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The Market for Aluminum Alloys in North America: Trends & Challenges

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Prices of commodities are determined by supply and demand – and aluminum is no exception. There are a multitude of different alloys (with different alloy ingredients, purity requirements, etc.) and some of them can be made from scrap secondary alloys) while others need to be made completely or to at least some extent from primary metal (primary alloys), their prices can vary compared with pure aluminum – but the price of primary aluminum is often used as a reference or basis of comparison. Although in the US more secondary aluminum is produced than primary, on a global basis primary aluminum still represents by far the greater volume than secondary aluminum. Primary aluminum is globally traded on the London Metal Exchange (LME) where the global reference price for pure aluminum (P1020A, i.e. aluminum with max. 0.10% Si and 0.20% Fe) is determined (this is the base price for the world outside of China, where the Shanghai Futures Exchange (SHFE) price is the reference for aluminum). This primary aluminum price varies constantly, so each foundry or die caster (as any processor of aluminum) has to make sure to purchase the metal at the same (or lower) price than they sell it, so the company is not exposed to meal price risk. Prices of the major alloys are published by well-accepted publications like S&P Global Platts Metals Daily or Metals Week and the American Metal Market (AMM) (mainly North America) or MetalBulletin (mainly Europe). In an ideal world, the foundry agrees with the metal supplier the same pricing (publication, reference and pricing period) as they have in the sales contract for the castings (e.g. "Prior month average as published in the Platts Metals Week"). The challenge can now be that either the customer wants to use a basis that cannot be agreed upon with the metal supplier, or simply that the reference price of the sales contract over time becomes less and less representative of the true market price at which the metal can be purchased. This has happened over the past few years with both primary and secondary aluminum, and many die casters lost significant amounts of money until the situation was corrected. So let us have a look at what happened and how we can prepare ourselves to avoid this from happening again.

Secondary Aluminum Pricing

The US secondary aluminum alloy market is composed of about 16 producers (some of them with many plants). Automotive production and aluminum content levels are the main drivers on the demand side, and scrap availability on the supply side. We distinguish between "industrial scrap" or "pre-consumer scrap" (machining chips, billet ends, extrusion scrap, etc.) – currently reduced by economic slowdown and efficiency gains – and "obsolete scrap" or "post-consumer scrap" (collected by scrap dealers, end of life) – also currently diminished due to low LME prices, low ferrous prices, and impacted by scrap imports/exports (with China now importing less scrap from the US, but Asia still taking US imports, etc.). Primary metal availability and price also impact scrap and secondary aluminum pricing, as P1020A or off-grade can always also be used to produce secondary alloys. Secondary alloy production has been outpacing scrap generation, which leads to tight scrap, which has forced the use of mill-grade scrap in A380 and other secondary alloy production. The price difference between A380 and the Midwest Transaction Price (MWTP) of primary aluminum makes integration of P1020A difficult when this spread is low, but tight scrap drives that difference (A380 price) up.

The commonly used aluminum alloys in die casting are A380, A383, A360, B390, A413, C443, etc. All of them have one thing in common: they are secondary alloys as they tolerate high levels of impurities like Fe. The most common one – A380 – is traded in very large volumes and its price is published in various publications. IN 2003 the LME launched the NASAAC contract (North American Special Aluminum Alloy Contract) and for a certain time, some North American OEMs tried using this for parts pricing and adjustment while other automakers and metal suppliers used physical market price (e.g. as published by Platts or AMM). Platts began assessing US A380 pricing in 1992 by conducting nan extensive twice-weekly survey (regarding true transactions, offers-bids) with US secondary smelters, die casters and traders/brokers for prompt delivery Midwest customer works of truckload quantities). The NASAAC price unfortunately became less and less representative of the "true market price" for A380, and therefore secondary smelters eliminated most NASAAC-linked physical supply contracts in 2012. Die casters sought alignment between metal purchase price and sales but got caught sales contract pricing and purchasing pricing that simply did not match any more. Many die casters lost significant amounts of money during this period! OEMs have since gradually moved off NASAAC to Platts A380. Now the LME NASAAC is basically only setting the A380 floor. The CME Group has launched in June this year an "Aluminum A380 Alloy (S&P Global Platts) Futures" contract. With this contract buyers and sellers can lock in forward prices and eliminate price risk exposure (hedge), it can be used to protect inventory, or enable scrap trading as a differential to a Plats A380 future instead of as an outright price. The Platts assessed sot price should converge with the traded futures price.

