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## ***ARGUS METALS INTERNATIONAL***

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The most up-to-date Argus Metals International methodology is available on [www.argusmedia.com](http://www.argusmedia.com)

## Methodology overview

### Methodology rationale

Argus strives to construct methodologies that reflect the way the market trades. Argus aims to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, the specific currencies, volume units, locations and other particulars of an assessment are determined by industry conventions.

In the base metals, minor metals, ferro-alloys and rare earths markets, Argus publishes physical market prices in the open market as laid out in the specifications and methodology guide. Argus uses the trading period deemed by Argus to be most appropriate, in consultation with industry, to capture market liquidity.

In order to be included in the assessment process, deals must meet the minimum volume, delivery, timing and specification requirements in our methodology. In illiquid markets, and in other cases where deemed appropriate, Argus assesses the range within which product could have traded by applying a strict process outlined later in this methodology.

### Survey process

Argus price assessments are informed by information received from a wide cross section of market participants, including producers, consumers and intermediaries. Argus reporters engage with the industry by proactively polling participants for market data. Argus will contact and accept market data from all credible market sources including front and back office of market participants and brokers. Argus will also receive market data from electronic trading platforms and directly from the back offices of market participants. Argus will accept market data by telephone, instant messenger, email or other means.

Argus encourages all sources of market data to submit all market data to which they are a party that falls within the Argus stated methodological criteria for the relevant assessment. Argus encourages all sources of market data to submit transaction data from back office functions.

Throughout all markets, Argus is constantly seeking to increase the number of companies willing to provide market data. Reporters are mentored and held accountable for expanding their pool of contacts. The number of entities providing market data can vary significantly from day to day based on market conditions.

For certain price assessments identified by local management, if more than 50pc of the market data involved in arriving at a price assessment is sourced from a single party the supervising editor will engage in an analysis of the market data with the primary reporter to ensure that the quality and integrity of the assessment has not been affected.

### Market data usage

In each market, Argus uses the methodological approach deemed to be the most reliable and representative for that market. Argus will utilise various types of market data in its methodologies, to include:

- Transactions
- Bids and offers

- Other market information, to include spread values between grades, locations, timings, and many other data.

In many markets, the relevant methodology will assign a relatively higher importance to transactions over bids and offers, and a relatively higher importance to bids and offers over other market information. Certain markets however will exist for which such a hierarchy would produce unreliable and non-representative price assessments, and so the methodology must assign a different relative importance in order to ensure the quality and integrity of the price assessment. And even in markets for which the hierarchy normally applies, certain market situations will at times emerge for which the strict hierarchy would produce non-representative prices, requiring Argus to adapt in order to publish representative prices.

### Verification of transaction data

Reporters carefully analyse all data submitted to the price assessment process. These data include transactions, bids, offers, volumes, counterparties, specifications and any other information that contributes materially to the determination of price. This high level of care described applies regardless of the methodology employed. Specific to transactions, bids, and offers, reporters seek to verify the price, the volume, the specifications, location basis, and counterparty. In some transactional average methodologies, reporters also examine the full array of transactions to match counterparties and arrive at a list of unique transactions. In some transactional average methodologies, full details of the transactions verified are published electronically and are accessible by subscribers. The deals are also published in the daily report.

Several tests are applied by reporters in all markets to transactional data to determine if it should be subjected to further scrutiny. If a transaction has been identified as failing such a test, it will receive further scrutiny. For assessments used to settle derivatives and for many other assessments, Argus has established internal procedures that involve escalation of inquiry within the source's company and escalating review within Argus management. Should this process determine that a transaction should be excluded from the price assessment process, the supervising editor will initiate approval and, if necessary, documentation procedures.

### Primary tests applied by reporters

- Transactions not transacted at arm's length, including deals between related parties or affiliates.
- Transaction prices that deviate significantly from the mean of all transactions submitted for that day.
- Transaction prices that fall outside of the generally observed lows and highs that operated throughout the trading day.
- Transactions that are suspected to be a leg of another transaction or in some way contingent on an unknown transaction.
- Single deal volumes that significantly exceed the typical transaction volume for that market.
- Transaction details that are identified by other market participants as being for any reason potentially anomalous and perceived by Argus to be as such.
- Transaction details that are reported by one counterparty differently than the other counterparty.

