



26 February 2014

The Director  
Operations 2  
Anti-Dumping Commission  
5 Constitution Avenue  
Canberra ACT 2601

## Review 229: Primary aluminium benchmark

This submission is made on behalf of Capral Ltd, a member of the Australian aluminium extrusions industry, in relation to Review 229 of certain aluminium extrusions exported to Australia from China by Alnan Aluminium Co Ltd (Alnan). We specifically refer to the cost of primary aluminium in China and previous findings that it does not reasonably reflect a competitive market cost in terms of the requirement of r.180(2)(b)(ii) of the *Customs Regulations 1926* (the Regulations). We submit that changes are warranted to the methodology for calculating a suitable benchmark for primary aluminium in China.

Customs found that the cost of primary aluminium in China was not a competitive market cost in the original aluminium extrusions and subsequent aluminium road wheels (ARWs) investigations.<sup>1</sup> We submit that the Commission should continue to find that primary aluminium is not a competitive market cost as required by the Regulations.

In both the original extrusions and ARWs cases, Customs substituted the London Metal Exchange (LME) price for primary aluminium as a benchmark cost in China. We agree that LME prices are 'indicative' of competitive market costs, however, as Capral has stated in meetings with Customs and the Commission during the original investigation and four subsequent reviews of aluminium extrusions (Reviews 186, 194, 205 and 214), the LME is a trading house, and the LME price alone is not available in any market as a cost to obtain primary aluminium in physical form.

In its report on the most recent review (Review 214) the Commission rejected Capral's claims to have this issue examined, on the basis that it was presented in the context of an accelerated review, and noted that it could be considered

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<sup>1</sup> Customs Report No. 148, p.31 at 6.1.3 and Customs Report No. 181, p.37

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during a review under Division 5 of the *Customs Act 1901*.<sup>2</sup> This review therefore presents an opportunity to have this important issue examined.

We submit that a reasonable benchmark for primary aluminium in China, relevant to normal value and Program 15 subsidy calculations, would comprise:

- LME price – as the starting reference price from a global exchange, plus
- Premiums – necessary to obtain aluminium in physical form, plus
- Cost uplift – to account for higher aluminium smelting cash costs in China.

### LME price

The LME is a global futures exchange where more than 80% of all non-ferrous metals futures business is transacted. Aluminium has been traded on the LME since 1978. The LME price is not the actual price paid for delivered metal – it is the price of a warrant traded on the exchange.<sup>3</sup>

Only a very small proportion of LME trades actually result in physical settlement and the LME refers to itself as the physical market of last resort.<sup>4</sup> Most metal in the physical market is purchased direct from smelters or merchants, however the LME provides the global reference metal price.<sup>5</sup>

### Premiums

In order to purchase physical aluminium in any market outside China, a premium must be paid on top of the LME price.<sup>6</sup> Premiums are negotiated between smelters, large traders and owners of LME warehouses.<sup>7</sup> Premiums apply equally to purchases from LME warehouses and purchases directly from smelters. Various premiums exist in different regions of the world as outlined in the Platts Metals Week's methodology and specifications guide (Platts Guide).<sup>8</sup>

The premium used in Australia is the CIF Japan Forward Quarter Premium, referred to in the industry as the Major Japanese Ports premium (MJP), which comes from the terms of the premium being CIF Osaka, Nagoya, Yokohama ports (ie major Japanese ports). The full terms are outlined in the Platts Guide. The amount of the MJP applicable to the latter part of the review period is shown in the primary billet price schedule produced by one of Australia's aluminium suppliers for August 2013.<sup>9</sup>

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<sup>2</sup> Commission Report No. 214, p.17 at 4.2.2

<sup>3</sup> Europe Economics, *A Review of the possible consequences of a change in contract terms from "in warehouse" to "FOT basis", with respect to all metals traded on the London Metal Exchange*, 20 February 2007, 'Appendix 1: The LME System' at A1.20 (Attachment A)

<sup>4</sup> *A Guide to the LME*, available at <http://www.lme.com/about-us/>

<sup>5</sup> Attachment A at A1.15

<sup>6</sup> *ibid.* at A1.20

<sup>7</sup> See recent articles discussing premiums at Attachment B

<sup>8</sup> Platts Guide at Attachment C, p.3

<sup>9</sup> Confidential Attachment D

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HARBOR Aluminum Intelligence Unit (HARBOR)<sup>10</sup> analyses global premiums. The MJP shown in Confidential Attachment D is consistent with the Japan aluminium ingot spot premiums shown in HARBOR's regional aluminium premiums outlook report from January 2013 (ie, between US\$243 per MT in January 2013<sup>11</sup> and US\$273 per MT forecast for 2013<sup>12</sup>). HARBOR's most recent analysis shows that the MJP has risen to over \$300 per MT.<sup>13</sup> There are a number of other regional premiums as described in the Platts Guide and analysed in the HARBOR reports.

Customs has consistently found that the aluminium market in China is distorted by government influence. The benchmark must represent the cost to obtain primary aluminium in physical form in a competitive market free of government influence. Premiums outside China are negotiated between private companies and we submit that these premiums represent a suitable competitive market cost to obtain primary aluminium in physical form. We further submit that the MJP would be a suitable benchmark premium, as it is used in major markets in the region including Japan and Australia. It is important to note that the MJP is at CIF (cost, insurance and freight), therefore the cost of delivery from the smelter or warehouse to Alnan must be added.

It is also important to note that the MJP is an ingot premium. The Australian industry generally purchases aluminium in billet form and pays additional premiums over and above the MJP as follows:

- XXX
- XXX
- XXX

These premiums are shown in the primary billet price schedule at Confidential Attachment X. The HARBOR reports also highlight that 'full billet premiums' are significantly higher than base ingot premiums in all markets.

Capral understands that some extruders in China purchase aluminium ingot and cast their own billets. However, to the extent that Alnan purchases aluminium billet, the Commission must be mindful of the need to include an additional billet premium. We can provide further information on billet premiums if required.

In its most recent report on aluminium extrusions, the Commission confirmed that in the original investigation the benchmark for primary aluminium incorporated the LME price plus an actual 'trading premium' paid by the Chinese exporters investigated.<sup>14</sup> None of the reports produced by Customs or the Commission have explained what this premium is for. However, we understand that it is effectively a fee charged by traders who are engaged by Chinese extruders to source supply of primary aluminium and negotiate prices

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<sup>10</sup> <http://www.harboraluminum.com>

<sup>11</sup> Confidential Attachment E, p.4

<sup>12</sup> *ibid.*, p.27

<sup>13</sup> Confidential Attachment F, p.4

<sup>14</sup> REP 214, p.17 at 4.2.2

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with the Chinese smelters. Australian extruders conduct these activities in-house. We therefore submit that this trading premium should be included in the primary aluminium benchmark in addition to a global premium. For the purposes of our calculations at the end of this submission we have estimated the trading premium to be USD 50 per MT.

### Cost uplift

The LME plus a global premium represents a competitive market cost of primary aluminium outside China, however the cash cost to produce aluminium in China is significantly higher than in the rest of the world. This is primarily due to higher energy costs and the additional cost of shipping alumina and other raw materials to China. A suitable benchmark for the cost of aluminium in China must therefore include an uplift for the higher cost.

China accounts for over 40% of global production,<sup>15</sup> yet the average cash cost to produce primary aluminium in China is around 30% higher than the for rest of the world (for example in the September quarter of 2013 the cash cost in China was USD 2,133 per MT, compared to an average of USD 1,598 per MT for the rest of the world)<sup>16</sup>. For this same period analysis shows that 48% of China's aluminium production is unprofitable (on a cash cost basis), compared to only 6% for the rest of the world.<sup>17</sup> China's smelters can only continue operations through subsidies and other government intervention in the market. This is consistent with previous findings by Customs that the primary aluminium market in China is distorted by government influence.

We submit that in order to correct these government distortions in calculating an appropriate benchmark for primary aluminium, an uplift must be made to account for the higher cash costs in China. Based on the analysis above the uplift would be approximately USD 535 per MT.

### Summary

For the purpose of establishing a suitable benchmark for primary aluminium in China, the LME price alone is not suitable, as it does not represent a price for physical aluminium. However, the LME price is a suitable starting point on which to base the benchmark, as it is used as the reference price for the purchase of physical aluminium in global markets outside China. In those markets a premium must be paid to obtain physical aluminium and we submit that the Japanese premium (MJP) is the most suitable for inclusion in the benchmark for China, as it is the premium used throughout the Asia-Pacific region including Australia.

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<sup>15</sup> Aluminum mineral commodity summary, United States Geological Survey, January 2013  
<http://minerals.usgs.gov/minerals/pubs/commodity/aluminum/mcs-2013-alumi.pdf>

<sup>16</sup> Aluminum smelting cost curve analysis, HARBOR Aluminum Intelligence Unit, October 2013, p.3 at Confidential Attachment G

<sup>17</sup> *ibid.*, p.2

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The 'trading premium' included in the original primary aluminium benchmark should continue to be included, as it merely represents a fee for activities conducted in-house by extruders in Australia and other markets.

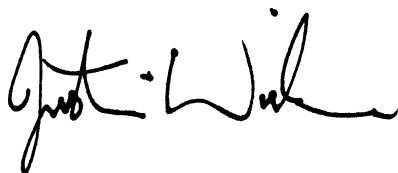
Global premiums, including the MJP, are negotiated by smelters outside China and therefore do not account for the higher cash cost of Chinese smelters. We submit that in order for the benchmark to truly represent a competitive market cost to purchase physical aluminium in China, an uplift is required to account for the additional costs in China.

Based on this analysis the primary aluminium benchmark for August 2013, which is part of the current review period, would be:

Aluminium benchmark (base alloy ingots)	Price (USD/MT)
LME	1,768
Global premium (MJP)	250
Trading premium	50
Cost uplift	535
<b>Total</b>	<b>2,603</b>

While we accept that the cost uplift is unlikely to be included in the current review, we expect the two premiums to be included in the benchmark cost of physical primary aluminium for Alnan.

We note that previous reviews have resulted in a lowering of the Chinese exporters' cost to make and sell, due to the LME benchmark being lower than the Shanghai Futures Exchange (SHFE) price paid by Chinese extruders over recent years. The addition of a global premium will result in a more realistic benchmark, however to the extent that the resulting benchmark is still less than the SHFE we submit that the SHFE should be used as the benchmark. We refer to our earlier submission of 23 December 2014 concerning non-market costs, where this issue is specifically addressed.<sup>18</sup> We reiterate that it is unreasonable to substitute an actual cost for a benchmark cost where the actual cost is higher than the benchmark.



Justin Wickes  
Director

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<sup>18</sup> Capral submission to Review 229 on non-market costs, 23 December 2014, p.2

**A Review of the possible consequences of  
a change in contract terms from “in  
warehouse” to “FOT basis”, with respect  
to all metals traded on the  
London Metal Exchange**

**A study by Europe Economics**

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**20 February 2007**

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## APPENDIX 1: THE LME SYSTEM

### The LME

- A1.1 The London Metal Exchange (LME) has a current turnover of more than \$4,500 billion per annum. The LME now trades primary aluminium, aluminium alloy, North American special aluminium alloy (NASAAC), copper, lead, nickel, tin, zinc and plastics, and plans to introduce trading in steel.<sup>17</sup>
- A1.2 The LME is the pre-eminent world exchange for base metals. LME warrants are issued in respect of metal of specified standards deposited in approved warehouses, which are then contractually bound to deliver efficiently on demand. These warrants are therefore a convenient basis for buying and selling metal, for spot and for future delivery. The obligation that warehouses will deliver means that metal producers, users and financiers can arbitrage efficiently between the warrants and other property rights in metal.
- A1.3 A variety of market players are involved in the supply or demand of physical metal in the form of LME warrants. They can be broadly categorised as:
- (a) producers;
  - (b) fabricators;
  - (c) intermediaries (including merchants, traders, and brokers); and
  - (d) LME approved warehouses.

### Roles and Responsibilities

- A1.4 The LME has three primary roles:
- (a) Hedging: the LME provides a market where participants can protect themselves against risks arising from movements in base metals and plastics prices;
  - (b) Pricing: the LME provides reference prices which are accepted globally and which are widely used in the non-ferrous metals and, to a lesser extent, in the plastics industries;
  - (c) Delivery: the approval and licensing of warehouse companies to house LME warranted metal to enable market participants to make or take physical delivery of approved brands of LME traded contracts.
- A1.5 These services are provided to LME members and through them to non-member clients.

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<sup>17</sup> The source for most information contained in this Appendix is the LME.

## LME Membership

A1.6 The LME has a membership of approximately 80 firms of which 11 actively participate in ring dealing (open outcry). An additional 31 broker members also participate in the trading of futures and options through the telephone market and LME Select.<sup>18</sup> Members of the LME may trade either as principals or as agents of their clients.

A1.7 The LME categories of membership are as follows:

- (a) Category 1 (ring dealing). Each ring dealing member is entitled to trade in the ring during the ring trading sessions. All ring dealing members, as members of the London Clearing House, are authorised under the 2000 Financial Services and Markets Act and are members of the FSA. Ring dealing members are Clearing Members who enjoy all the privileges of Membership including the right to issue client contracts and the exclusive right to trade in the Ring. They may also operate a 24 hour market by trading inter-office.
- (b) Category 2 (Associate broker clearing). Associate broker clearing members have all the privileges of ring dealing members except that they may not trade inside the ring. They also operate through the 24 hour inter-office market. They are members of both the London Clearing House and the FSA, authorised under the 2000 Financial Services and Markets Act.
- (c) Category 3 (Associate trade clearing). Associate trade clearing members may not issue client contracts or trade in the ring but they are entitled to clear their own business.
- (d) Category 4 (Associate broker). Associate broker members may issue LME contracts but are not members of the clearing house nor may they trade in the ring. They operate through the 24 hour inter-office market, and are members of the FSA, authorised under the 2000 Financial Services and Markets Act.
- (e) Category 5 (Associate trade). Category 5 members have no trading rights except as clients of a member of a higher category.

## LME Contracts and Physical Delivery

A1.8 LME contracts are traded on the exchange. A number of conditions are attached to LME contracts, of which the most relevant for this study are:

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<sup>18</sup> LME Select is the exchange operated electronic trading platform. Member firms are connected to the system which allows accredited traders to execute trades electronically. The system allows trading on all LME contracts, futures, options, traded average price options (TAPOs), and carries.

- (a) all contracts must be for the delivery of the relevant metal or plastic on a prompt date (the term used for the settlement or delivery date);
- (b) the metal or plastic to be delivered must conform to specifications set out by the LME in its Special Contract Rules, which govern matters such as quality, shape and weight;
- (c) the metal or plastic must be one of the brands listed and approved by the LME;
- (d) the metal or plastic must be held by one of the LME listed and approved warehouse companies and for which the warehouse company has issued a bearer receipt in the form specified for an LME warrant; and
- (e) metal and plastic delivery obligations are satisfied by the transfer of a warrant from seller to buyer. The warrant is backed by a specific parcel of material, a requirement not peculiar to the LME as a commodity exchange.<sup>19</sup>

A1.9 Unlike metals, plastics on LME warrant cannot be withdrawn from an LME warehouse and then put on warrant again elsewhere.

A1.10 Although the bulk of the LME contracts are closed out by an opposite contract instead of actual transfer of warrants, any party to a contract can still insist on using the actual transfer of warrant to settle the contract if they so wish.<sup>20</sup> The possibility that an actual lot of metal could be physically delivered helps to ensure that the LME price is effectively the equivalent of metal prices in the physical market.<sup>21</sup>

A1.11 The physical delivery of metals and plastics is achieved through the transfer of LME warrants.<sup>22</sup> By holding an LME warrant, the bearer holds the equivalent of a warehouse receipt for a specified lot of metal/plastic in an LME approved warehouse, issued by the warehouse after the metal/plastic has been delivered to it. An LME warrant confers ownership of the underlying metal subject to the payment of all the legitimate charges owed to the warehouse. The warrant refers to a specific lot of metal/plastic of a defined quality and brand in a specific location. Once a warrant holder wishes to withdraw

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<sup>19</sup> For instance COMEX has this as well.