Most of the new "structural alloys" like Silafont-38, Aural-2/3/5S, ADC3SF, Mercalloy, etc. are (mainly)

primary type alloys and have no published prices. They are all traded at a premium over the primary aluminum price.

Primary Aluminum Pricing

Primary aluminum (P1020A) is traded on the LME – and that since 1978 (before that, prices were simply published by the few producers of primary aluminum worldwide), which gives us very good transparency and lets us secure the metal price not just now (spot price), but also into the future (in fact the LME trades commodities up to 123 months into the future, with the 3 months price being the most traded one). The LME price of primary aluminum (just like most commodities, depends on the global supply and demand (the current global balance is positive mainly due to rather significant oversupply in China, inventories (which currently are still high and therefore put downward pressure on the price), exchange rates (most aluminum is produced and consumed outside the US, so a strong USD puts downward pressure on the aluminum price which even at the LME is traded in USD), as well as (since the global financial crisis) investors, which buy when the (spot) price is low and the contango wide (i.e. the future price higher than the current price), which is said to account for certain temporary price impacts, volatility and shortening of cycle durations, but also offers a certain "floor" for the aluminum price. More than half of the global aluminum demand and supply is in China, and this is where it has been growing the most over the past decades. China is a very different market, which follows a different exchange (the SHFE) and follows different rules and regulations. Little primary (or secondary) aluminum is exported from China, but lots of semi-fabricated products including of course many castings – which can then also impact our aluminum price as it impacts our demand for locally produced castings. You might have also followed the recent debate about "fake-semis" from China, where presumably many semi-finished products were, in fact, exported only to benefit from China's export incentives, and they were actually treated as raw material and therefore re-melted when they arrived at their destinations in North America or Europe.

Most foundries and die casters purchase foundry alloys and not pure primary aluminum, and those prices are not published, but are negotiated as a premium over P1020A. In fact there are (at least) two different premiums over the LME price for pure aluminum (First there is a regional North American primary aluminum premium in order to purchase the metal exactly in this region and not just anywhere else in the world (The price of aluminum sold at the LME is the global price, but according to LME rules

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it is at the sellers discretion where the metal is made available to the buyer, which means that it will usually be in the least attractive location). So unless you want to pick up your metal somewhere in Siberia and pay for the transportation costs, insurance and any other fees to get it to your factory in the US or Canada, you will have to pay the premium for North American primary aluminum, which is called the US Midwest Premium (MWP), which together with the LME price gives us the "all in price" for primary aluminum: The US Midwest Transaction Price (MWTP). This is the delivered price to most US and Canadian destinations (not just in the Midwest), and this should therefore also be the base price of aluminum that is adjusted in the casting sales contracts. The MWP (just like he LME price) depends on the regional supply and demand of aluminum, "real" cost elements (freight, physical insurance, financing, credit insurance, LME Warehouse out-charges, etc.), inventories, imports (and where they come from), sometimes also regulatory changes (e.g. reduction of import duties), etc. The MWP is assessed by S&P Global Platts through surveys with producers and consumers, based on real transactions, firm bids and offers of full truckload quantities of 100 to 1,000mt orders and normalizing to a very detailed set of specifications, adhering to strict rules to guarantee that this is truly the accepted North American market premium for primary aluminum.

Prior to 2014, some consumers would only adjust the LME portion and as the MWP fluctuated only slightly around 5ct/lb., processors did not mind as they integrated this MWP simply into the alloy/ingot premium. Since the Global Financial Crisis (GFC) – but mainly in 2012 and 2013 – the MWP had already been rising, but in January 2014 it just skyrocketed to levels never seen before and reached around 24ct/lb. – although physical metal had actually never really been unavailable to processors or consumers. The reasons given for the premium increase were an increasing US aluminum market deficit, as well as bank financing deals, which took excess aluminum off the market after the GFC. Some consumers delayed purchasing metal in December 2013, expecting lower premiums in the new year – as a result, they were short going into 2014, and as consumers targeted lower premiums and delayed buying, producers sold to traders, who also had been left short on their commitments to consumers. Then cold weather compounded the tight scrap market and we just had the perfect storm.

