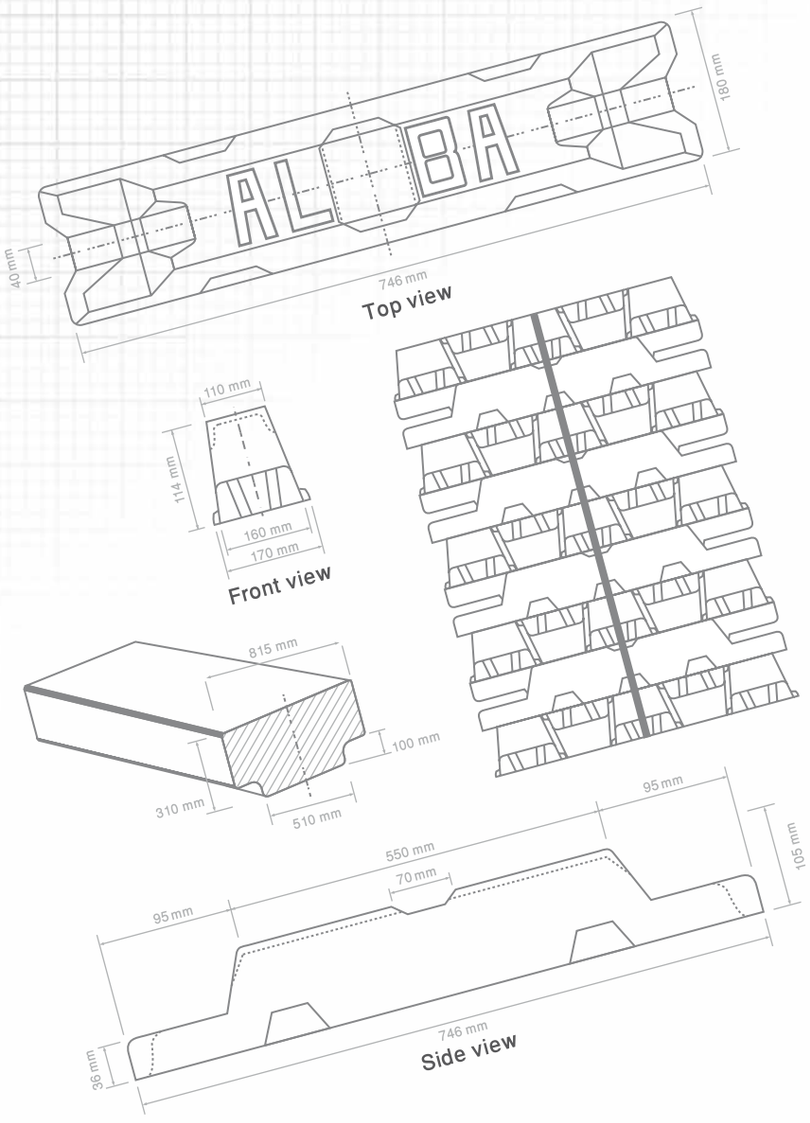
With our competitive edge in technology and systems, we supply our clients with a comprehensive range of aluminium alloys in different specifications. It includes alloys in the "Aluminum Association (AA) of USA" in the AA1xxx, 3xxx, 5xxx and 8xxx aluminium alloy series.

The following rolling slab alloys are supplied by Alba:

Alloys	1070, 1050, 1100, 1145, 1200, 1235, 3003, 3005, 5005, 5052, 8011, 8079 & 8150
Thickness (mm)	460
Widths (mm)	1030, 1100, 1200, 1290, 1350, 1500 & 1650
Standard Lengths (mm)	4700 to 5000 (other lengths are supplied as per customers' needs)

Primary **Aluminium**

(Standard and T-Ingot Forms)



It would be futile to imagine a building, automobile, electrical product or a household appliance without any form of aluminium primary ingots in them. They are ubiquitous in many re-melting applications and in casting products for subsequent fabrication into various end products such as pressure cookers in kitchens and the facades of skyscrapers.

Conforming to international specifications set by the London Metal Exchange (LME), Alba supplies the finest quality primary aluminium standard ingots. Further ensuring the quality of ingots, we have an ISO certified state-of-the-art technology at the heart of our production system. The whole process of casting primary aluminium into ingots is meticulously monitored by our quality assurance departments.

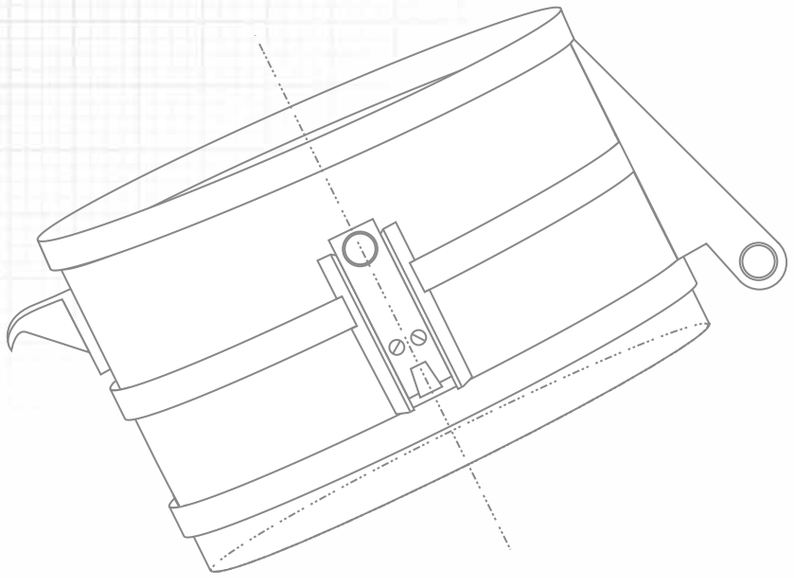
Alba alloy 1070.02, produced as per the international specification P1020/A7/Al 99.7, has guaranteed minimum purity of 99.7% aluminium.