<sup>20</sup> For instance, Party A and Party B enter into a one-month contract for certain amount of copper (e.g. five lots) with price of say \$1,000/lot where Party A longs (buys) the metal and Party B shorts (sells) the metal. Three days before the prompt date (delivery date) of the initial contract, these two parties could agree to enter an equal and opposite contract for settlement on the same day, which means that the two parties enter into another three-day contract where Party A would deliver to Party B the same amount of copper as specified in the initial contract (e.g. five lots) with price say of \$900/lot on the same prompt date of the initial contract. Thus the physical delivery obligations of these two contracts are equal and opposite, and there is no need to actually conduct physical delivery. These two contracts are thus settled by one party paying the net cash difference of these two contracts to the other party, which in this case is  $(\$1,000 - \$900) \times 5 = \$500$  and paid by Party A to Party B.

<sup>21</sup> The LME Warehousing Discussion Paper does briefly discuss the possibility of the LME “de-materialising” so that LME contracts will be settled instead financially. However, such de-materialising would, it is argued, place the LME in a minority of globally traded physical futures contracts. The LME system has been designed to meet the requirements of the metal industry and thus any changes not originating from the user base is regarded as damaging the LME’s relevance. The paper concludes that de-materialisation and abolishing the warehouse system are not practicable propositions.

<sup>22</sup> Technically speaking, the term ‘physical delivery’ may refer to the delivery of warrants (e.g. “the underlying asset”), rather than actually withdrawing metal from warehouses.

metal/plastic, he or she can present the warrant to the warehouse where the metal/plastic is stored, and the warrant will be cancelled before the metal/plastic is delivered out.

- A1.12 While all LME contracts provide for physical delivery of metal, the LME is generally seen as a place of supply of last resort for physical metal, and metal users normally purchase metal directly from producers or merchants in the physical market. Metal withdrawn from LME warehouses each year generally accounts for less than five per cent of annual world metal consumption.

## **LME Price**

- A1.13 Price discovery is one of the most important functions of the LME, which provides the global reference metal price.

- A1.14 In the physical metal market, prices are determined by regional supply and demand and these vary greatly by location. However, the availability of transport and financial facilities means that these prices are related to each other through arbitrage by the cost of and time taken by the movements that would be necessary to achieve price equilibrium.

- A1.15 The LME has established itself as the provider of global reference metal prices for the metals traded on it, despite the fact that the majority of world metal is traded on the physical market where metal users purchase metal directly from producers or merchants.

- A1.16 The reliability of the LME price depends on two conditions;

- (a) Physical delivery. As explained above, all LME contracts are for physical delivery, and cannot be settled until the prompt date. Market participants can thus readily arbitrage any price discrepancies between the LME price and prices in the physical market.
- (b) A liquid and deep market. Trading turnover on the LME is very high. This helps to ensure that the trades on the LME reflect the real supply and demand conditions in the physical market, and that the possibility of market manipulation is minimised.

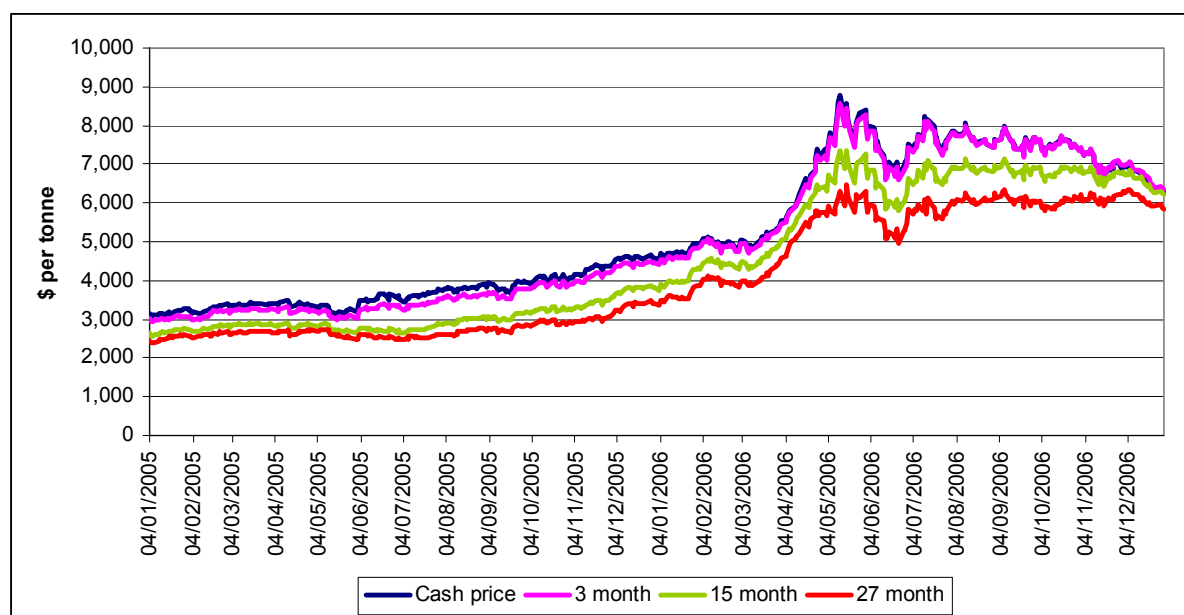
- A1.17 The LME publishes the following official LME prices daily for each metal:

- (a) cash buyer;
- (b) cash seller & settlement;
- (c) 3-months buyer;
- (d) 3-months seller;
- (e) 15-months buyer;
- (f) 15-months seller;
- (g) 27-months buyer; and

(h) 27-months seller.<sup>23</sup>

A1.18 The graph below shows how these prices compare, for example, for copper.

**Chart A1.1: Comparison of cash, 3 month, 15 month and 27 month prices for copper (2005-2006)**



Source: LME

A1.19 The term “LME price” can refer to any of these prices or to all of them as a whole, depending on the context and purpose. However, the term is most widely used to refer to the cash seller and settlement price.

A1.20 The LME price is thus not the actual price paid for delivered metal – the LME price is the price of a warrant, and the reference price for metal prices around the world. The actual metal prices, or physical prices, are normally expressed in the form of the LME price plus physical premium or discount determined, in turn, by regional differences in demand and supply, differences in brand, location and, in the case of ore or concentrates, processing costs.

## London Clearing House

A1.21 London Clearing House (LCH).Clearnet is the LME's contracted central counterparty clearing house. It clears LME contracts throughout the London business day.

<sup>23</sup> The LME does not publish 27-months official prices for lead and tin.

### *Operation*

- A1.22 An LCH.Clearnet clearing member enters into a future or option contract with another clearing member. Both sides of this trade are input into the computerised matching system, which then feeds the information to LCH.Clearnet. Assuming both parties' entries agree on time of trade, price, prompt date, contracting parties and volume, the trade is accepted as matched. The single buy/sell contract is split by LCH.Clearnet into two separate buy or sell contracts between itself and each of the clearing members respectively, enabling it to take responsibility for contract performance.
- A1.23 Non-clearing members' and clients' contracts with clearing members are not affected by clearing; they remain principals' contracts.
- A1.24 LCH.Clearnet takes on counterparty risk (e.g. the risk that one party of the contract defaults on its contractual obligations) when it accepts trades into clearing, and it covers that risk by requiring payment of margin - amounts that cover the extent of any losses a contract might show. LCH.Clearnet looks at all the positions of a clearing member when calling margins, since a clearing member may have some positions in profit and others in a loss situation, and calls margin on the basis of the clearing member's net position. Margins may be provided in cash or by other collateral such as bank guarantees.

### **SWORD**

- A1.25 SWORD is an automated software system used by the LME to keep a record of warrants.<sup>24</sup> It was designed to replace the physical movement of warrants from one holder to another.
- A1.26 SWORD can be accessed by its users, either on their own account or on behalf of their clients. Warrants registered on SWORD can be transferred centrally and this simplifies the trading procedure.
- A1.27 SWORD impacts upon the life of a warrant in the following way:
- (a) when metal is deposited in an LME warehouse (this might be metal that was already in a non-LME warehouse or has come direct from the producer/merchant to an LME warehouse) the warrant is issued by the warehouse's London Agent and is registered and held on SWORD.
  - (b) the SWORD system tracks the rents and ownership of the warrant as it changes hands and calculates the rents by reference to the rate published by the issuing warehouse. Note that SWORD does not record trades; it only records the transfer of the ownership of warrants.

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<sup>24</sup> SWORD is co-owned by London Clearing House

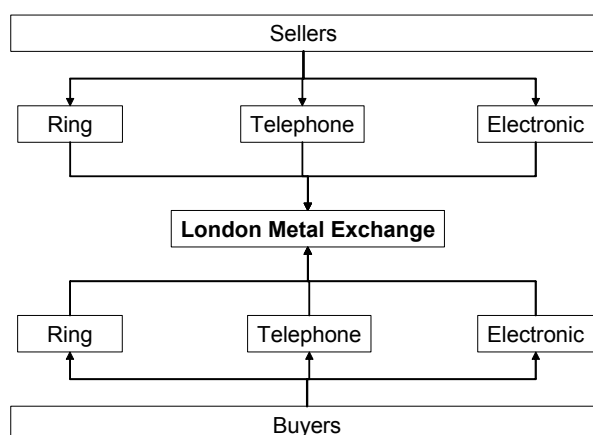
- (c) SWORD records the cancellation of the warrant prior to physical delivery of the product out of the warehouse.

## Trading on the LME

A1.28 Trading on the LME, as shown in the chart below, takes one of three forms:

- (a) open outcry market (ring trading), which is attended by representatives of the LME ring dealing firms;
- (b) inter-office telephone market, which is a 24 hour global market place transacted between member companies over the telephone;
- (c) LME Select, which is the LME's electronic trading platform.

**FigureA.1: Forms of Trading on the LME**



Source: LME

- A1.29 Through most of its history, the main users of the LME and those trading on it were metal producers, recyclers, fabricators, and metal merchants, all of whom were involved in the physical metal market.
- A1.30 In recent years, many financial investors, such as banks, pension funds, and hedge funds, have also started trading on the LME.
- A1.31 Traditional LME brokers are mostly also metal merchants in the physical market who, in the past, have provided ancillary services for metal producing and fabricating firms directly involved in the metal trade. These brokers have seen their relative importance in the LME

market decline as purely financial traders have entered the market. Interviewees in general agree that the latter category now makes up the bulk of LME trades and exerts considerable influence in determining the LME price.<sup>25</sup>

## Price Volatility

- A1.32 Price volatility is an inherent characteristic of most or all commodity markets and stems from the way these materials are produced and consumed. On one hand, any substantial increase in production levels often takes a long time to implement, and may require incremental investment; on the other hand, consumers (e.g. in the case of metals fabricators or other metal users) have a limited choice of substitutes and substitution itself may require investment. This means that neither supply nor demand is responsive quickly to a change in price and large price swings are required to balance changes in production or demand.
- A1.33 Chart A1.2 and Table A1.1 below show a more detailed picture of the volatility of official monthly average LME prices over the past 10 years. It can be seen that prices are very volatile. Between 1996-2006, the maximum prices of copper and nickel (for example) were several times higher than the minimum prices, and the standard deviation, the parameter most frequently used to measure volatility, is more than 40 per cent of the average price for the period.<sup>26</sup>

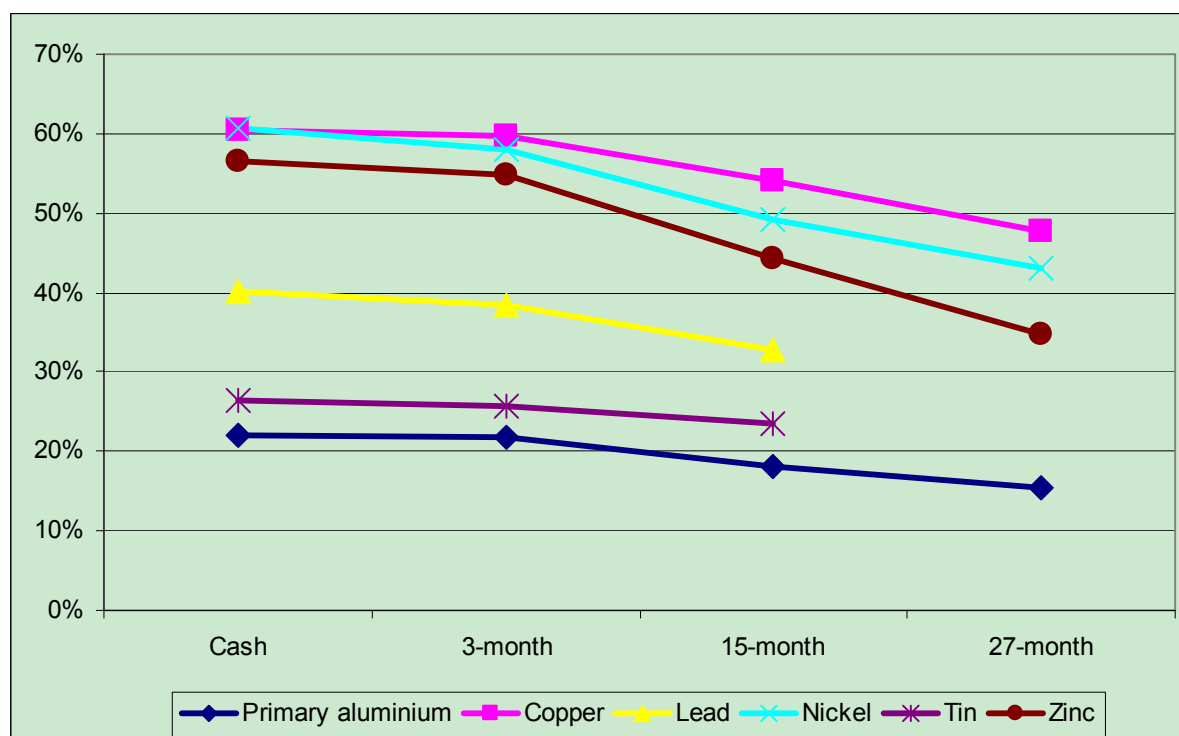
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<sup>25</sup> The divide of LME trades between traditional brokers and new financial traders was suggested to be 20:80 by one stakeholder.

<sup>26</sup> Standard deviation is defined as the spread of the values from the mean value.



**Chart A1.2: Volatility of LME price (1996-2006): standard deviation from average**



Volatility defined as standard deviation of LME prices as a percentage of average LME price

Source: Europe Economics

**Table A1.1: Volatility of Monthly Average LME Price (1996-2006)**

	Cash	3-months	15-months	27-months
<b>Aluminium</b>				
Maximum price	\$2,861.48	\$2,881.38	\$2,708.57	\$2,512.62
Minimum price	\$1,181.96	\$1,204.28	\$1,278.78	\$1,333.91
Mean price	\$1,616.81	\$1,632.28	\$1,633.11	\$1,619.00
Standard deviation (SE)	\$355.52	\$354.97	\$297.47	\$249.19
SE/Mean price	22%	22%	18%	15%
<b>Copper</b>				
Maximum price	\$8,045.86	\$7,905.24	\$6,904.55	\$6,129.32
Minimum price	\$1,377.28	\$1,399.76	\$1,460.09	\$1,499.57
Mean price	\$2,526.89	\$2,499.56	\$2,364.04	\$2,266.84
Standard deviation (SE)	\$1,526.40	\$1,494.25	\$1,279.76	\$1,079.15
SE/Mean price	60%	60%	54%	48%
<b>Lead</b>				
Maximum price	\$1,725.50	\$1,685.13	\$1,508.42	
Minimum price	\$412.12	\$428.80	\$463.00	
Mean price	\$680.03	\$677.64	\$663.89	
Standard deviation (SE)	\$272.50	\$260.30	\$217.15	
SE/Mean price	40%	38%	33%	
<b>Nickel</b>				
Maximum price	\$34,570.26	\$33,792.37	\$28,252.63	\$24,646.05
Minimum price	\$3,875.00	\$3,941.82	\$4,173.18	\$4,366.82
Mean price	\$9,900.76	\$9,788.94	\$9,071.07	\$8,508.97
Standard deviation (SE)	\$6,013.02	\$5,681.37	\$4,461.15	\$3,667.61
SE/Mean price	61%	58%	49%	43%
<b>Tin</b>				
Maximum price	\$11,158.68	\$11,033.16	\$10,482.11	
Minimum price	\$3,694.50	\$3,735.50	\$3,882.25	
Mean price	\$6,027.84	\$6,023.54	\$5,988.71	
Standard deviation (SE)	\$1,590.64	\$1,551.04	\$1,403.14	
SE/Mean price	26%	26%	23%	
<b>Zinc</b>				
Maximum price	\$4,405.39	\$4,320.50	\$3,746.79	\$3,259.32
Minimum price	\$747.60	\$768.21	\$814.10	\$832.00
Mean price	\$1,251.65	\$1,262.01	\$1,239.10	\$1,199.10
Standard deviation (SE)	\$706.87	\$692.15	\$547.88	\$416.88
SE/Mean price	56%	55%	44%	35%

Source: LME and Europe Economics

## Stocks and Trading

A1.34 The LME publishes daily reports on the stocks of metal stored in LME warehouses, and such information is widely used by market participants to infer supply and demand conditions and therefore to help to form their views on the LME price. Among these reports are statistics of warrants that have been cancelled, but not yet withdrawn from warehouses. The percentage of such cancellations to total stocks is shown in the table below.