This high premium was of course a huge challenge for some foundries and die casters that had sales contracts with their customers that only adjusted the LME portion, and they had only put 5ct/lb. for the MWP into the adder for alloy/ingot premium. So all of a sudden they were losing almost 20ct/lb. on the metal of every casting they sold – a true disaster! Since then most sales contracts are based on the MWTP, which is the true North American price for aluminum. Many then wondered why the premiums fell so suddenly again in 2015. The reasons given were, that with more Chinese aluminum finding its way to regional and global markets, premiums dropped in all major consuming regions and it seemed that the world's aluminum market was starting to converge. MetalBulletin stated it very precisely: "Since the GFC the premiums took on the role of reflecting the fundamentals of the aluminum market, so as the market recovered it was the premiums that saw the big increase that would have normally gone into the LME price. This is still the

case, the premiums (all in price) reflect the supply and demand fundamentals in the markets". So it is absolutely vital for every foundry and die caster to make sure their pricing/sales contracts are structured in a way that the MWTP (and not just the LME portion) are adjusted every month (or whatever the pricing period is).

In 2014 the CME started their US Midwest Premium (Platts) contract, and in November 2015 the LME launched their new regional futures contracts that would let buyers and sellers trade aluminum in the major consuming areas (on top of the base LME price), enabling market participants to hedge the regional premium, an interesting instrument if pricing periods of sales and purchasing contracts cannot be matched.

Figure 1: Aluminum spot premiums: US Midwest and European Duty paid (Source: S&P Global Platts)

Figure 1 shows well the unprecedented spike of premiums in 2014 and fall in 2015. It also shows that, during the GFC in late 2008-2009, the European Duty Paid Premium dropped almost to zero (some transactions were even made without any premium) as there was so much excess supply in the market, until producers adjusted (curtailed production) and demand increased again.

Since the global financial crisis, the aluminum market changed and aluminum also became attractive to investors (just like gold, silver, etc.), which probably saved in 2009 (at least some of) our North American aluminum producers from bankruptcy but then also brought in another forced into the demand side of the aluminum market. The North American (US and Canada) aluminum market is in a very clear (and growing) deficit and needs to attract a growing amount of imports in order to satisfy the demand. The MWP will therefore always have to be positive and at a certain level to attract foreign primary aluminum. Mexico has no primary aluminum producer, and imports from South America have dried up with smelter closures there. So the MWP has to at least be higher than freight costs from the Middle East or Russia.

As already mentioned, on top of this MWTP, there is a premium for the specific foundry alloy which depends on alloy ingredients (their relative price compared to the aluminum price), required purity (P1020A allows 0.20% max Fe while many primary foundry alloys require better purity which means a purity surcharge), ingot form (small 30lbs ingots are more expensive than alloyed sows or T bars), location of the factory and producer, volumes, etc. It is usually fixed for a certain contract period (often one year) and passed on to the casting customer as a line item in the quotation analysis form. Challenges here have been significant changes in certain alloy ingredient prices. At some point producers even imposed adjustment formulas for elements like Si (if the gap to aluminum surpassed certain levels).

Typical primary die casting alloys in North America have been silafont-36 (produced by Noranda) and Aural-2/3/5S (produced by Rio Tinto). Alcoa had so far only offered some ADC3SF in sows and T-bars but no small ingots. With Noranda filing Chapter 11, the market became very nervous about the future supply of such alloys, especially as the volumes are significantly increasing, and more and more die casters need them to make high value added structural castings for automotive and other applications. While there are some overseas producers offering these alloys, a local supply base is urgently needed to support rapid development of this market. Rio Tinto recently expanded their foundry ingot production capacity and Alcoa is now also offering their new structural alloys from their Intalco smelter (although the future of this plant is rather uncertain as the power contract is supposedly expiring in 2018 which could lead to its closure). Luckily, new smaller players like Sotrem in QC and TriAlco in Chicago-Heights (very high quality re-melters) are now producing these alloys as well (n small and large quantities). Both of them have already been qualified with different die casters/OEMs and are supplying captive and independent die casters of high integrity die castings. This certainly reassures the market that the developments will not be held up or stopped by a lack of supply of these specialty primary foundry alloys.

Conclusions

The market for aluminum and its alloys – both primary and secondary – has undergone significant changes in the past years. Metal price variation can represent a significant risk to foundries and die casters (like any processor of aluminum) and extensive knowledge of the market and vigilance regarding any changes and factors that might have impacts on future pricing need to be closely watched and analyzed. Sales and purchasing need to work together closely, and contracts on both sides need to either be synchronized in terms of price basis and pricing period, or measures have to be taken to mitigate the risk the foundry or die caster is exposed to. If this seems to be complicated and difficult to understand, then you might want to consider training classes for the relevant employees. S&P Global Platts for example is offering a one day online training class on "How the Aluminum Market Works" on December 8, 2016 and a 2-day on-site training followed by a one day hedging workshop in May 2017 in Nashville, TN. ■