Except for its "T" shape, the T-ingot is the same as the standard ingot in quality and specification. Its unique shape is an advantage for cost-effective handling and storage, and also suits the end users' specific furnace shape. Since both the residual forms of aluminium are made to international standards, Alba's ingots are in favour with the customers. They are used in re-melting as materials for adjusting the melt chemistry and for casting products that virtually cover the entire spectrum of aluminium's applications.

Alba makes available standard ingots in two different shapes to meet the individual needs of customers. The ingots are automatically bundled and strapped, and each bundle is marked with the cast number, alloy type and its weight for easy identification.

	1070.02 STANDARD INGOT (a)	1070.02 STANDARD INGOT (b)
Individual Ingot Weight	22.5 kg	22.5 kg
Individual Ingot Dimensions	746x180x105mm	740x170x114mm
Number of Ingots per bundle	44	44
Bundle Dimensions	746x746x950mm	740x740x1025mm
Nominal weight of Bundle	975 kg	1000 kg
Bundle strapping material	Zn Coated High tensile steel	Polyester straps
Strapping configuration	2 cross straps	3 parallel straps

Liquid **Metal**



View of crucible used in transport of liquid metal

Liquid metal from Alba is literally a hot favourite among the downstream industry in Bahrain. It can be used immediately in casting a range of products such as electrical and welding wires, wheel alloys, conductors, aluminium powders and pellets, and as a hardener alloy for subsequent re-melting operations.

We ensure its top quality before it reaches the customer.

It passes through the Treatment of Aluminium in Crucible (TAC), a process that enhances quality by reducing the alkaline earth metals such as sodium (Na). In fact, Alba treats all liquid metal it produces through the TAC process before being supplied to customers in crucibles or when transferred to the Casthouse for producing various cast products.

Liquid metal is used for aluminium products such as primary alloys and master alloys. In addition, EC rod, alloy rod, wire and alloy ingots – all based on primary aluminium – are produced from liquid metal.

Around 45% of our output – including liquid metal with minimum aluminium purity levels of 99.7% – goes to the local industries and the rest is used in-house to develop products and alloys, which are then exported to global markets.

At Alba, our commitment to supply high quality aluminium doesn't end at our dispatch counter. Rather, it's the starting point of an enduring relationship with our customers.

We make every effort to strengthen our partnership by providing proactive and prompt customer support services with our array of resources and after sales service. Our technical support is available freely to all customers and draws on over four decades of our extensive experience in various aspects of casthouse operations.

Alloys In Aluminum Association (AA):

Table # 1: Alloy specification of 1070.02-alloy:

1070.02	SI	FE	CU	MN	MG	CR	NI	ZN	B	GA	V	TI	OTHER	T.OTHS	AL
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	99.70
Max	0.10	0.20	0.03	0.03	0.03	0.03	0.03	0.03	0.005	0.03	0.03	0.03	0.03	0.10	99.99

Table # 2: Alloy specification of 1080.00-alloy:

1080.00	SI	FE	CU	MN	MG	CR	NI	ZN	B	GA	V	TI	OTHER	T.OTHS	AL
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	99.80
Max	0.08	0.10	0.02	0.02	0.02	0.02	0.02	0.02	0.005	0.02	0.02	0.02	0.02	0.10	99.99

Table # 3: Alloy specification of 1090.02-alloy:

1090.02	SI	FE	CU	MG	CR	NI	V	AL
Min	0.00	0.00	0.000	0.00	0.00	0.00	0.00	99.86
Max	0.06	0.0650	0.005	0.01	0.01	0.01	0.01	99.99

Going The
Extra Mile

Our Customer Technical Service team, as part of the Metallurgy Department, strives for proactive customer technical support. In this process we conduct extrusion and foundry alloy workshops for our customers, operational surveys in customers sites to recommend areas of improvement and also collaborate with our customers in developing alloys with enhanced performance in their production operations.

Alba's metallurgical testing and analytical facility is available at call to our customers and potential new customers for detailed study of the processes and product characteristics.

The metallurgical facility is fully equipped with optical microscopes and Bahrain's only Scanning Electron Microscope (SEM) that enables detailed viewing and identification of the composition of aluminium alloys and other materials.

In short, we provide customers with the best in products and services. They, in return, extend their loyalty to us. Thus, we have a growing list of customer partnerships. We are also committed to serve new customers in the development of product supply. Welcome to Alba. Let's be partners in success with the metal of today and the future.

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