- Any transaction details that appear to the reporter to be illogical or to stray from the norms of trading behaviour. This could include but is not limited to divergent specifications, unusual delivery location and counterparties not typically seen.
- Transactions that involve the same counterparties, the same price and delivery dates are checked to see that they are separate deals and not one deal duplicated in Argus records.

### Secondary tests applied by editors for transactions identified for further scrutiny

#### Transaction tests

- The impact of linkage of the deal to possible other transactions such as contingent legs, exchanges, options, swaps, or other derivative instruments. This will include a review of transactions in markets that the reporter may not be covering.
- The nature of disagreement between counterparties on transactional details.
- The possibility that a deal is directly linked to an offsetting transaction that is not publicly known, for example a “wash trade” which has the purpose of influencing the published price.
- The impact of non-market factors on price or volume, including distressed delivery, credit issues, scheduling issues, demurrage, or containment.

#### Source tests

- The credibility of the explanation provided for the outlying nature of the transaction.
- The track record of the source. Sources will be deemed more credible if they
  - Regularly provide transaction data with few errors.
  - Provide data by Argus’ established deadline.
  - Quickly respond to queries from Argus reporters.
  - Have staff designated to respond to such queries.
- How close the information receipt is to the deadline for information, and the impact of that proximity on the validation process.

### Assessment guidelines

When insufficient, inadequate, or no transaction information exists, or when Argus concludes that a transaction based methodology will not produce representative prices, Argus reporters will make an assessment of market value by applying intelligent judgement based on a broad array of factual market information. Reporters must use a high degree of care in gathering and validating all market data used in determining price assessments, a degree of care equal to that applying to gathering and validating transactions. The information used to form an assessment could include deals done, bids, offers, tenders, spread trades, exchange trades, fundamental supply and demand information and other inputs.

The assessment process employing judgement is rigorous, replicable, and uses widely accepted valuation metrics. These valuation metrics mirror the process used by physical commodity traders to internally assess value prior to entering the market with a bid or offer. Applying these valuation metrics along with sound judgement significantly narrows the band within which a commodity can be assessed, and greatly increases the accuracy and consistency of the

price series. The application of judgement is conducted jointly with the supervising editor, in order to be sure that guidelines below are being followed. Valuation metrics include the following:

#### Relative value transactions

Frequently transactions occur which instead of being an outright purchase or sale of a single commodity, are instead exchanges of commodities. Such transactions allow reporters to value less liquid markets against more liquid ones and establish a strong basis for the exercise of judgment.

- Exchange one commodity for a different commodity in the same market at a negotiated value.
- Exchange delivery dates for the same commodity at a negotiated value.
- Exchange a commodity in one location for the same commodity at another location at a negotiated value.

#### Bids and offers

If a sufficient number of bids and offers populate the market, then in most cases the highest bid and the lowest offer can be assumed to define the boundaries between which a deal could be transacted.

#### Comparative metrics

- The relative values between compared commodities are readily discussed in the market and can be discovered through dialogue with market participants. These discussions are the precursor to negotiation and conclusion of transactions.
- Comparison to the same commodity in another market centre.
- Comparison to a more actively traded but slightly different specification commodity in the same market centre.
- Comparison to the same commodity traded for a different delivery timing.
- Comparison to the commodity’s primary feedstock or primary derived product(s).
- Comparison to trade in the same commodity but in a different modality (as in barge versus oceangoing vessel) or in a different total volume (as in full cargo load versus partial cargo load).

#### Volume minimums and transaction data thresholds

Argus typically does not establish thresholds strictly on the basis of a count of transactions, as this could lead to unreliable and non-representative assessments and because of the varying transportation infrastructure found in all commodity markets. Instead, minimum volumes are typically established which may apply to each transaction accepted, to the aggregate of transactions, to transactions which set a low or high assessment or to other volumetrically relevant parameters.

For price assessments used to settle derivatives, Argus will seek to establish minimum transaction data thresholds and when no such threshold can be established Argus will explain the reasons. These thresholds will often reflect the minimum volumes necessary to produce a transaction-based methodology, but may also establish minimum deal parameters for use by a methodology that is based primarily on judgement.

Should no transaction threshold exist, or should submitted data fall below this methodology's stated transaction data threshold for any reason, Argus will follow the procedures outlined elsewhere in this document regarding the exercise of judgement in the price assessment process.

### Transparency

Argus values transparency in energy markets. As a result, where available, we publish lists of deals in our reports that include price, basis, counterparty and volume information. The deal tables allow subscribers to cross check and verify the deals against the prices. Argus feels transparency and openness is vital to developing confidence in the price assessment process.