**Table A1.1: Cancelled tonnages**

Metal	Warrant cancelled as a percentage of closing stocks (%)				
	1998	2000	2002	2005	2006*
Aluminium Alloy	2.79	1.47	8.01	2.25	5.64
Copper	23.65	11.29	4.06	15.26	9.27
Lead	2.35	5.28	7.23	7.53	3.05
NASAAC	-	-	4.77	2.57	1.86
Nickel	3.14	10.33	10.48	15.92	17.76
Primary Aluminium	5.48	7.71	5.28	11.97	7.19
Tin	9.79	5.76	7.02	7.33	16.22
Zinc	3.19	3.04	3.84	9.49	36.08

\*: Up to July 2006

Source: LME and Europe Economics calculations

A1.35 The table below summarises the percentage of cancelled warrants as a proportion of total warrants traded.

**Table A1.2: Average cancelled warrants as a proportion of total volume traded (1998-2006)\***

Metal	%
Aluminium Alloy	0.38
Copper	0.10
Lead	0.14
Nickel	0.22
Primary Aluminium	0.10
Tin	0.37
Zinc	0.14
NASAAC	0.21

\* June 2006

Source: Europe Economics calculations

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Last updated: October 10, 2013 7:18 pm

# Aluminium producers vent fury at LME changes to warehousing rules

By Jack Farchy



Crucible of molten aluminium at Alcoa's production plant in Goose Creek, South Carolina

Goldman Sachs and JPMorgan have been the focus of a storm of criticism of their metals warehouses during the summer. However, aluminium smelters such as [Alcoa](#) and [Rusal](#) may bear the brunt of the financial impact.

The companies – the world's top two producers of aluminium – have reacted furiously to a proposal by the London Metal Exchange, where benchmark prices for aluminium are set, to change its warehousing rules.

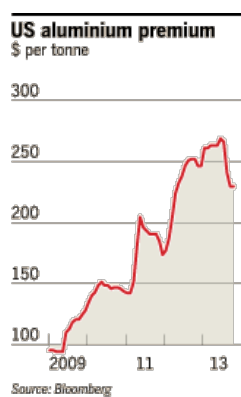
Long queues to take delivery of aluminium from LME-registered warehouses, many of which are owned by banks, have triggered a series of complaints by metal users, criticism by senators and investigations by US regulators. In response, the LME has proposed a change of rules that would eventually bring down the length of queues.

Klaus Kleinfeld, Alcoa chief executive, this week attacked the LME's actions as "very irresponsible", saying the rules were a "major market intervention".

The unspoken fear of aluminium producers and their investors is that the rule change will cause the price of aluminium to fall. That could be the last straw for an industry that has been struggling for years with oversupply amid large expansions by Chinese producers and an enormous overhang of stock since the financial crisis.

At issue is the "premium" – the cost of physical aluminium over and above the LME futures price. Since queues started to form at LME warehouses in mid-2009, premiums worldwide have jumped, with benchmark US premiums rising from \$93 to a record \$265 a tonne this year, according to Metal Bulletin data.

That is still only a small part of the overall cost of aluminium, with futures prices trading at \$1,874 a tonne on Thursday.



But it has been a lifeline for aluminium producers, struggling with prices trading at near four-year lows.

Analysts at Deutsche Bank estimate that more than 80 per cent of aluminium production in the US and China, and most of the production in Australia and India, would be lossmaking without the premium.

The LME's new rule, which still must be confirmed by its board later this month, is intended to bring down the length of the queues. As a result, most analysts and traders forecast, it will probably also bring down premiums.

"We believe that physical premiums will inevitably fall," say analysts at Barclays.

That bodes ill for aluminium smelters. Beyond Alcoa and Rusal, [Rio Tinto](#), [Chalco](#) and [Norsk Hydro](#) are also likely to be affected.

## The Commodities Note

Commodities news analysis and comment, including the latest market prices

Indeed, Alcoa this week says it believes the announcement of the proposed rule has already had an impact on the market. Since the LME made the announcement in July, premiums in the US and Europe have fallen by 13-15 per cent.

"We believe the decline in premiums is largely a result of the confusion caused by the LME's major market intervention from their July 1 announcement of proposed warehouse rule changes," says William

Oplinger, Alcoa's finance chief.

Investors have taken note. Analysts at Deutsche Bank recently downgraded Alcoa's shares, already languishing at close to four-year

lows, to a “sell” rating. Last month, Alcoa was dropped from the Dow Jones Industrial Average after 54 years.

Rusal shares have been under even greater pressure, dropping 53 per cent since the start of the year.

Not everyone agrees that the change in the LME rules will necessarily have a negative impact. Oleg Mukhamedshin, deputy chief executive of Rusal, argues any fall in the premium ought to be offset by a rise in the LME price. If queues were to fall, he says, the stock of aluminium available to the market would also fall, leading to an increase in prices.

“We believe that the effective price should be pretty much the same,” Mr Mukhamedshin says. “Price-wise nothing is going to change.”

While many traders are persuaded by that argument, most believe that it could take some time for the market to reach equilibrium. In the meantime, as the roughly 2m tonnes of aluminium currently stuck in LME queues is released, premiums and prices could both fall.

As one senior aluminium trader puts it: “The producers are the ones who are panicking. If the premium disappears, there’s trouble.”

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## [Commentary](#)

# Why Physical Aluminum Premiums May Rise in Q1 2014

by [Stuart Burns](#) on November 26, 2013

Style: [Commentary](#) Category: [Metal Prices](#), [Non-ferrous Metals](#)

There is clearly a disconnect between the expectations of sellers and buyers in the current negotiations between Japanese buyers and Western smelters, including UC Rusal, Rio Tinto plc, Alcoa Inc. and BHP Billiton, expected to start this week.

Meetings are due to take place to set the first quarter 2014 [physical delivery premiums for aluminum contracts](#) in Asia's biggest import market, Japan. Smelters are bolstered by Prime Minister Shinzo Abe and the Bank of Japan's record stimulus measures, which have spurred rolled aluminum output for three months in a row. President Abe's plan to raise the sales tax in April is also boosting short-term demand for household goods, autos and construction.

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Smelters are encouraged no doubt by the partial shutdown of Saudi Arabia's Ma'aden smelter and the end of a pact with an Indonesian supplier limiting physical supply, according to Bloomberg via [this article](#). Japanese buyers are expecting a premium to be set this quarter around US\$ 245-247 per metric ton over the London Metal Exchange (LME) price CIF Japan, but according to [Reuters](#), Rusal is looking for record-high premiums of \$270 per ton, supported by tight supply and healthy demand in not just Japan, but the wider Southeast Asian market and Taiwan.

Physical premia did fall in the aftermath of the LME's announcements in July (that they would reduce load out queues at warehouses), but they have since crept back up again. What's the outlook?

The market seems to have concluded the changes will take a long time to impact material availability, years in the case of Detroit and Vlissingen, and as such it is business as usual for the time being.

It's not even clear that the queues are the sole cause of the rising physical premiums.

According to Standard Bank, looking at the impact on US Midwest and Duty Unpaid Rotterdam premia (along with Japan, the other two major physical premium delivery benchmarks), the premium differential between the pre-queue aluminum market of 2011 and earlier and the post-queue market is around \$50-100/metric ton, the bank says.

We would put the figure at the top of that range, but the point is a good one: [the queues are not the sole cause of the high physical premiums](#) and resolution of the load out queues is not going in itself to solve the issue completely.

## Bottom Line on Aluminum Premiums

Meanwhile, it seems the pain for consumers is going to get worse before it gets better.

If smelters have their way in Asia, there will be a knock-on impact of physical premiums in Rotterdam and for the Midwest ingot price next quarter. Monitor the course of these negotiations – they will have a direct impact on the price of metal paid by consumers next year.

[Find out more about MetalMiner's price forecasting capability to help your aluminum sourcing efforts.](#)

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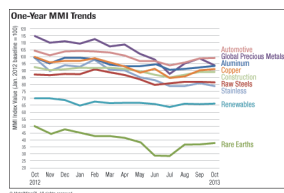
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# Smelter cuts, finance deals send aluminum premiums toward record

Tue, Jan 7 2014

By [Susan Thomas](#)

LONDON (Reuters) - Aluminum premiums, or costs to get metal out of storage, have soared to all-time highs in the United States with Europe and Asia close behind as smelters shut and spare metal is snatched up by traders for collateral in financing deals.

The rise in premiums highlights the London Metal Exchange's (LME) limited ability to cool a market where low interest rates continue to whet appetites for locking up aluminum as a form of investment.

The LME, the world's largest metals marketplace, announced big changes to its metals storage system in November after years of complaints about wait times of more than a year and large premiums to withdraw metal from the warehouses it monitors.

It outlined plans to slash waiting times to a maximum of 50 days, among other measures, which analysts and manufacturers had hoped would lead to lower premiums especially given that the aluminum market is oversupplied.

But the benchmark Platts U.S. Midwest aluminum premium jumped by three U.S. cents per pound to 15 U.S. cents per pound of metal over the LME cash price late last week, the pricing agency said.

"The fact that we are still trading at 15 cents today suggests that this was not a fluke and that we will likely stay at elevated levels for some time across all geographies," INTL FCStone analyst Ed Meir said.

U.S. producer Ormet Corp (ORMTQ.PK: [Quote](#), [Profile](#), [Research](#), [Stock Buzz](#)) said last October it would close its 270,000 tonne per year aluminum smelter in Hannibal, Ohio, casualty of historically low prices and high power costs.

Low prices and high energy costs have pushed Western producers to slash capacity, with smelter closures gathering pace in recent months.

"We're hearing that metal is quite tight, we're hearing that possibly the closure of Ormet has something to do with it," he added.

Dutch smelter Aluminium Delfzijl, which produces more than 110,000 tonnes of new aluminium a year, said it had filed for bankruptcy on December 30.

## LOCKED UP

Harbor Intelligence research institute believes that North American producers are virtually sold out of metal for January and anticipates record-high premiums for Europe, the Asian region, Mexico and Brazil over the next few weeks.

Analysts believe most of an estimated 10-15 million tonnes of global aluminium stocks are locked up in financing deals.

This involves an investor borrowing money at low rates to buy physical metal, striking a warehouse deal to store it cheaply and taking advantage of the market's existing futures price structure to sell it forward immediately at a profit.

"The Chinese keep cranking out more and more metal and they are more than offsetting whatever (production) we are losing in the West, so prices continue to come down," Meir said. "More metal is being produced but it's not ending up in the market, it's going into these financial trades so the market is tight."

Benchmark aluminium prices on the London Metal Exchange (LME) for delivery in three months are around \$1,775 per tonne, below the cost of production for a large portion of the global smelting capacity.

"It's not clear if the premium spike is sustainable," Standard Bank analyst Leon Westgate wrote in a note to clients.

"But it does appear to reflect concerns amongst traders in terms of being able to replace aluminium units in an environment that includes weaker U.S. production, reduced Canadian imports and a lack of LME material flowing out to the wider market."

(Reporting by Susan Thomas; editing by Veronica Brown and Keiron Henderson)



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# METHODOLOGY AND SPECIFICATIONS GUIDE

## Metals

(Latest Update: January 2014)

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<b>PRICE ASSESSMENTS, EXCHANGE PRICES AND LIST PRICES</b>	<b>2</b>	<b>SILICOMANGANESE</b>	<b>12</b>
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ARSENIC	5	<b>STAINLESS SCRAP</b>	<b>13</b>
BISMUTH	5	<b>TANTALUM</b>	<b>13</b>
CADMIUM	5	<b>TIN</b>	<b>14</b>
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## PRICE INDEXES

Each of these three indexes is a straight arithmetic average calculated in such a way that its value would have been 100.00 on Dec. 30, 1982. The prices averaged are usually from the next to last business day of the week. When the price is a range, the low end is used in calculating the average. MW Base Index includes Aluminum MW US Market; Copper COMEX first position plus NY Dealer premium cathode weekly midpoint; Lead North American Market; Tin NY Dealer; Zinc MW NA SHG; and Nickel Cathode NY Dealer. MW Precious Index includes Gold London Initial, Silver Comex 1st Position, Palladium MW NY Dealer and Platinum MW NY Dealer. MW Composite Index includes MW Base and MW Precious Indexes.

## PRICE ASSESSMENTS, EXCHANGE PRICES AND LIST PRICES

### ALUMINUM

#### Unalloyed primary ingot and billet prices:

**LME** – Official morning session prices on the London Metal Exchange. First price is bid, second is asked. Weekly average is the bid/asked mean; settlement is official cash asked price, with weekly average being average of that price alone. HG (high grade) is min. 99.7% purity, quoted in US dollars.

**NYMEX/COMEX** – Daily official settlement/closing prices of the New York Mercantile Exchange's COMEX division, for 99.7% purity, in warehouse on warrant at select COMEX-registered warehouses. To meet COMEX specs, reflected as futures prices for each active trading month.

**MW US Market** – Weekly estimated US free market price for prompt delivery Midwest of 99.7% purity high-grade, (arrival within 30 days). Pre-dating the LME, the price reflects an "all-in" end price for the aluminum, accounting for premiums done over the LME in a given week but also enabling for adjustments in times of LME backwardation. The assessment, published usually every Thursday, includes the LME prices and daily survey premiums for Monday through Thursday only, incorporated into a one-cent range to smooth out volatility and reflect the majority of the week's business. Monthly average of this price uses the low end of the range only, so the price tends to be lower than the Transaction price.

**MW US Transaction Premium** – Daily premium or discount to the London Metal Exchange cash price for spot physical 99.7% high-grade aluminum, delivered, duty-paid US consumer works, arrival within 7-30 days from date of publication, net-30-day terms. Assessment is expressed in cents per pound but also available on a converted dollars/mt basis. Premium or discount is determined based on physical spot deals, bids and offers reported through a daily survey of spot buyers and sellers, using a representative sample of producers, traders and different types of end users (sheet mills, remelt billet makers, extruders, rod mills, etc). Includes business for LME-deliverable, any-origin 99.7% P1020 ingot, low-profile sow or T-bars, basis delivery US Midwest. Volumes are minimum full 45,000 lb truckloads; typical order quantities 100-500 mt. Prices for volumes that are larger or smaller than the typical order size may be normalized to the standard. The daily assessment reflects delivery to a typical-freight consumer in a broad US Midwest region via truck or rail. The typical-freight delivery location

is determined to be 1.25-1.75 cents/lb from multiple suppliers or ports (freight rates updated December 2012). Deals that are reported as FOB, FCA, for non-Midwest locations or for particularly close or long freights (ie, less than/greater than the current range of 1.25-1.75 cents/lb) are normalized before inclusion in the calculations. Platts uses a matrix of typical delivery locations throughout North America and categorizes these locations as "average," "close," or "extra" freights. The "close" or "extra" freight locations are normalized to "average" based on assigned differential values of ranging from plus/minus 0.25 cents to 0.5 cents/lb, which are adjusted periodically based on market feedback on typical locational discounts or extras. Assessment reflects net-30-day payment terms from delivery (net-cash, net-5 and net-10 are normalized using typical LIBOR-plus rates or prevailing net-cash versus net-30 spreads). Deals that require a specific shape or chemistry (ie, T-bars only, no lithium) may be normalized to the stated standard specification. In the absence of repeatable concluded spot deals where a premium/discount is negotiated, the assessment takes into account firm bids and offers. Changes in the spreads on formula deals, or the premiums and discounts for other grades of aluminum basis Transaction premium, are considered for trend purposes. "Good until cancel" (GTC) deals reflecting a fixed price with non-negotiated premiums, or additional orders given as part of a frame contract, are not considered in the assessment but may be monitored for trend purposes. The assessment reflects the most-widely tradable and repeatable premium or discount value prevailing at the close of US markets, typically at 4:30pm US Eastern time. On the last business day of the month, the assessment closes by 1pm US East Coast time.