### Swaps and forwards markets

Argus publishes forward assessments for numerous markets. These include forward market contracts that can allow physical delivery and swaps contracts that swap a fixed price for the average of a floating published price. Argus looks at forward swaps to inform physical assessments but places primary emphasis on the physical markets.

### Publications and price data

Argus base metals, minor metals, ferro-alloys and rare earths prices are published in the Argus Metals International report. Subsets of these prices appear in other Argus market reports and newsletters in various forms. The price data are available independent of the text-based report in electronic files that can feed into various databases. These price data are also supplied through various third-party data integrators. The Argus website also provides access to prices, reports and news with various web-based tools. All Argus prices are kept in a historical database and available for purchase. Contact your local Argus office for information.

A publication schedule is available at [www.argusmedia.com](http://www.argusmedia.com)

### Corrections to assessments

Argus will on occasion publish corrections to price assessments after the publication date. We will correct errors that arise from clerical mistakes, calculation errors, or a misapplication of our stated methodology. Argus will not retroactively assess markets based on new information learned after the assessments are published. We make our best effort to assess markets based on the information we gather during the trading day assessed.

### Ethics and compliance

Argus operates according to the best practices in the publishing field, and maintains thorough compliance procedures throughout the firm. We want to be seen as a preferred provider by our subscribers, who are held to equally high standards, while at the same time maintaining our editorial integrity and independence. Argus has a strict ethics policy that applies to all staff. The policy can be found on our website at [www.argusmedia.com](http://www.argusmedia.com). Included in this policy are restrictions against staff trading in any energy commodity or energy related stocks, and guidelines for accepting gifts. Argus also has strict policies regarding central archiving of email and instant messenger communication, maintenance and archiving of notes, and archiving of spreadsheets and deal lists used in the price assessment process. Argus publishes prices that report and reflect prevailing levels

for open-market arms length transactions (please see the [Argus Global Compliance Policy](#) for a detailed definition of arms length).

### Consistency in the assessment process

Argus recognises the need to have judgement consistently applied by reporters covering separate markets, and by reporters replacing existing reporters in the assessment process. In order to ensure this consistency, Argus has developed a programme of training and oversight of reporters. This programme includes:

- A global price reporting manual describing among other things the guidelines for the exercise of judgement
- Cross-training of staff between markets to ensure proper holiday and sick leave backup. Editors that float between markets to monitor staff application of best practices
- Experienced editors overseeing reporting teams are involved in daily mentoring and assisting in the application of judgement for illiquid markets
- Editors are required to sign-off on all price assessments each day, thus ensuring the consistent application of judgement.

### Review of methodology

The overriding objective of any methodology is to produce price assessments which are reliable and representative indicators of commodity market values and are free from distortion. As a result, Argus editors and reporters are regularly examining our methodologies and are in regular dialogue with the industry in order to ensure that the methodologies are representative of the market being assessed. This process is integral with reporting on a given market. In addition to this ongoing review of methodology, Argus conducts reviews of all of its methodologies and methodology documents on at least an annual basis.

Argus market report editors and management will periodically and as merited initiate reviews of market coverage based on a qualitative analysis that includes measurements of liquidity, visibility of market data, consistency of market data, quality of market data and industry usage of the assessments. Report editors will review:

- Appropriateness of the methodology of existing assessments
- Termination of existing assessments
- Initiation of new assessments.

The report editor will initiate an informal process to examine viability. This process includes:

- Informal discussions with market participants
- Informal discussions with other stakeholders
- Internal review of market data

Should changes, terminations, or initiations be merited, the report editor will submit an internal proposal to management for review and approval. Should changes or terminations of existing assessments be approved, then formal procedures for external consultation are begun.

### Changes to methodology

Formal proposals to change methodologies typically emerge out of the ongoing process of internal and external review of the meth-

odologies. Formal procedures for external consultation regarding material changes to existing methodologies will be initiated with an announcement of the proposed change published in the relevant Argus report. This announcement will include:

- Details on the proposed change and the rationale
- Method for submitting comments with a deadline for submissions
- For prices used in derivatives, notice that all formal comments will be published after the given consultation period unless submitter requests confidentiality.