**MW US Transaction** – Daily London Metal Exchange high-grade aluminum cash settlement price, converted into cents per pound, adjusted by US free-market premium or discount for prompt delivery Midwest (arrival within 7-30 days from date of publication). (See specification for US Transaction Premium). Premium determined based on physical business reported by a daily survey of major buyers and sellers, using a representative survey sample of producers, traders and different types of end users. Includes business for LME-deliverable, any-origin 99.7% North American P1020 ingot, low-profile sow or T-bars, meeting LME specifications, basis delivery US Midwest. Volumes are minimum full 45,000 lb truckloads, typical quantities 100-500 mt.

**MW US Net-cash premium** – Daily premium or discount to the London Metal Exchange cash price for spot physical 99.7% high-grade aluminum, delivered, duty-paid US consumer works, arrival within 7-30 days from date of publication, net-cash payment terms, normalized to a broad Midwest region. The premium is determined based on a survey of producers, traders and end users to determine the prevailing spread between net-cash and net-30 terms, on a cents/lb basis. All other specifications are the same as for the US Transaction Premium (see separate reference).

**US Six-Months P1020** – Weekly estimated US free-market premium over LME for North American 99.7% ingot delivered Midwest for a period in time six months forward, based on a survey of quotes and sales during the current week for six months from that date. Reflects both physical and financial swaps business done by producers, traders and consumers.

**US Spot 6063 Billet Upcharge** – Weekly estimated US spot upcharge over current P1020 transaction price for primary, North American General Purpose 6063 billet, to Aluminum Assn. specifications, basis delivery Midwest, net 30 days terms. The range reflects the majority of spot (non-contract) business based on a survey of active sellers and buyers. Excludes secondary and import billet.

**Europe-Good Western Duty-paid Premium Rotterdam** – Duty-paid daily estimated \$/mt premium over LME cash for Western-origin 99.7% ingot meeting LME high grade specifications. In warehouse Rotterdam, 0-30 days terms, prompt delivery. Based on a survey of producers, traders and consumers (extruders, rolling mills). Began being assessed daily September 2003.

**Europe-Good Western Duty-Unpaid Premium Rotterdam** – Daily estimated \$/mt premium over LME cash for 99.7% ingot meeting LME high grade specifications. In warehouse Rotterdam, 0-30 day terms, prompt delivery, on a duty-unpaid basis. Based on a survey of producers, traders and consumers (extruders, rolling mills). Assessed daily as of September 2003.

**Europe-Russian A7E Duty-Unpaid Premium Rotterdam** – Daily estimated \$/mt premium over LME cash for 99.7% Russian origin ingot in warehouse Rotterdam, 0-30 day terms, prompt delivery, on a duty-unpaid basis. Based on a survey of producers, traders and consumers of aluminium. Assessed daily as of September 2003.

**Europe-Russian A7E FOB Premium St. Petersburg** – Daily estimated \$/mt premium over LME cash for 99.7% Russian origin ingot on a FOB St. Petersburg basis, 0-30 day terms, prompt delivery. Based on a survey of producers, traders and consumers of aluminium. Assessed daily as of September 2003.

**(DISCONTINUED)Europe** – Good Western Premium: Duty paid weekly estimated \$/mt premium over LME cash for Western-origin 99.7% ingot meeting LME high grade specifications. In warehouse Rotterdam, 0-30 days terms, prompt delivery. Based on a weekly survey of producers, traders and consumers (extruders, rolling mills). Replaced with daily price effective September 2003.

**(DISCONTINUED)Europe** – Russian A7E Premium Rotterdam: Weekly estimated \$/mt premium over LME cash for 99.7% Russian origin ingot in warehouse Rotterdam, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of aluminum. Replaced with daily price effective September 2003.

**(DISCONTINUED)Europe** – Russian A7E Premium St Petersburg: Weekly estimated \$/mt premium over LME cash for 99.7% Russian origin ingot on a FOB St Petersburg basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of aluminum. Replaced with daily price effective September 2003.

**(DISCONTINUED)Europe** – Russian A7E Premium Novorossiysk: Weekly estimated \$/mt premium over LME cash for 99.7% Russian origin ingot on a FOB Novorossiysk basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of aluminum. Discontinued as of September 2003.

**CIF Japan Spot Premium** – Daily spot premium or discount to the London Metal Exchange cash settlement price for high-grade aluminum. Minimum 99.7% primary aluminum meeting LME P1020A chemical specifications, CIF main Japanese ports of Yokoyama, Nagoya or Osaka, all origins, except excluding Iran, India, Egypt and LME warehouses. The assessment is expressed in a narrow price range reflecting the majority of business or spot bids/offers for ingot, T-bars and sows, minimum volumes of 250 mt, cash within 3 days of bill of lading, or cash against documents. Cargo leaves ports during or following the month of transaction. Platts surveys market sources, gathering information from a representative sample of traders, consumers, producers and brokers deemed reliable and active in the spot market. Platts contacts sources based in Japan, Australia, Russia, Europe, the Middle East and other Asian countries.

**CIF Japan Forward Quarter Premium** – Premium or discount to the LME price at time of shipment for minimum 99.7% primary aluminum meeting the LME P1020A chemical specifications, CIF main Japanese ports of Yokoyama, Nagoya or Osaka, origins excluding Iran, India, Egypt and LME warehouses. The premium range reflects the majority of concluded quarterly contracts for minimum 500 mt/month volumes, in ingot, T-bars or sow form, cash within 3 days of bill of lading, or cash against documents. Cargo leaves ports during or following the month of transaction. Platts surveys market sources, gathering information from a representative sample of traders, consumers, producers and brokers deemed reliable and active in the market. Platts contacts sources based in Japan, Australia, Russia, Europe, the Middle East and other Asian countries. The final quarterly assessment range will be published in advance of the start of the quarter, usually by the first date of the quarter, or once the majority of buyers and sellers have concluded negotiations. The number of deals typically included in the assessment ranges from 10 to 20.

**C&F China Western** – Daily estimated premium for 99.7% (0.1% Si, 0.2% Fe) Good Western aluminum in the form of ingots, sows, T-bars, over LME cash for C&F China aluminum business. Cargo leaves port upon receipt of letter of credits, usually within one month following the transaction. Delivered to main Chinese ports such as Huangpu, Shanghai, Fuzhou, Qingdao, Zhongshan, Zhuhai, and Hong Kong. Under consideration to be changed to CIF China.

**C&F China Russian** – Daily estimated premium for 99.7% (0.1% Si, 0.2% Fe) Russian aluminum in the form of ingots, sows, T-bars, over LME cash for C&F China aluminum business. Cargo leaves port upon receipt of letter of credits, usually within one month following the transaction. Delivered to main Chinese ports such as Huangpu, Shanghai, Fuzhou, Qingdao, Zhongshan, Zhuhai, and Hong Kong. (Under consideration for change to CIF, Chinese origin only)

**In-Warehouse Singapore** – Daily estimated premium for 99.7% (0.1%Si, 0.2% Fe) material of all origin, mainly Indian, Chinese, and some Russian and Western, in-warehouse Singapore. Cargo released immediately upon payment.

## Secondary alloy ingot prices

**LME Alloy** – Official morning session prices on the LME. First price is bid, second is asked. Weekly average is the bid/asked mean; settlement is official cash asked price, with weekly average being average of that price alone. Aluminum alloy delivered under this contract shall be: A380.1 alloy produced in conformity with the Aluminum Assn. specification; 226 alloy, produced in conformity with GDB-AISi9Cu3 as described in DIN standard 1725; and D12S alloy, produced in conformity with JIs H2118-1976, Class 12. (Note: this specification to be read in conjunction with the provision that there be an allowance as follows: Others, total 0.50% max. Al balance). Lot sizes are 20 mt and in US dollar per mt. Cash price started Feb 1, 1993.

**LME North American Special Aluminum Alloy Contract** – Aluminum alloy conforming to the special North American A380.1 specification; size of lot is 20mt (with a tolerance of +/-2%). Delivery is daily from cash to 3 months (first prompt date two working days from cash), then every Wednesday from 3 months to 6 months. Then every third Wednesday from 7 months out to 27 months forward. The aluminum delivered under this contract shall be in the form of: ingot in the weight range of minimum 4kg to maximum 17.3kg; small sows in the weight range of minimum 408kg to maximum

590kg; large sows in the weight range of minimum 567kg to maximum 726kg; and T-bars in the weight range of minimum 408kg to maximum 726kg. Warehouses are located in Baltimore, Maryland; Chicago, Illinois; Detroit, Michigan; and St Louis, Illinois.

**A-380 Alloy** – 8-9.5% Si, 1% Fe, 3-4% Cu, 0.5% Mn, 0.1% Mg, 0.5% Ni, 2.9% Zn, and 0.35% Sn. Estimated twice-weekly (Monday-Thursday) market price for prompt delivery Midwest, customer works, payment net-30 to net-60 days, 45,000-lb truckload amounts. Price represents a range of spot transaction prices conducted by a survey of US secondary aluminum smelters, diecasters, foundries, automotive companies, traders and brokers. Price started in 1992.

**US 319, 356, F132, A-413.1, F-132 and B390** – Twice-weekly price assessment ranges for major secondary aluminum alloys. Delivered Midwest customer works, payment net-30 to net-60 days, 45,000-lb truckload quantities. Assessed twice per week, on Mondays and Thursdays (except for changes during holidays), through a survey of US secondary aluminum smelters, diecasters, foundries, automotive companies, traders and brokers. The assessments reflect the narrow low-high price range, in cents/lb, of the majority of concluded deals, bids and offers. The impurity levels represent the Aluminum Assn. specifications or typical market specifications for 319.1, 356.1, 332.2, A413 and B390, respectively, as follows: **319.1** – 5.5-6.5% Si; 0.8% Fe, 3.0-4.0% Cu; 0.50% Mn, 0.10% Mg, 0.35% Ni; 1.0% Zn, 0.25% Ti. **356** – 6.5-7.56% Si; 0.50% Fe; 0.25% Cu; 0.35% Mn; 0.25-0.45% Mg; 0.35% Zn; 0.25 Ti. **F-132** – 8.5-10.0% Si; 0.6% Fe; 2.0-4.0% Cu; 0.20 Mn; 0.9-1.3% Mg; 0.10% Ni; 0.10% Zn; 0.20% Ti. **A-413.1** – 11-13% Si; 1% Fe max; 0.6% Cu max; 0.35% Mn; 0.1% Mg; 0.5% Ni; 0.5% Zn; and 0.15% Sn. **B390** – 16-18% Si, 1.3% max Fe, 4.0-5.0% Cu, 0.50% Mn, 0.45-0.65% Mg, 0.10% Ni, 1.4% Zn and 0.20% Ti. Price assessments for 319, 356, and F132 started in April 1993; A413 started in 2010 and B390 in 2013.

**Europe – Secondary Aluminium 226 Price (Started Sep 1, 2003):** Weekly estimated Eur/mt price for secondary aluminium alloy 226 LME grade on a delivered works basis 0-30 day terms, prompt delivery. The alloy is produced in conformity with GBD-ALSi9Cu3 as described in DIN standard 1725 (1986). Based on a survey of producers, traders and consumers of aluminium. Price assessed weekly and published on Fridays.

**ADC12 ex-works China:** Platts assessment for ADC12 Alloy to conform to JIS standard – 9.6-12% Si, 0.9% Fe, 1.5-3.5% Cu, 0.5% Mn, 0.3% Mg, 0.5% Ni, 1% Zn, and 0.2% Sn. Spot prices assessed weekly on Tuesday or closest working day. The assessment reflects the domestic market price, on a spot trade basis, in yuan per mt, ex-plant from a typical supplier. The spot price represents a range of spot transactions, bids and offers determined by surveying Chinese secondary aluminum smelters, diecasters, foundries, automotive companies, traders and brokers.

**ADC12 FOB China:** Platts assessment for ADC12 Alloy to conform to JIS standard – 9.6-12% Si, 0.9% Fe, 1.5-3.5% Cu, 0.5% Mn, 0.3% Mg, 0.5% Ni, 1% Zn, and 0.2% Sn. Spot prices assessed weekly on Tuesday or closest working day. The assessment reflects the export market price, on a spot trade basis, in \$/mt, FOB Chinese ports, mainly Shanghai and Tianjin. The spot price represents a range of spot transactions, bids and offers determined by surveying secondary aluminum smelters, diecasters, foundries, automotive companies, traders and brokers in China, Hong Kong and Japan.

### Scrap prices.

**US Old Cast** – Aluminum castings for consumption by secondary aluminum smelters, crushed cast, shreddable, less than 1% Mg and Zn, low Fe, low contamination; minimum recovery rate 92%; cents/lb, within 30-day delivery US Midwest. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers. Price started in July 2000.

**US Old Sheet** – Non-cast aluminum items for consumption by secondary aluminum smelters to meet ISRI “taint/tabor” specification; cents/lb, 30-day delivery US Midwest. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers. Price started in July 2000.

**US Mill-grade MLCCs** – Mixed-low copper clips able to be consumed by aluminum rolling mills, 1000, 3000, 5000, 6000 series only; cents/lb, 30-day delivery US Midwest. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters, scrap dealers and rolling mills. Price started in July 2000.

**US Smelter-grade MLCCs** – Mixed-low copper clips for consumption by secondary aluminum smelters, loose, bare, new, no contamination, free of 2000 and 7000 series; cts/lb, 30-day delivery to US Midwest. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers. Price started in July 2000.

**US Turnings** – Machine and tooling scrap for consumption by secondary aluminum smelters; high grade, clean and dry; cts/lb, 30-day delivery US Midwest. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers. Price started July 2000.

**US UBCs** – Baled used beverage cans, to meet ISRI “taldon” specification; cents/lb, delivered US Midwest. Assessed once a week, usually on Thursdays, reflecting the range of spot business concluded by consumers and mid-to-large scrap dealer/consolidators/brokers. Business that is reported as non-Midwest or FOT (picked up) is adjusted to reflect average US Midwest delivery. Price started July 2000.

**US 6063 Press Scrap** – New 6063 extrusion press scrap, direct from presses, billet with butts included. Expressed as a cents/lb discount below US Midwest P1020 Transaction price, delivered US Midwest cast houses. Assessed once a week as the range of discounts most commonly concluded on a spot basis, via a survey of primary producers, extruders and scrap dealers. Price started September 2000.

**US Painted Siding** – Siding consisting of clean, low-copper aluminum siding scrap, painted one or two sides, free of plastic coating, iron, dirt, corrosion, fiber, foam or fiberglass backing or other non-metallic items, for US Midwest delivery within 30 days. Assessed once a week, usually on Thursdays, through a survey of scrap dealers and rolling mill buyers. Price started in March 2006.

**US High-grade auto shreds** – Auto shreds generated through a heavy media-based separation process, containing at least 98% metallics and not more than 1% free zinc, to include material from the following suppliers: Huron Valley, Newell, Ferrous Processing/SLC Recycling and Fort Wayne OmniSource Corp., for US Midwest delivery within 30 days. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers/processors. Price started in May 2006, replacing previous auto shreds/twitch price effective September 2006.

**US Low-grade auto shreds** – Auto shreds generated through an eddy current-based or hand separation process, containing at least 90% metallics and not more than 4% zinc, for US Midwest delivery within 30 days. Assessed twice a week, usually on Mondays and Thursdays, through a survey of secondary aluminum smelters and scrap dealers. Price started in May 2006, replacing previous auto shreds/twitch price effective September 2006.

## ANTIMONY

**MW NY Dealer** – 99.65% min. antimony ingot, 0.15% max. arsenic, warehouse, 5-ton lots, duty paid.

**99.65% HK** – Chinese produced antimony regulus, min. 99.65% Sb, \$ per mt, FOB Hong Kong.

## ARSENIC

**MW Dealer** – Free market price for arsenic metal lumps (first size), minimum 99% As, 5mt lots, in-warehouse, \$/lb. Started September 2003.

## BISMUTH

**MW NY Dealer** – Estimated NY merchant price, 99.99% min. purity, prompt delivery. Min. one ton, in-warehouse, \$/lb.

## CADMIUM

**MW NY Dealer** – Estimated NY Dealer price, 99.95% min. purity, prompt delivery. Min 5-ton lots.

**MW Free Market High Grade** – Estimated NY dealer price, 99.99% minimum purity metal, prompt delivery, minimum 5-ton lots, \$/lb. Started October 2003.

## COBALT

**Europe** – Cobalt 99.8%: Weekly estimated \$/lb price for minimum 99.8% cobalt. The price is assessed on a free market in warehouse Europe basis. Based on survey of producers, traders and consumers of cobalt. Assessed weekly, usually on Thursdays.

**MW, 99.8% US Spot Cathode** – US free market cobalt, 99.8%, Falconbridge (Xstrata Nickel) or equivalent, 1"x1" cut, electrolytic, cobalt cathodes, minimum 99.8% Co, packed in 250 kg steel drums, four drums per wooden pallet, strapped to pallet. Assessed in \$/lb, delivered, duty-paid US, delivery within 30 days, payment net-30 days. All Cuban origin material excluded from US cobalt assessments. Based on surveys of producers, merchants and consumers, assessed Thursdays or closest business day.

**MW, 99.6% Zambian** – US free market cobalt, 99.6%, Zambian, thin/broken, electrolytic cathode, minimum 99.6% Co, packed in 250 kg steel drums. Assessed in \$/lb, delivered, duty-paid US, delivery within 30 days, payment net-30 days.

Based on surveys of producers, merchants and consumers. Assessed Thursdays or closest business day.

**MW, 99.3% Russian** – US free market cobalt, 99.3%, Russian K1A/K1Ay electrolytic ingot/granules, minimum 99.30% Co and 99.35% Co, K1A and K1Ay respectively, ingot sizes 370x110x60 mm or 270x150x50 mm for K1A, typical ingot weight 12-14 kg, or granules 5-50 mm for K1Ay, certified suitable for use in aerospace, packed in 250 kg steel drums, or packed in metal containers up to 4,500 kg net. Basis delivered, duty-paid, US, delivery within 30 days, payment net-30 days. Note: Russian K1 (99.25% Co) and K2 (98.30% Co) excluded from this assessment. Based on surveys of producers, merchants and consumers. Assessed on Thursdays or closest business day.

## COPPER

**COMEX** – Settlement prices on New York Mercantile Exchange's COMEX division. Forward positions are indicated by footnote (C) on price pages. The high-grade contract is ASTM B115.

**LME** – Official morning session prices on London Metal Exchange. First price is bid, second is asked. Weekly average is the bid/asked mean. The grade A contract is 99.9935% Cu and only cathode and wirebar shapes are deliverable. Quoted as ¢/mt until June 30, 1993. Started quote in \$/mt as of July 1, 1993.

**MW No. 1 Scrap** – Mid-week transaction based, buy-side indications for US-delivered bare bright scrap and burnt wire, expressed as a ¢s/lb discount spread to the First Position COMEX price.

**MW No. 2 Scrap** – Estimated New York area delivered price for US-delivered clean No. 2 scrap (96% Cu) for the next to last business day of the week expressed as a ¢s/lb discount spread to the First Position COMEX price.

**(DISCONTINUED) MW CIF Europe** – LME grade A asked price.

**(DISCONTINUED) MW Composite** – Weighted average based on estimated US refined copper production, on a delivered cathode basis.

**NY Dealer Premium/Cathode** – Typical premiums expressed in ¢s/lb above First Position COMEX being charged by New York metal merchants on the next to last business day of the week.

**(DISCONTINUED) MW US Producer Cathode** – Weighted average based on estimated US refined copper production and published prices for delivered full-plate cathodes.

**(DISCONTINUED) MW US Producer/Refinery** – f.o.b. quotation is MW US producer/delivered prices less 1.4¢s shipping cost.

**(DISCONTINUED) US Producer Cathodes and US Producer Wirebars** – Official list prices for those grades (99.9% Cu).

**Europe** – Grade A CIF Rotterdam: Weekly estimated \$/mt premium for Grade A LME copper on a CIF Rotterdam basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of copper. Assessed weekly, usually on Wednesdays.



**Europe** – Grade A CIF Italy: Weekly estimated \$/mt premium for Grade A LME copper on a CIF Italian port basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of copper. Assessed weekly, usually on Wednesdays.

**Europe** – Standard CIF Rotterdam: Weekly estimated \$/mt premium for Russian standard grade copper on a CIF Rotterdam basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of copper. Assessed weekly, usually on Wednesdays.

**Copper Concentrate** – Cu 30%, CIF Japan. Daily estimated treatment and refining charges (\$/mt; cts/lb) for 25-30% copper-in-concentrate, any origin, lumpy ore, 0-30 day terms, Cargo leaves port in month following that of transaction.

**Copper C&F China** – Daily estimated premium for Grade A 99.95% minimum cathode, mostly of Chilean origin, over LME cash for C&F China copper business. Cargo leaves port upon receipt of letter of credits, usually within one month following the transaction. Delivered to main Chinese ports such as Huangpu, Shanghai, Guangzhou, and Hong Kong. (Under consideration to be changed to a CIF basis price)

**In-Warehouse Singapore Premium** – Daily estimated premium for Grade A 99.95% minimum material of all origin, mainly Philippines, Indonesia, Chilean, South Korean, and Australian, Chinese, and Japanese, in-warehouse Singapore. Cargo released immediately upon payment.

## FERROCHROME

**65% 6-8% High Carbon DDP NWE:** Weekly assessment for 60-70% chrome, normalized to 65% Cr, with Si content of 1.5%; P content 0.030%. The specification is for volumes of 200-500 mt, delivered, duty-paid Northwest Europe, basis for delivery within four weeks from date of transaction, net-30 days payment terms. Assessment will be in \$/lb Cr contained and conducted on Thursdays (or closest business day in the case of holidays) through a survey of producers, traders and steel mill buyers. Started July 8, 1992.

**65% High-Carbon, in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 60-65% Cr, high-carbon ferrochrome, normalized to 65% Cr, 6-8% carbon, 2% max silicon, 0.03% max phosphorous, 0.04% max sulfur, lumps size 0.50 x 2.5 inch; US origin and imported material, free market, cents/lb Cr contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction; net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for quantities of four truckloads and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time. Started December 15, 1971.

**High-carbon 58-60% CIF China:** Weekly price assessment of the repeatable, tradeable spot price for 58-60% Cr high-carbon ferrochrome, with a maximum silicon content of 5%, maximum 8% carbon, 0.04% max phosphorous, 0.05% max

sulfur, in lumps, lump size 10-150 mm, all origins. The assessment will reflect a typical order quantity of a minimum 500 mt, delivered CIF main Chinese ports within 60 days from date of transaction, payment terms cash against documents or payment terms letter of credit at sight, packed in 1 mt big bags, or in bulk, and/or in ocean-going, customs-sealed containers at point of export. Assessment made Fridays (or closest business day in the case of holidays), from a survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, reflecting the narrow low-high price range of the majority of spot deals, bids and offers on a cents/lb Cr contained basis.

**Low Carbon 0.15% in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 0.15% carbon, 68-74% Cr, ferrochrome, carbon 0.15% max, silicon 1% max, phosphorous 0.3% max, sulfur 0.02% max, lumps size 0.50 x 2.5 inch; US origin and imported material, free market; cents/lb Cr contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for full truckload quantities and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time. Started October 4, 1995.

**Low-Carbon 0.10% DDP NWE:** Weekly assessment for 60-70% chrome, normalized to an assessed grade with a Si content of 0.05% and P content 0.05%. The specification will be for volumes of 200-500 mt, delivered, duty-paid Northwest Europe basis for delivery within 4 weeks from date of transaction, net-30 days payment terms. Assessment will be in \$/lbCr contained and conducted on Thursdays (or the closest business day in the case of holidays) through a survey of producers, traders and steel mill buyers. Started July 8, 1992.

**Low Carbon 0.10% in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 0.10% carbon, 65-74% Cr, ferrochrome, normalized to 68% Cr, carbon 0.10% max, silicon 1% max, phosphorous 0.3% max, sulfur 0.02% max, lumps size 0.50 x 2.5 inch. The assessment covers US origin and imported material, free market, cents/lb Cr contained, in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland; Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for full-truckload quantities and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time. Started September 1, 1992.

**Low Carbon 0.05% in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 0.05% carbon, 65-74% chrome, normalized to 68% Cr, carbon 0.05% max, silicon 1% max, phosphorous 0.3% max, sulfur 0.02% max; lumps 0.50 x 2.5 inch; US-origin and imported material, free market; cents/lb Cr contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key

locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for full-truckload quantities and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time. Started January 3, 1973.

**Charge Chrome 52% DDP NWE:** Weekly assessment for 48-52% grades normalized to a Si content of maximum 6-8% and P content 0.030%. The specification will be for volumes of 200-500 mt, delivered, duty-paid Northwest Europe basis, for delivery within 4 weeks from date of transaction, net-30 days payment. Assessment will be in \$/lb Cr contained and conducted on Thursdays (or the closest business day in the case of holidays) through a survey of producers, traders and steel mill buyers. Started July 8, 1992.

**Charge Chrome 48-52% Cr, in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 48-52%Cr charge chrome, carbon 8% max, silicon 4% max, phosphorous 0.03% max, sulfur 0.04% max, lumps size 1 x 2.5 inch; US origin and imported material, free market, cents/lb Cr contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction; net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for quantities of four truckloads and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time. Started March 16, 1977.

**Charge Chrome 48-52% CIF China:** Weekly assessment of the repeatable, tradeable spot price for charge chrome CIF main Chinese ports, with chrome content of 48-52%, normalized to a maximum 9% carbon, max 0.05% sulfur, max 0.04% phosphorus and max 6% silicon, lump size 10-100 mm, all origins. The assessment will reflect a typical order quantity of minimum 500 mt, delivered CIF China within 90 days from the date of transaction, cash against documents or payment terms letter of credit at sight, packed in 1 mt big bags, or in bulk, and/or in ocean-going, customs-sealed containers at point of export. Assessment made Fridays (or closest business day in the case of holidays), from a survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, reflecting the narrow low-high price range of the majority of spot deals, bids and offers on a cents/lb Cr contained basis.

**NSSC Charge Chrome 50-55% Quarterly CIF Japan:** Quarterly price as published by Nippon Steel & Sumikin Stainless Steel Corporation, for 50-55% Cr, 6-9% C. Started July 1, 1993.

**High-carbon 60-65% CIF Japan:** Weekly assessment of the repeatable, tradeable spot price for 60-65% high-carbon ferrochrome, with silicon content of 2-4%, maximum 8% carbon, 0.02-0.05% phosphorous, 0.05% max sulfur, lump size 10-100 mm, all origins. The assessment will reflect a typical order quantity of a minimum

200 mt, loading from the port of origins for shipping to Japan within 60 days from the date of transaction, CIF main Japanese port basis, payment cash against documents, or payment terms letter of credit at sight. Packed in 1 mt big bags, or in bulk, and/or in ocean-going, customs-sealed containers at point of export. Assessment to be made Fridays (or closest business day in the case of holidays), from a survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, reflecting the narrow low-high price range of the majority of spot deals, bids and offers on a cents/lb Cr contained basis.

## FERROMANGANESE

**High-Carbon 76% Mn in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for high-carbon ferromanganese 74-78% Mn, normalized to 76% Mn, carbon 7.5% max, silicon 1.2%, phosphorous 0.5%, sulfur 0.02%; lumps 0.5- x 4.00 inch; US-origin and imported material, \$/long ton Mn contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The specification will be for a minimum of four truckload quantities and greater. The assessment will reflect pricing for minimum quantities of four truckloads and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time.

**High-Carbon 75% HK – 75% Mn,** US dollar per mt, f.o.b. main Chinese ports.

**Medium Carbon 85% Mn in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for medium-carbon ferromanganese 80-85% Mn, carbon 1.5% max, silicon 1.5% max, phosphorous 0.40% max, sulfur 0.2%; lumps size 0.50 x 2.5 inch; US-origin and imported material; cents/lb Mn contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will be for minimum quantities of four truckloads and greater. Assessment made Wednesdays, or closest business day, from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time.

## FERROMOLYBDENUM

Prices based on moly content.

**US Free Market ferromoly –** weekly spot sales, 60% min Mo, 0.5% Cu, delivered, \$ per lb/Mo, minimum 2,400 lb lot.

**Europe – Ferromoly:** Free market weekly estimated \$/kg price for ferromolybdenum 70% Mo, 0.5% Cu, on a cash Rotterdam inwarehouse, duty paid basis. Standardized



lump 2" or less, truck load lots. Based on a survey of producers, traders and consumers of ferromoly. Assessed in Europe on Thursdays.

**Ferromolybdenum 60% FOB China (MMAFP00)** – Weekly assessment of the repeatable, tradable spot price ferromolybdenum exported from Chinese ports for 60-65% molybdenum contained, normalized to 60% molybdenum, maximum 0.1% carbon, maximum 1.5% silicon, maximum 0.06% phosphorous, maximum 0.1% sulfur, and maximum 0.5% copper; packed in drums 100 kg/250 kg) or bags (1 mt/bag), normalized to 1mt bags; FOB Chinese ports; payment cash against documents or LC at site. Deliveries to customers within one month after the date of purchase agreement. Standard volume will be a container, or 20 mt. Assessed in dollars per kilogram, in a narrow price range reflecting the majority of business. Assessment made weekly on Thursdays or closest business day from a survey of producers, traders and consumers.

**(DISCONTINUED) 60-70% Prod/Japan** – 0.1% C, 2% Si, Mo content per kilo, Japanese producer. Discontinued June 30, 1993.

**Ferromolybdenum 60% CIF Japan (MMAFM00)** – Weekly assessment of the repeatable, tradable spot price ferromolybdenum imported into Japan, with 60-65% molybdenum and normalized to 60% molybdenum, maximum 0.1% carbon, maximum 2.0% silicon, maximum 0.06% phosphorous, maximum 0.1% sulfur, and maximum 0.5% copper; packed in 1mt big bags, 25-kg paper boxes, steel drums or other packaging, normalized to 1 mt big bags; CIF main port Japan; payment cash against documents or LC at site, loading less than 60 days after the date of transaction. Minimum volume 18 mt per transaction. Assessed in dollars per kilogram in a narrow price range that reflects the majority of business. Assessment made Thursdays or closest business day from survey of producers, traders and end-users in steel and other metal sectors.

## FERROSILICON

**75% Std DDP NWE:** Weekly assessment for 75% ferrosilicon; grades will be normalized to a specification with Al content of 1.5%, S 0.02% and P 0.04%. The assessment will be for volumes of 200-800 mt, delivered, duty-paid Northwest Europe basis for delivery within four weeks, net-30 days payment terms. Assessment will be in \$/lb Si contained and conducted on Thursdays (or the closest business day in the case of holidays) through a survey of producers, traders and steel mill buyers.

**75% Si, in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 73-79% Si, normalized to 75% Si, aluminum 0.5% min-1.5% max, calcium 1.5% max; carbon 0.10% max, lumps 2x0.50 inch, 2x1 inch, or 4x1 inch; US-origin and imported material; in cents/lb Si contained; in-bulk or 2,000-3,000 lb supersacks; duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California, and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis will be normalized to an in-warehouse basis. Fines normalized to stated lump specifications. The assessment will be for a minimum of four truckload quantities and greater. Special packaging and payment terms normalized to meet stated specifications. Assessment made Wednesdays or closest business day from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time.

**Chinese CIF Japan (Si 75% min, 0.2% C max.)** – Started July 1, 1993.

**Ferrosilicon 75% FOB China (MMAKB00)** – Weekly assessment of the repeatable, tradable, spot price for Chinese-origin ferrosilicon with 73-79% silicon, normalized to 75% Si; maximum 1.5% aluminum, maximum 0.02% sulfur, maximum 0.04% phosphorous, maximum 0.2% carbon; lumps 10-50 mm; FOB main Chinese sea ports, packed in 1 mt big bags loaded on oceangoing vessel or packed in seagoing 20-foot (18-24-mt) containers and customs sealed, export tariff-paid, within 30 days of date of transaction. Assessment is made in dollars per metric ton reflecting the narrow range where the majority of business is occurring. Payment by telegraphic transfer, cash against documents, irrevocable letter of credit drawn against approved bank at site or equivalent. Assessment quantities are 18 mt and greater. Assessment made Thursdays or closest business day from a survey of producers, traders and consumers.

**(DISCONTINUED) Regular CIF Japan, Spot CIF Japan. Discontinued as of December 31, 2007:** Regular CIF Japan, Spot CIF Japan)

**(DISCONTINUED) Non-Origin yen/mt delivered (120-day usance)** – Started July 1, 1993. Discontinued December 31, 2007

## FERROVANADIUM

**US Free Market Ferrovandium** – weekly spot sales; 80% minimum V content, \$/lb/V; 2% max Si, 2% max Al, delivered.

**US Free Market V205, (vanadium pentoxide)** – weekly spot sales/indications; 98% minimum, delivered, price per lb/V205.