Argus will provide sufficient opportunity for stakeholders to analyse and comment on changes, but will not allow the time needed to follow these procedures to create a situation wherein unrepresentative or false prices are published, markets are disrupted, or market participants are put at unnecessary risk. Argus will engage with industry throughout this process in order to gain acceptance of proposed changes to methodology. Argus cannot however guarantee universal acceptance and will act for the good order of the market and ensure the continued integrity of its price assessments as an overriding objective.

Following the consultation period, Argus management will commence an internal review and decide on the methodology change. This will be followed by an announcement of the decision, which will be published in the relevant Argus report and include a date for implementation. For prices used in derivatives, publication of stakeholders' formal comments that are not subject to confidentiality and Argus' response to those comments will also take place.

## Market overview

### Argus Metals International

Argus Metals International provides price assessments for the global markets in base metals, minor metals, ferro-alloys and rare earths.

### Average price indexes

In addition to outright prices, the service provides month-to-date and final-month average indexes.

Indexes are calculated by summing the value of published assessments and dividing by the number of assessments published in a given month. The final index value for a given month is the average calculated on the final day of assessment of that month. The report shows the evolution of the current-month index, as well as the final index value for the previous month.

### Timing and indexation

Argus Metals International contains twice-weekly, weekly and monthly assessments. Those assessments are republished in the Argus Database and available electronically for each publication date. For example, a weekly price assessed on Wednesdays will be republished on Thursday and on each subsequent publication date until the next day of assessment, in this example, the following Wednesday.

Users are advised that the published month-to-date and final indexes may differ from those calculated using Argus or third-party tools, because of this daily republication of price assessments.

### Assessment process

Price assessments are based on data and information gathered by specialist market reporters by telephone, email and instant messaging. Reporters contact a wide cross-section of market participants, including producers, consumers, marketers, traders and other intermediaries. As many participants as possible are contacted. Where relevant, Argus may also take into account information from exchanges, government agencies and trade associations.

Argus welcomes transaction data and survey input from all market participants and strongly encourage full disclosure of all relevant details of all deals concluded. All information received is crosschecked and tested against other market information. Any anomalies are excluded.

When gathering data on transactions, reporters seek to obtain the price level, volume, specifications and delivery terms. Reported trades are tested against wider market conditions and must be deemed repeatable in order to be included in the assessment. Reporters apply a series of primary and where appropriate secondary tests when verifying trades. For example, transactions which are priced significantly above or below the prevailing market may be excluded from the assessment process.

Spot transactions can vary in size between markets, and the significance of a particular spot trade to the price assessment process must be gauged in light of trade patterns in the relevant market and prevailing market conditions.

### Assessing illiquid markets

Where possible, assessments are based on verified and repeatable spot trades. In illiquid market conditions, with a lack of verified spot trades, reporters apply intelligent judgment to form assessments based on bids and offers and/or other relevant market information including a market survey of participants' view of where price levels would stand if trade were to take place.

Bids and offers must be considered repeatable for inclusion in the assessment process, and are tested against the wider market through contact with as many market participants as possible.

Additional information that may be taken into account when there are no verified spot trades during the assessment period includes:

- Bids and offers
- Market participants' view of prevailing price levels
- Verified trades in related and/or correlated markets
- Tenders
- Exchange prices
- Other relevant information including supply and demand fundamentals, and current market trends.

Reporters must use a high degree of care in gathering and validating all market data used in determining price assessments, a degree of care equal to that applying to gathering and validating transactions.

## Aluminium

### Introduction

Argus Metals International publishes price assessments and market commentary on the aluminum markets.

### Basis of assessment

Assessments are for the named material meeting the lot size, timing and delivery criteria listed in the table below. Assessments are published as a low-high range of prices that traded, or could have traded, on the day or during the period shown.

#### Notes

- International spot premiums: assessed at a differential to the LME official cash price for aluminium

- International forward/three-month premiums: assessed at a differential to the LME official cash price for aluminium on the day of shipment

### Timing of assessment

Prices are assessed and published weekly on the day specified in the table below.

For European price assessments — premiums, secondary alloy and Europe scrap assessments — market information received after 5pm London time on the day of assessment may not be included in the assessment process.

For Asia-Pacific price assessments — premiums Japan and secondary alloys Asia Pacific — market information received after

5pm Beijing time on the day of assessment may not be included in the assessment process.

For Asia scrap price assessments, market information received after 4pm Houston time on the day of assessment may not be included in the assessment process.