**Europe- 70-80% V Ferrovandium:** Free market weekly estimated \$/kg price for ferrovandium 70-80% V, on an inwarehouse Eurpoe basis. Based on a survey of producers, traders and consumers of ferrovandium. Assessed in Europe on Thursdays.

**(DISCONTINUED) 80% Prod/Japan** – 80% V, V content ferrovandium, Japanese producer, and imported, yen per kilo. Discontinued June 30, 1993.

## GOLD

**COMEX** – Settlement prices on the New York Mercantile Exchange's COMEX Division. Forward position is indicated by footnote (C) on price pages. These months are spot and one year out.

**Handy & Harman** – Daily quotation is the lowest price at which offers can be obtained by Handy & Harman for gold, min 99.95% purity, for nearby delivery in New York in quantities sufficient to meet its daily requirements.

**London Final and London Initial** – These spot quotations are established twice daily by consensus of major London bullion dealers. Purity: 99.5% fine.

**Engelhard Unfab** – base price per tr oz, asked price at 10:30 EST for 99.99% purity, unfabricated, f.o.b. Carteret, NJ, vault.

## INDIUM

**US Producer Indium Corp.** – Indium Corp.'s price for 99.97% purity metal; 1 kilo bar in lots of 10,000 tr oz, f.o.b., Utica, NY, published in \$/kg.

**MW NY Dealer Indium** – Price is based on 99.99% minimum purity indium at warehouse (Rotterdam), CIF, in minimum lots of 50kg.

**Indium 99.99% CIF Japan:** Indium metal with 99.99% purity, primary or secondary, measured in \$/kg, shipped to Japan, delivery within 30 days. The metal should be compliant to European Union's RoHS directive, which restricts content of cadmium to less than 75 ppm, lead to less than 100 ppm, mercury to less than 100 ppm and hexavalent chromium to less than 20 ppm in 1 kilogram of the metal. 99.993% and 99.995% purity metal prices are to be considered as references. Platts assesses materials of Chinese and South Korean origins. Platts reserves the right to omit materials of unspecified origins from the assessment. Lots are 50 kg minimum and should not exceed 5 mt. Lots less than 50 kg are not to be considered as they are likely to be priced higher, and lots over 5 mt are likely to be sold with a volume discount. Platts assesses prices of the metal exported to Japan to be sold to Japanese traders, indium tin oxide manufacturers, solder and electronics equipment makers, as well as solar battery material makers. Spot prices are assessed on a weekly basis every Tuesday or closest working day based on a survey of Chinese producers, traders, South Korean producers and traders, Japanese traders, Japanese ITO makers and solder/electronics and battery makers.

## IRIDIUM

**MW NY Dealer** – f.o.b. New York spot, estimated market price for min. 99% Ir purity.

## LEAD

**LME** – Official morning session prices on the London Metal Exchange. First price is bid, second is asked. Weekly average is the bid/asked mean. Purity 99.97%. Quoted as ¢/mt until June 30, 1993. Started quote in \$/mt on July 1, 1993.

**(DISCONTINUED) MW NA Producer (MW NA Prod)** – The weighted average, based on 1993 production figures, of the list prices of those NA (Canadian and US) primary and secondary producers still quoting list prices, in addition to those producers who have switched to LME pricing, the LME cash price plus appropriate market premiums or discounts.

**(DISCONTINUED) MW North American Secondary Price (Lead Sec Prod)** – The weighted average of the prices of NA (US and Canadian) secondary producers.

**US Lead Premium:** US premium to the LME settlement price for 99.97% pure corroding-grade lead, in 2,000-lb blocks (sows) or 55-100 lb pigs (ingots), maximum 0.025% bismuth, max 0.0050% silver, max 0.0010% Cu, max 0.001 Fe, delivered US within 30 days, normalized to a delivered Midwest basis, net-30 days payment terms. Minimum quantity one truckload (42,000-44,000 lb), typical order size one to five truckloads. Assessed weekly on Tuesday or closest business day in the event of holidays, through a survey of primary and secondary lead producers, traders and consumers of refined lead.

North American Lead Market Price: Daily formula assessment reflecting the current day's LME lead cash settlement price in cents per pound plus the weekly US premium. (See separate entry).

**US Used Lead-Acid Batteries** – Weekly assessment for 50% lead-acid, starter-lighter ignition automotive batteries, picked up US Midwest, assessed in cents/lb, suitable for delivery to secondary smelters within 30 days, net-30 days payment terms. Minimum quantity one truckload (42,000-44,000 lb), with typical order size one to five truckloads, packaged in shrink-wrapped pallets or skids, pallet size 40" or 44" by 48", maximum 3,600 lb per skid, no more than three battery layers separated by cardboard sheets. Assessed weekly through a survey of secondary lead smelter buyers, scrap dealers/processors, traders and brokers. Input from scrap yards will also be considered for trend purposes. The lead prices will be assessed weekly on Tuesdays (or closest business day in the event of holidays).

**Europe** – Dealer Premium 99.990% Rotterdam: Weekly estimated \$/mt premium over LME cash for 99.990% lead on an in-warehouse Rotterdam basis, duty paid. Based on a survey of producers, traders and consumers of lead. Assessed every other week, usually on Tuesdays.

**Europe** – 99.985% Rotterdam: Weekly estimated \$/mt premium over LME cash for 99.985% lead on an in-warehouse Rotterdam basis, duty paid. Based on a survey of producers, traders and consumers of lead. Assessed every other week, usually on Tuesdays.

**Europe** – 99.970% Rotterdam: Weekly estimated \$/mt premium over LME cash for 99.970% lead on an inwarehouse Rotterdam basis, duty paid. Based on a survey of producers, traders and consumers of lead. Assessed every other week, usually on Tuesdays.

**In-Warehouse Singapore Premium** – Daily estimated premium for 99.97% material of mainly Chinese origin, in-warehouse Singapore. Cargo released immediately upon payment.

## MAGNESIUM

All prices for 40,000-lb (truckload) lots.

**(DISCONTINUED) US Die Cast Alloy/Producer** – US producer list price, AZ91D alloy ingot, delivered. Under consideration for discontinuation due to producers' failure to update. Discontinued December 31, 2007

**(DISCONTINUED) US Primary Ingot/Producer** – US producer list price, 99.8% Mg, ASTM Grade 9980A, net 30 days financing, delivered, duty paid. Under consideration for discontinuation due to producers' failure to update. Discontinued December 31, 2007

**US Die Cast Alloy/Tran** – Western AZ91D alloy ingot, 40,000-lb (truckload), net 30 days, delivered, duty paid, reflecting the majority of producer/customer transactions on a spot basis. Started July 1, 1993.

**MW US Spot Western** – Western-origin pure 99.8% Mg ingot, ASTM Grade 9980A, truckload (40,000 lb) lots, net 30 days, duty paid, prompt delivery to US customer plant (Al alloying, chemical, and Mg ferrosilicon segments). Started July 1, 1993.

**MW US Dealer Import** – Non-oxidized, pure 99.8-99.9% Mg ingot, primarily from CIS or China, truckload (40,000 lb) lots, net 30 days, duty paid, prompt delivery to US customer plant (Al alloying, chemical, and Mg ferrosilicon segments). Started July 1, 1993.

**European Free Market** – Dealer price, 99.9% pure Russian or Ukrainian origin, mostly unoxidized Mg, in warehouse Rotterdam, duty unpaid.

**99.8% FOB China:** Weekly spot assessment range for 99.8% minimum pure magnesium ingots from China, in \$/mt, FOB Tianjin, for shipment within 30 days. The assessment is based on a survey of China-based and Western traders, Chinese producers, Western consumers and analysts, assessed weekly on Tuesday or closest working day.

**Magnesium Diecast Alloy FOB China** – Magnesium diecast alloy, to include AZ91D, AM50 and AM60 specifications qualified by automotive companies, FOB Tianjin port destined for export within 30 days. Assessed from Hong Kong or Singapore in dollars per metric ton on a weekly basis, on Tuesday or closest business day, through a survey of Chinese producers, Asian traders and worldwide diecasters buying on an FOB China basis. Prices which are reported on a delivered China or CIF basis to other countries will be normalized to meet the specification. Includes export tax.

## MANGANESE

**Electrolytic Manganese 99.7% Mn FOB China:** Weekly assessment of the repeatable, tradeable, spot price for 99.7-99.9% Mn; flakes, size 10mm x 150mm x 1.5 mm, normalized to 99.7%; silicon 0.05%, sulfur 0.04%, carbon 0.04%, iron 0.03%, phosphorous 0.004%, lead 0.001%; Chinese-origin and imported material, free market, \$/mt, packaging in 250 kg drums, in Customs-sealed, 20 ft containers, export duty paid; shipment loading within 30 days from date of transaction, payment cash against documents, including original bill of lading. Reported CIF and CFR transactions normalized back to FOB China specification, using prevailing freight rates. Special packaging and payment terms normalized back to stated specification. Assessment made Thursdays, or closest business day, from survey of producers, traders and consumers of electrolytic manganese metal flake.

## MANGANESE ORE

Platts launched on January 3, 2012, a daily spot market price assessment of **manganese ore**.

**Price Assessment:** Platts publishes the daily spot market price for manganese ore, reflecting the price at which a cargo could be traded on a CIF North China basis, Tianjin, at the close of the assessment period on the day of publishing. These assessed values are based on confirmed spot cargo transactions, or the tradable price falling between firm cargo bids/offers, or in the absence of liquidity, where spot market transactions would have been concluded for the benchmark grade.

Spot price bids/offers or trades basis FOB or CIF in other locations may be netted back to CIF North China using prevailing spot freight rates for dry bulk carriers on the day of assessment. For netback/netforward calculations, the appropriate vessel class freight costs are taken into consideration.

Platts spot market price assessment can also take into account fundamentals of demand/supply of manganese ore and alloys in key consumer and producer markets internationally.

**Availability:** The daily spot price assessment of manganese ore is published in Platts' real-time service Platts Metals Alert (PMA), in Platts Metals Week, and in Platts Metals Daily supplements. Monthly averages are published on PMA, in Platts Metals Week Price Notification Monthly Report and in Metals Week.

**Frequency:** The assessment CIF China is published daily and reflects market values prevailing at the close of Asian markets, typically at 6:30 pm Singapore time (1030 GMT). The assessment is published following editorial engagement with market participants such as producers, consumers, traders, shippers and other active spot market participants.

**Basis & Location:** Cargoes offered Cost, Insurance and Freight (CIF) Tianjin North China are the basis for delivery, with delivery to other Chinese ports normalized to Tianjin.

**Unit:** All prices are quoted in US dollars per dry contained manganese unit (\$/dmtu).

**Timing:** Platts assesses cargoes arriving CIF North China typically from 2 – 8 weeks forward from the date of publication and will normalize to the middle of the delivery window.

**Quality:** The assessment reflects high grade manganese ore lumps normalized to a standard specification of 44% Mn contained content. All values deemed typical; specifications with Mn content ranging from 41% to 46% are to be normalized to a standard where Fe content is 6.00%, SiO<sub>2</sub> is 8.00%, Al<sub>2</sub>O<sub>3</sub> is 7.00% P is 0.11%, moisture is 3.00% and sizing at 5mm to 80mm, 90% passing.

Quality inspections are typically made at discharge port. Re-assessments of quality at delivered ports will not be considered for assessment of spot prices based on the principle that the original transaction was executed in good faith.

**Volume:** Minimum cargoes of 5,000 mt or one full hatch are assessed as standard.

**Payment terms:** Cash or at sight terms are standard for assessment all deviations will be normalized to this standard.

## MERCURY

**(DISCONTINUED) D.F. Goldsmith** – Price quoted by D.F. Goldsmith for 99.995% purity mercury in 76lb flasks, 99.99%. Price was implemented on June 1, 1992. Discontinued in 1998.

**Free Market International** – Price based on 99.99% minimum purity HG, Prime Virgin, CIF Rotterdam, \$/fl.

**US Domestic** – Price based on 99.99% minimum purity Hg, Prime Virgin, FOB US East Coast warehouse, in minimum quantity of 50fl, \$/fl.

## MOLYBDENUM

**Daily Dealer Oxide (MMAYQ00)** – Platts launched a daily Molybdenum Oxide assessment on October 10, 2011. The assessment is for “repeatable” dealer-to-consumer, producer-to-consumer, producer-to-dealer and/or dealer-to-dealer spot sales, technical-grade moly oxide (roasted molybdenum concentrates), min 57% Mo, max 0.5% Cu, 0.05% lead, drummed material, order quantities 18-24 metric tons for delivery 3-30 days forward from the date of publication, CIF Japan, in-warehouse European ports, delivered US, delivered duty-unpaid South Korean ports and CIF Nhava Sheva/Mumbai, India. Reported sales of powdered material packed in big bags or cans, and of oxide briquettes, are normalized to an equivalent price for powdered material in drums. The daily assessment takes into account all transactions, bids and offers reported to Platts in the 24-hour period up to 4:30 pm London time each day, except on the last business day of the calendar month, when the cut-off point for transactions to be included is 1:00 pm London time. The price is assessed as a range in US dollars per pound, reflecting the narrow price band where the majority of transactions took place or, in the absence of business, where most typical buyers and sellers would be likely to conclude a deal. The Daily Dealer Oxide price assessment is published in Platts’ real-time service Platts Metals Alert (PMA) on page PMA398, in Platts Metals Daily and in the Platts Metals Week supplement. Weekly and monthly averages of the high, low and mean of the daily assessment ranges are published on PMA and in Platts Metals Daily on the last business day of the week and the month, respectively, after close of business US East Coast time. Platts publishes weekly volume figures to show total tonnage by region for concluded deals accounted for in the assessment. Before January 3, 2012, the assessment only reflected dealer-to-consumer sales, CIF Japan, in-warehouse European ports and delivered US.

**MW Dealer Oxide (MMAGQ00)** – A weekly assessment for “repeatable” dealer-to-consumer, producer-to-consumer, producer-to-dealer and/or dealer-to-dealer spot sales, technical-grade moly oxide (roasted molybdenum concentrates), min 57% Mo, max 0.5% Cu, 0.05% lead, drummed material, order quantities 18-24 metric tons for delivery 3-30 days forward from the date of publication, CIF Japan, in-warehouse European ports, delivered US, delivered duty-unpaid South Korean ports and CIF Nhava Sheva/Mumbai, India. Price history begins in April 1971. Before January 3, 2012, the assessment only reflected dealer-to-consumer sales, CIF Japan, in-warehouse European ports and delivered US. Consolidated with the Daily Dealer Oxide assessment effective January 2, 2013, when the methodology changed to become the weekly average of the Daily Dealer Oxide assessment.

**MW Oxide Transaction** – A weekly assessment for “repeatable” dealer-to-consumer, producer-to-consumer, producer-to-dealer and/or dealer-to-dealer spot sales, technical-grade moly oxide (roasted molybdenum concentrates), min 57% Mo, max 0.5% Cu, 0.05% lead, drummed material, order quantities 18-24 metric tons for delivery 3-30 days forward from the date of publication, CIF Japan, in-warehouse European ports, delivered US, delivered duty-unpaid South Korean ports and CIF Nhava Sheva/Mumbai, India. Molybdenum is assessed every week on Thursdays or closest prior business day. Discontinued July 2, 2012.

**(DISCONTINUED) Moly oxide CIF Japan** – Moly Oxide min. 57% grade — Platts assesses weekly spot prices for molybdenum oxide (roasted molybdenum concentrates) of minimum 57% molybdenum, maximum 0.5% copper, and maximum 0.05% lead, with a chemistry composition of MoS<sub>3</sub>, exported to Japan on a CIF basis. Assessments are for moly oxide in powder form, drummed or sold in big bags, for delivery to Japanese ports. Prices for moly oxide briquettes are normalized to the price of powder, with Platts taking into consideration typical processing

charges. Minimum tonnage of transactions to be considered for the assessment is 18 mt. Units for assessment are US dollar per pound. Discontinued May 1, 2013.

**(DISCONTINUED) Moly oxide FOB China** – Chinese Origin — Platts assesses weekly spot prices for molybdenum oxide (roasted molybdenum concentrates) of minimum 57% molybdenum, maximum 0.5% copper, and maximum 0.05% lead, with a chemistry composition of MoS<sub>3</sub>, exported from China on an FOB basis. Assessments are for moly oxide in powder form, drummed or sold in big bags, for delivery from Chinese ports. Prices for moly oxide briquettes are normalized to the price of powder, with Platts taking into consideration typical processing charges. Minimum tonnage of transactions to be considered for the assessment is 18 mt. Units for assessment are US dollar per pound. Discontinued May 1, 2013.

## NICKEL

**N American Free Market** – 4X4 cathode, estimated weekly market price in US and Canada; 99.9% Ni, delivered.

**N American Free Market** – melting grade; estimated weekly market price in US and Canada; briquettes, cathode, disc/pellets; 99.9% Ni, delivered.

**N American Free Market** – plating grade; estimated weekly market price in US and Canada; 99.95% Ni, various forms, delivered.

**LME** – Official morning session prices on the London Metal Exchange for the cash, three-month, and 15-month positions. First price is bid, second is asked. Weekly average is bid/asked mean. Meets LME specifications, duty unpaid in approved LME warehouses.

**(DISCONTINUED) MW LME Mean** – The average of the cash and three months, bid and ask positions calculated on a daily basis.

**Europe — Cut Cathode:** A weekly assessment for the spot premium over LME cash for nickel 4x4 inch cut cathodes, LME grade minimum 99.8% nickel, on an in-warehouse Rotterdam basis. The premium is assessed on US dollar per metric tonne basis. The assessment is based on a survey of producers, traders and consumers of nickel. Nickel cut cathode is assessed every week on Fridays or closest prior business day.

**Europe — Briquettes:** A weekly assessment for the spot premium over LME cash for nickel briquettes, LME grade minimum 99.8% nickel, on an in-warehouse Rotterdam basis. The premium is assessed on US dollar per metric tonne basis. The assessment is based on a survey of producers, traders and consumers of nickel. Nickel briquettes are assessed every week on Fridays or closest prior business day.

**Europe — Russian Full Plate:** A weekly assessment for the spot over LME cash for Russian Full Plate uncut cathode, LME grade minimum 99.8% nickel, on an in-warehouse Rotterdam basis. The premium is assessed on US dollar per metric tonne basis. The assessment is based on a survey of producers, traders and consumers of nickel. Russian full plate is assessed every week on Fridays or closest prior business day.

**In-Warehouse Singapore Premium** – Daily estimated premium for 99.8% minimum material of mainly Brazilian and Russian origin, in-warehouse Singapore. Cargo sold in the form of squares, full plates, or briquettes. Cargo released immediately upon payment.

## OSMIUM

**MW New York Dealer** – f.o.b. New York, spot, estimated market price, min 99.5% purity osmium.

## PALLADIUM

**New York Mercantile Exchange** – 99.95% purity palladium in 100-oz lots. Settlement prices on the New York Mercantile Exchange for the nearest active delivery month. These months are January, April, July and October.

**MW New York Dealer** – Estimated market price for 99.95% purity spot metal, f.o.b. New York.

**JM Base Asia, JM Base Europe, JM Base NA** – Quoted by Johnson Matthey to customers for 99.95% purity palladium, f.o.b. JM refinery.

**Hong Kong spot at 0700 GMT** – These spot quotations are established daily at 0700 GMT, based on current trading levels quoted by Johnson Matthey. Purity: 99.95% purity.

**Engelhard Unfab** – base per tr oz asked price at 10:30 EST for 99.95% purity, unfabricated, f.o.b. Carteret, NJ, vault.

**London AM Fix** – Based on Good Delivery metal of 99.95% purity in the form of plate or ingot with a minimum weight of 1 kg and maximum of 6 kg.

**London PM Fix** – Based on Good Delivery metal of 99.95% purity in the form of plate or ingot with a minimum weight of 1 kg and maximum of 6 kg.

## PLATINUM

**New York Mercantile Exchange** – 99.95% purity platinum in 50-oz lots. Settlement prices on the New York Mercantile Exchange for the nearest active delivery month. These months are January, April, July, and October.

**MW New York Dealer** – Estimated market price for spot 99.95% purity metal, f.o.b. New York.

**JM Base Asia, JM Base Europe, JM Base NA** – Quoted by Johnson Matthey to customers for 99.95% purity platinum, f.o.b. JM refinery.

**Hong Kong spot at 0700 GMT** – These spot quotations are established daily at 0700 GMT, based on current trading levels quoted by Johnson Matthey. Purity: 99.95% purity.

**Engelhard Unfab** – base price per tr oz, asked price at 10:30 EST for 99.95% purity, unfabricated, f.o.b. Carteret, NJ, vault.

**London AM Fix** – Based on Good Delivery metal of 99.95% purity in the form of plate or ingot with a minimum weight of 1 kg and maximum of 6 kg.

**London PM Fix** – Based on Good Delivery metal of 99.95% purity in the form of plate or ingot with a minimum weight of 1 kg and maximum of 6 kg.

## RHENIUM

**MW NY Dealer** – Free market price based on 69.4% Re contained (ammonium perrhenate), delivered to US customer works, quoted in \$/kg, basis shipment and payment within 30 days. Based on a weekly survey of merchants, producers and consumers. Assessed Thursdays or closest business day.

## RHODIUM

**MW New York Dealer** – f.o.b. New York, spot, estimated market price for 99.9% purity.

JM Base Asia, JM Base Europe, JM Base NA – Quoted by Johnson Matthey to customers for 99.9% purity Rh, f.o.b. JM refinery.

**Engelhard Unfab** – base price per tr. oz. asked price at 10:30 EST for 99.9% purity, unfabricated, f.o.b. Carteret, NJ, vault.

## RUTHENIUM

**MW New York Dealer** – f.o.b. New York, spot, estimated market price for 99.9% purity metal.

**JM Base NA** – Quoted by Johnson Matthey to customers for 99.9% purity Ru, f.o.b. JM refinery.

**Engelhard Unfab** – base price per tr.oz. asked price at 10:30 EST for 99.9% purity, unfabricated, f.o.b. Carteret, NJ, vault.

## SELENIUM

**MW New York Dealer** – Selenium metal powder, minus 200 mesh, min. Se 99.5% in warehouse, 5-ton lots. Assessed in \$/lb, basis shipment and payment within 30 days. Assessed on Thursdays or closest business day based on a survey of merchants and producers.

## SILICOMANGANESE

**65:16 DDP NWE:** Weekly assessment for grades will be normalized to a specification with P content 0.25% and C content 1.5%. The assessment will be for volumes of 300-1,000 mt delivered, duty-paid Northwest Europe basis for delivery within four weeks. Assessment will be in Eur/mt Mn contained and conducted on Thursdays (or the closest business day in the case of holidays) through a survey of producers, traders and steel mill buyers.

**65% Mn, in-warehouse US:** Weekly assessment of the repeatable, tradeable, spot price for 65-72% Mn, normalized to 65% Mn, silicon 16-18%, carbon 2% max, phosphorous 0.35% max, sulfur 0.04% max; lumps size 2.5x0.50 inch; in-bulk or 2,000-3,000 lb supersacks; US-origin and imported material; cents/lb Mn contained, duty-paid in-warehouse in key locations along the Mississippi, Chicago, Ohio and Columbia River systems and other key port warehousing locations, including Baltimore, Maryland, Long Beach, California,



and Portland, Oregon; delivery within 60 days from date of transaction, net-30 days payment terms from date of delivery. Transactions reported on a delivered basis normalized to an in-warehouse basis. Fines normalized to stated lump specifications. Special packaging and payment terms normalized to meet stated specifications. The assessment will reflect pricing for minimum quantities of four truckloads and greater. Assessment made Wednesdays or closest business day from survey of producers, traders and end users in the carbon, stainless and specialty steel sectors, closing at 4pm New York time.

**60-70%/Japan** – 60-70% silicomanganese, 16-20% Si imported, ( ) per mt. HK 65% Mn – min 65% Mn. max 17% Si, US dollar per kilo, f.o.b. main Chinese ports. Discontinued June 30, 1993.

**Chinese CIF Japan** – (Mn 65% min, Si 16% min). Started July 1, 1993.

**(DISCONTINUED) Regular CIF Japan** – (S Africa, Norway, Brazil) \$/mt (Mn 65% min, Si 16% min). Started July 1, 1993. Discontinued December 31, 2007.

**(DISCONTINUED): CIS CIF Japan.** Discontinued as of December 31, 2007.

**(DISCONTINUED) Non-Origin** – yen/mt delivered (120-day usance). Started July 1, 1993. Discontinued December 31, 2007.

## SILICON

**Silicon 553 Grade, Delivered US Midwest:** Weekly assessment of the repeatable, tradeable, spot price for US and imported 553 grade silicon metal with minimum 98.50% silicon; maximum 0.50% iron; maximum 0.30% calcium and 0.2-0.5% aluminum; lumps size 4 inches; cents/lb, in bulk or 2,000-3,000 lb supersacks, duty-paid, delivered Midwest, delivery within 30 days from date of transaction; net-30 days payment terms from date of delivery. Reported in-warehouse, or picked-up, transactions normalized to delivered US Midwest. Fines normalized to stated lump specifications. Special packaging and payment terms to be normalized to meet stated specifications. Assessment quantities are three truckloads and upward. Smaller quantities to be normalized to stated quantity. Assessment made Wednesdays or closest business day, based on a survey of producers, traders and consumers, closing at 4pm New York time. Assessment started October 22, 1975.

**Silicon, 553 grade, in-warehouse EU:** Weekly assessment of the repeatable, tradeable, spot price for EU origin and imported 553 grade silicon metal with minimum 98.50% silicon; maximum 0.50% iron; maximum 0.30% calcium and 0.2-0.5% aluminum; lumps size 50-100 mm; euros/mt, in bulk/1 mt big bags in-warehouse, duty-paid, EU main ports, producer plants and major EU warehousing hubs; delivery within 60 days from date of transaction; net-30 days payment terms from date of delivery. Reported delivered transactions normalized back to in-warehouse basis. Special packaging and payment terms to be normalized to meet stated specifications. Transaction quantities are three truckloads and greater. Smaller quantities to be normalized to stated quantity. Assessment made Thursdays or closest business day from a survey of producers, traders and consumers. Assessment started March 7, 2002.

**Silicon 553 grade, FOB China:** Weekly assessment of the repeatable, tradeable, spot price for Chinese origin and imported 553 grade silicon metal with minimum 98.50% silicon; maximum 0.50% iron; maximum 0.30% calcium and 0.2-0.5% aluminum; lumps size 50-100 mm; \$/mt, FOB main Chinese sea ports, in bulk/1

mt big bags loaded on oceangoing vessel or packed in seagoing 20ft or 40 ft containers and customs sealed, export tariff-paid, within 30 days of date of transaction. Payment by telegraphic transfer, cash against documents, including original bill of lading and irrevocable letter of credit drawn against approved bank at site or equivalent. Assessment quantities are 20 mt and greater, with smaller volumes normalized to stated quantity. Special packaging and payment terms to be normalized to meet stated specifications. Assessment made Thursdays or closest business day from a survey of producers, traders and consumers. Assessment started June 27, 1991.

**Silicon 553 grade, CIF Japan:** Weekly assessment of the repeatable, tradeable, spot price for any origin silicon metal with minimum 98.50% silicon; maximum 0.50% iron; maximum 0.30% calcium and 0.2-0.5% aluminum; lumps size 50-100 mm; \$/mt, CIF main Japan sea ports, loaded in bulk or 1 mt big bags on oceangoing vessel or packed in seagoing 20ft or 40 ft containers and customs sealed at point of origin. Payment by telegraphic transfer, cash against documents, including original bill of lading and irrevocable letter of credit drawn against approved bank at site or equivalent. Assessment quantities are 20 mt and greater, with smaller volumes normalized to stated quantity. Assessment made Thursdays or closest business day from a survey of producers, traders and consumers. Assessment started July 1, 1993.

## SILVER

**COMEX** – Settlement prices on the New York Mercantile Exchange's COMEX division. Forward positions are indicated by footnote (C) on price pages. These months are spot, three months out, and one year out.

**Handy & Harman** – Lowest price at which offers can be obtained by Handy & Harman for silver in commercial bar form, in accordance with ASTM designation B413-69. Specification for refined silver, grade 99.9%, for nearby delivery at New York, in quantities sufficient to meet its daily requirements.

**London Fix** – This fix is established at 12:05 London time by consensus of major silver dealers.

**London Spot/US Equivalent** – Official US dollar equivalent of London Spot price as quoted by major London bullion dealers.

**Engelhard Unfab** – base price per tr oz asked price at 12:30 EST for 99.9% purity, unfabricated, f.o.b. Carteret, NJ, vault.

**Hong Kong spot at 0700 GMT** – These spot quotations are established daily at 0700 GMT, based on current trading levels quoted by Johnson Matthey. Purity: 99.9% purity.

## STAINLESS SCRAP

**North American Free Market 18-8** – weekly spot sales, \$/long ton gross weight; 7-9% Ni, 17% min chrome, delivered plant, minimum quantity 1,000st.

## TANTALUM

**Spot Tantalite Ore** – US import, dealer quote, \$/lb, price based on Ta2O5 content.

## TIN

**LME** – Official morning session prices on the London Metal Exchange. First price is bid, second is asked. Weekly average is the bid/asked mean. Purity 99.85%.

**(DISCONTINUED) MW Composite** – the price is calculated using an average of the KLTM price and the LME price, plus fixed charges, finance charges, Malaysian exchange rate, and a risk factor representing the cost to US consumers for Grade A tin, ex-dock, major port, duty paid.

**MW New York Dealer** – New York Grade A tin quotation by major dealers for spot material. Duty paid, ex-dock. Prices usually set Monday and Thursday.

**(DISCONTINUED) MW New York low lead tin** – New York low lead tin (i.e. 50 ppm lead content max) quotation by major dealers for spot material. Duty paid, ex-dock, for delivery within 30 days. Prices usually set Monday and Thursday. Price is in cents/lb.

**Europe – 99.85% Malay origin:** Weekly estimated \$/mt premium for Malay origin 99.85% tin on a CIF Rotterdam basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of tin. Assessed weekly, usually on Wednesdays.

**Europe – 99.9% Chinese origin:** Weekly estimated \$/mt premium for Chinese origin 99.9% tin on a CIF Rotterdam basis, 0-30-day terms, prompt delivery. Based on a survey of producers, traders and consumers of tin. Assessed weekly, usually on Wednesdays.

**KLTM** – Daily settlement price for Straits tin (min 99.85% purity) on the Kuala Lumpur Tin Market, Malaysia, converted into US cents per lb, using the spot Citibank Malaysian exchange rate.

## TITANIUM

**MW US 70% Ferrotitanium** – Estimated spot market price for 70% Ti ferrotitanium, lump form, max. 5% Al, 2-3% V, 0.5% tin, duty paid, delivered, per lb of Ti contained.

**European 70% Ferrotitanium** – Spot market transaction price for European standard grade 70% Ti ferrotitanium, max. 5% Al, 2-3% V, 0.5% tin, max. 0.5% N, duty paid, delivered, per kg Ti contained.

**MW US Turning 0.5%** – Free market price for US unprocessed turnings, 90% Ti, 6% Al, 4% V, 0.5% tin, delivered, duty paid.

**European Turning 0.5%** – Spot price for US- or European-generated turnings, 90% Ti, 6% Al, 4% V, 0.5% tin, delivered, duty paid.

## TUNGSTEN

**MW US Free Market Tungsten Ore Import** – weekly estimate of market price; Min 65% WO<sub>3</sub>, price based on stu of WO<sub>3</sub>,

**APT US** – weekly estimate of market price; min 88.5% WO<sub>3</sub>, \$/stu, delivered.

**MW US Free Market Ferrotungsten** – weekly estimate of market price; min 75% W, max 0.5% Cu, \$/lb W, delivered.

**APT European** – Min 88.5% WO<sub>3</sub>, US dollar per mtu, c.i.f. Rotterdam, cash, duty free.

**APT-HK** – Chinese #1 grade, min, 88.5% WO<sub>3</sub>, US dollar per mtu, f.o.b. main Chinese ports.

**HK Ferrotungsten** – min 75% W, US dollar per kilo, f.o.b. main Chinese ports.

## ZINC

**LME SHG** – Official morning session price for 99.95% or better zinc.

**MW North American SHG (MW NA SHG)** – Price based on LME base price plus premiums or discounts, depending on market conditions.

**MW North American GAL (MW NA GAL)** – A formula-based quote aimed at zinc users in the galvanized and steel markets. Factors considered are the LME cash price plus premiums or discounts, financing by the consumer, and other market-related conditions. Varies on a daily basis.

**(DISCONTINUED) MW Four Corners** – (Formerly MPR, EPP) LME SHG cash and three-month bid and asked prices, averaged on a daily basis.

**MW Alloy No. 3** – US alloyer quote for No. 3 die casting alloy, 30,000-lb lots and over, delivered, based on LME cash price plus premiums for alloying. Varies on a daily basis.

**Europe – SHG Rotterdam:** Weekly estimated \$/mt premium over LME cash for Special High Grade zinc on an inwarehouse Rotterdam basis, 0-60-day terms, prompt delivery. Based on a survey of producers, traders and consumers of zinc. Assessed every other week, usually on Tuesdays.

**In-Warehouse Singapore Premium** – Daily estimated premium for 99.995% minimum material of mainly Chinese origin, in-warehouse Singapore. Cargo released immediately upon payment.

## FOREIGN EXCHANGE

Pound Sterling (Spot) and Three-Month Midpoint, Deutschmark, Canadian dollar, and Yen. The exchange rates as quoted by the New York Federal Reserve Bank. The Pound Sterling, Deutschmark, Canadian dollar spot, and Yen are set at noon New York time, while the Pound Sterling and Canadian Dollar Three-Month 10 AM Midpoint are set at 10 AM New York time. The Malaysian ringgit is the Citibank selling rate taken at approximately 10:15 AM New York time. The London Metal Exchange Sterling, Three-Month Sterling, LME Deutschmark and LME Yen are as quoted on LME Official morning session.

## BACKGROUND

Since January 2, 1930, Platts Metals Week (originally E&MJ Metal & Mineral Markets) has served as an independent price authority for the international nonferrous metals industry. Platts Metals Week's prices are widely used by the industry and government for evaluating pricing of metals and ores, levying taxes and tariffs, determining freight rates, and evaluating new projects.

Because of the large variety of prices and the different methods used to determine each, it is important to understand the ground rules which Platts Metals Week uses to keep the price series as consistent as possible. An overview of how the Platts Metals Week prices are gathered, computed, and averaged follows.

### Types of prices

As distinguished by frequency, Platts Metals Week publishes the following types of prices:

- Daily
- Weekly averages of dailies
- Monthly averages of dailies
- Weekly (set or quoted once a week)
- Bi-weekly (set or quoted twice a week, e.g. NY Dealer Tin)
- Monthly averages of weeklies
- Monthly mean averages of select weeklies
- Annual averages of monthly averages

These prices, according to their source or method of calculation, may be further categorized as follows (examples in parentheses):

- Producer list prices (Lead North American Secondary)
- Consumer buying prices (Silver-Handy & Harman)
- Platts Metals Week canvas of dealers, producers, and consumers (Molybdenum-MW Dealer Oxide)
- Platts Metals Week weighted averages calculated using confidential prices and tonnages (Lead-MW NA Producer)
- Platts Metals Week weighted averages calculated using published prices and estimated tonnages (Copper-MW Composite)
- Prices computed by a formula (Tin-MW Composite)
- Consensus prices set by specialized groups (Gold-London Final)
- Quoted prices on metal and commodity exchanges (Zinc-LME SHG Cash)
- Prices converted from other currencies and units (Copper-MW c.i.f. Europe)

Exclusive Platts Metals Week quotations are usually preceded by MW in the price description. Weekly averages of the quoted prices on the London Metal Exchange, the New York Mercantile Exchange's NYMEX/COMEX divisions also are published in Platts Metals Week.

Price descriptions usually refer to the source of the price, although they may also include references to the form or purity of the metal as well as to quantity and delivery information.

### Effective dates

The fact that there are many types of prices makes it necessary to use three dating conventions: 1) the producer list price effective date, 2) the day the market was last surveyed, and 3) the day a price last changed.

Producer prices usually carry effective dates. When more than one producer is involved, the date is the last time a producer price change affected the price published in Platts Metals Week.

The day the market was last surveyed is usually the next-to-last business day of the week. Most dealer prices and others that change frequently are dated in this manner.

The day a price last changed is used for prices which do not have effective dates and which may change infrequently. It is also occasionally used with certain inactive dealer prices.

### Foreign exchange rates

Four daily foreign exchange rates are published by Platts: the British pound sterling (both spot and three-months), the Canadian dollar (both spot and three-months), the London Metal Exchange sterling (both spot and three-months), the LME European Euro and the Japanese yen. The British (spot), Canadian (spot) and Japanese exchange rates are the official noon buying rates as quoted by the New York Federal Reserve Bank. These rates are averaged to six decimal places on a weekly, monthly and annual basis.

The British pound sterling spot exchange rate is used to convert Platts Metals Week weekly prices into pounds sterling on a weekly basis and to convert several London prices into US dollars on a daily basis. When an exchange rate is not available (because of a US holiday which does not apply in London, for example) the previous day's exchange rate is used. This procedure minimizes fluctuations in the converted price. The Malaysian dollar exchange rate is used to convert Malaysian tin prices into US dollars and to calculate the MW Composite tin price.

### Price ranges

A weekly price may be quoted as a range to reflect either divergent pricing by competing producers and dealers or a week's dealer business. The bottom end of the range is used for calculating the monthlies in all cases except where the price is listed as a MEAN price.

The double prices quoted on the London Metal Exchange are daily bid and asked prices. The arithmetic means of these are used to calculate weekly and monthly averages.

### High/low prices

Most of the "High" and "Low" price listings which appear on the monthly and annual price pages of Metals Week apply to the quoted daily prices. Exceptions to this rule are: 1) for weekly prices, the high/low quotes are determined by the bottom of the weekly range if one exists; 2) for London Metal Exchange prices, the high/low applies to the daily bid/asked quotation; and 3) for monthly LME settlement prices (which are monthly averages of the applicable daily LME cash asked price), the high/low is the applicable monthly LME Settlement price.



### Futures trading positions

The New York Mercantile Exchange's NYMEX/COMEX divisions quote constantly changing futures positions on several metals. Platts Metals Week has selected convenient positions and reduced them to numerical designations (1st positions, 2nd position, etc.). The actual trading months quoted are footnoted each week in Platts Metals Week. The nearest (spot), three months, and approximate twelve months from spot positions are generally quoted.

When trading months shift in the middle of a week, the quoted prices reflect the new trading month applicable to the numerical position designation.

### Calculation of averages

There are three types of Platts Metals Week averages: 1) those derived from daily prices, 2) those derived from weekly prices, and 3) those derived from monthly prices.

1) All prices quoted on a daily basis are arithmetically averaged to create weekly and monthly averages in the currency and units in which the prices originate. For bid and ask prices, the mean of the bid and ask price is used for the calculation, holidays, and other no-quote situations are excluded from the calculation.

2) In calculating monthly averages, prices quoted only on a weekly basis are considered to represent the full business week (beginning Monday) and therefore are weighted according to the number of business days in that week for which the New York Federal Reserve Bank published an exchange rate.

For example, the monthly averages for March 1993 were based on four weeks with five business days and one week with three business days; the price quoted for each week is weighted by the number of business days in that week, and the total is divided by the number of business days in the month – in this case 21.

Monthly averages of weekly prices in most cases use the low end of a price range, if one exists. The exceptions to this rule are prices that are listed as mean. The mean price is an average of the low and high end of a range. Platts Metals Week reserves the right to drop a low quote at any time it becomes unrepresentative of the market.

Because monthly averages must be available to industry on the first day of the following month, a discrepancy can result in the monthly average for prices set weekly when the month ends early in a given week. In such an instance, when a month ends on Monday, Tuesday, or Wednesday, the previous week's price applies to those days. If the month ends on Thursday or Friday, that week's price applies to the entire week. (In particularly volatile markets, Platts Metals Week may set a given week's price earlier than usual to assure that the resulting monthly average more accurately reflects the market.) Weekly prices are intended to apply to the week as a whole, and producer effective dates are not taken into consideration in calculating monthly averages. This is done to minimize the problem of having arbitrarily to determine which of several producer effective dates should be applied.

3) Annual averages are arithmetic averages of monthly quotations in the currency and units in which the price originates.

### Conversion into other currencies

The way a price is converted from one currency and measure of weight into another depends on whether the price is a daily, weekly, or monthly one. (see page 13 for a description of the different types of prices.)

1) Prices which originate as weekly quotations are converted into other currencies using the applicable exchange rates for the next to last business day of the week (usually Thursday). Monthly averages of weekly prices are converted into other currencies by using the published average monthly exchange rates, which reflect the New York Federal Reserve Bank business day schedule.

2) Weekly and monthly averages of daily prices are converted using an average of the daily exchange rates as they apply to each individual price. Because of differing holiday schedules from one country or industry to another, a number of different (unpublished) average exchange rates may be used to convert weekly and monthly averages of daily prices into other currencies. For any month in which there are no holidays, the published weekly and monthly average exchange rates are used to convert the daily prices into other currencies.

3) Annual averages are converted into other currencies using arithmetic averages of the published monthly exchange rates. It should be noted that only annual averages stated in the originating currency are true averages. The conversion of these averages into other currencies is accomplished using a single average annual exchanges rate. As a result, that conversion will not exactly agree with an annual average (which one might calculate for oneself) of monthly averages which are not stated in the originating currency. The same is true of monthly averages of prices which originate as weekly prices.

### Conversion tables

To convert a price from a per-unit basis to a per-ton-of-ore basis, multiply the unit price by the percentage of unit-based material in the ore. For example, if 50% manganese ore were priced at \$1.00 per long ton unit, the price per long ton of ore would be \$50.00

### GLOSSARY OF TERMS

ABMS	American Bureau of Metal Statistics
Ag	Silver
AK	Alaska
AL	aluminum
A1203	alumina, or aluminum oxide
ally	alloy
APT	ammonium paratungstate
AR	Arkansas
Ar	argon
As	arsenic
Atl	Atlantic
Au	gold
AZ	Arizona

B	Boron	FeSi	ferrosilicon
backwardation	A situation in which the cash (nearby) price of a commodity is higher than the futures price.	FL	Florida
Be	beryllium	fl	Flask. A unit of measure for mercury, equal to 76 lb.
Bi	bismuth	foundry	foundry
BOM	Bureau of Mines	f.o.b.	Free on board. Consignment to customer with all prior charges onto customer's conveyance, usually ship, railcar, or truck.
BPA	Bonneville Power Administration	force majeure	act of God
C	carbon	FTC	(US)Federal Trade Commission
(C)	Comex footnote	GA	Georgia
CA	California	GAO	(US) General Accounting Office
Ca	calcium	Ge	germanium
carb	carbon	gm	gram
cath	cathode	GOB	good ordinary brand [European prime western-grade zinc]
Cb2O5	columbium pentoxide, not the mineral columbite	H	hydrogen
CBOT	Chicago Board of Trade	He	helium
Cd	cadmium	Hf	hafnium
CFTC	(US) Commodity Futures Trading Commission	HG	high grade [copper, tin, and zinc]
c.i.f.	cost, insurance, and freight paid by shipper	Hg	mercury
CIPEC	Conseil Intergouvernemental des Pays Exportateurs de Cuivre (Intergovernmental Council of Copper-Exporting Countries). The copper exporters' organization, formed in 1967, headquartered in Paris whose principal members are Chile, Peru, Zaire, and Zambia.	HI	Hawaii
Cl	chlorine	hi	high
CO	Colorado	IA	Iowa
Co	cobalt	IBA	International Bauxite Association. The bauxite producers' group, formed in March 1974 and headquartered in Kingston, Jamaica.
Comex	The COMEX division of the New York Mercantile Exchange. A hedge market on which gold and silver are traded.	ID	Idaho
conc	concentrates	IL	Illinois
contango	A situation in which the futures price of a commodity is higher than the cash (nearby) price.	ILZSG	International Lead and Zinc Study Group
Cr	chromium	IMF	International Monetary Fund
Cr2O3	chromite	IMM	International Monetary Market. Also known as the Chicago Mercantile Exchange.
CT	Connecticut	impt	imported
Cu	copper	IN	Indiana
DC	District of Columbia	In	indium
DE	Delaware	ingt	ingot
del	delivered	Ir	iridium
DLA	Defense Logistics Agency, responsible for US government stockpile metal sales, acquisitions, and upgrading.	IRS	(US) Internal Revenue Service
DM	German Deutschmark	ITA	International Trade Administration
electrltc	electrolytic	ITC	(US) International Trade Commission
EPA	(US)Environmental Protection Agency	K	potassium
eqv	equivalent	kg	kilogram
F	fluorine	KLCE	Kuala Lumpur Commodity Exchange
f.a.s.	free alongside ship	KLTM	Kuala Lumpur Tin Market
Fe	iron	KS	Kansas
ferromoly	ferromolybdenum	kW	kilowatt
		kWh	kilowatt-hour
		KY	Kentucky
		œ	British pound sterling
		LA	Louisiana

lb	pound	ND	North Dakota
Li	lithium	NE	Nebraska
LIA	Lead Industries Association	NH	New Hampshire
lo	low	Ni	nickel
lt	long ton or gross ton (2,240 lb).	NJ	New Jersey
ltpy	long tons per year	NM	New Mexico
ltu	long ton unit	NUM	(South Africa)National Union of Mineworkers
(M)	New York Mercantile Exchange footnote	NV	Nevada
MA	Massachusetts	NY	New York
maj	major	NYMEX	New York Mercantile Exchange
mast	master	O	oxygen
max	maximum	official session	The morning session of the London Metal Exchange
MD	Maryland	OH	Ohio
ME	Maine	OK	Oklahoma
mean	averaged high and low price	OPIC	Overseas Private Investment Corp. Authorized by the US government to provide expropriation insurance for private corporations operating outside the US.
med	medium	OR	Oregon
Merc Ex	New York Mercantile Exchange	Os	osmium
mesh	The number of wires per linear inch of a screen. Used for fine sizing.	OSHA	Occupational Safety and Health Administration
Mg	magnesium	P	phosphorous
MI	Michigan	p	British pence
micro	One-millionth of a meter. Used for fine sizing.	PA	Pennsylvania
min	minimum	Pb	lead
MITI	Ministry of International Trade and Industry, a Japanese government body	Pd	palladium
MN	Minnesota	pellt	pellet
Mn	manganese	pos	position
MO	Missouri	prem	premium
Mo	molybdenum	primary production	The process of producing metal from its ore, as distinct from secondary production from scrap metal.
MS	Mississippi	prod	producer
MT	Montana	Pt	platinum
mt	metric ton (2,204.62 lb)	PW	prime western [zinc]
mtl	metal	Rb	rubidium
mtpd	metric tons per day	Re	rhenium
mtpm	metric tons per month	ref	refinery
mtpy	metric tons per year	refinery	In copper and lead, a plant which further purifies metal produced in a smelter. In zinc, a plant which produces purer metal than could be produced in a smelter. In aluminum, a plant which refines bauxite into alumina.
mtu	metric ton unit	Rh	rhodium
MW	Megawatt. A unit of power equal to one-million watts. Often used in describing the capacity of a power plant; e.g., "a 300-MW hydroelectric plant."	RI	Rhode Island
MW	Metals Week or Mid West	ring dealer	A member of the London Metal Exchange allowed to trade metal in the ring
N	nitrogen	Ru	ruthenium
NA	North America	S	sulfur
NA	not available	Sb	antimony
Na	sodium	SC	South Carolina
Nb	niobium		
NC	North Carolina		

SD	South Dakota	TVA	Tennessee Valley Authority
Se	selenium	TX	Texas
settlement price	The last price at which a commodity is traded in a particular session.	U	Uranium
SG	standard grade	UAW	United Auto Workers
SHG	special high grade	UNCTAD	United Nations Conference on Trade and Development
Si	silicon	unfab	unfabricated
smelter	In copper, lead, and zinc, a plant which reduces concentrate to metal. In aluminum, a plant which upgrades alumina into metal.	USBM	United States Bureau of Mines
Sn	tin	USTR	United States Trade Representative
Sr	strontium	USW	(US) United Steelworkers Union
stu	short ton unit	UT	Utah
Ta	tantalum	V	vanadium
Ta2O5	tantalum pentoxide, not the mineral tantalite	V2O5	vanadium pentoxide
Te	tellurium	VA	Virginia
thr-mo	three-month	VT	Vermont
TiO2	titanium dioxide, a paint base	W	tungsten
TN	Tennessee	WA	Washington
ton	short ton (2,000 lb)	WI	Wisconsin
tpm	short tons per month	W03	tungsten trioxide, common designation for tungsten content
tpy	short tons per year	WV	West Virginia
tr oz	troy ounce	WY	Wyoming
		Y	yttrium
		Zn	zinc