### Rounding

Price assessments are published to two decimal places. Price changes are shown to three decimal places

## Aluminium specifications

Assessment	Quality	Transacted/ transactable	Day of assess- ment	Min lot size	Timing	Currency/ unit	Pricing basis	Delivery
<b>Premiums - US (by truck to Indiana, Missouri, Wisconsin, Kentucky or Tennessee)</b>								
P1020 US midwest	See the <a href="#">Argus Metal Prices methodology</a>							
P1020 US midwest transaction	See the <a href="#">Argus Metal Prices methodology</a>							
6061 billet	See the <a href="#">Argus Metal Prices methodology</a>							
6063 billet	See the <a href="#">Argus Metal Prices methodology</a>							
6063 billet transaction	See the <a href="#">Argus Metal Prices methodology</a>							
<b>Premiums - Rotterdam</b>								
6063 extrusion duty paid	Aluminum Association 6063, primary billet premium	on day of assessment	Wednesday	25t	30 days	\$/t	differential	in-warehouse
P1020 duty paid 3-month	LME P1020A, 99.7% purity	on day of assessment	Wednesday	25t	3 months forward	\$/t	differential	in-warehouse
P1020 duty paid spot	LME P1020A, 99.7% purity	on day of assessment	Wednesday	25t	30 days	\$/t	differential	in-warehouse
P1020 duty unpaid 3-month	LME P1020A, 99.7% purity	on day of assessment	Wednesday	25t	3 months forward	\$/t	differential	in-warehouse
P1020 duty unpaid spot	LME P1020A, 99.7% purity	on day of assessment	Wednesday	25t	30 days	\$/t	differential	in-warehouse
<b>Premiums - Japan</b>								
P1020 duty paid spot	LME P1020A, 99.7% purity	on day of assessment	Wednesday	250t	30 days	\$/t	differential	cif Osaka, Tokyo, Norita
P1020 duty paid forward quarter	LME P1020A, 99.7% purity	on day of assessment	Wednesday	250t	3 months forward	\$/t	differential	cif Osaka, Tokyo, Norita
<b>Mill grade, extruder scrap delivered US (by truck to Indiana, Missouri, Wisconsin, Kentucky or Tennessee)</b>								
Scrap cans (UBC)	See the <a href="#">Argus Metal Prices methodology</a>							

**Aluminium specifications**

Assessment	Quality	Transacted/ transactable	Day of assessment	Min lot size	Timing	Currency/ unit	Pricing basis	Delivery
Scrap 5052 clips	See the <a href="#">Argus Metal Prices methodology</a>							
Scrap litho sheet	See the <a href="#">Argus Metal Prices methodology</a>							
MLC	See the <a href="#">Argus Metal Prices methodology</a>							
Painted siding	See the <a href="#">Argus Metal Prices methodology</a>							
6061 new bare	See the <a href="#">Argus Metal Prices methodology</a>							
6061 truck wheels	See the <a href="#">Argus Metal Prices methodology</a>							
10/10 extrusions	See the <a href="#">Argus Metal Prices methodology</a>							
A356 wheels	See the <a href="#">Argus Metal Prices methodology</a>							
6063 new bare	See the <a href="#">Argus Metal Prices methodology</a>							
EC wire	See the <a href="#">Argus Metal Prices methodology</a>							
1100 & 3003 clips	See the <a href="#">Argus Metal Prices methodology</a>							
<b>Secondary alloy - Europe</b>								
DIN 226 fob European smelter	EN 1706 46200, VAR: 226	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob Germany, Austria, Italy
DIN 230 fob European smelter	EN 1706 44100, VAR: 230	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob Germany, Austria, Italy
DIN 231 fob European smelter	EN 1706 47000, VAR: 231	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob Germany, Austria, Italy
DIN 239 fob European smelter	EN 1706 43100, VAR: 239	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob Germany, Austria, Italy
LM24 fob England smelter	BS LM24	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob England
LM25 fob England smelter	BS LM25	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob England
LM6 fob England smelter	BS LM6	on day of assessment	Monday	38,000lbs	30 days	\$/lb	outright	fob England
<b>Secondary alloy - Asia-Pacific</b>								
Aluminium-alloy Die Castings ADC12 fob China	Si 9.6-12%, Fe 1.3%max, Cu 1.5-3.5% Mg 0.3%max, Mn 0.5%max, Zn 1%max, Ni 0.5%max, Sn 0.2%max, Al: remainder. Ingot, packaged in container	since last assessment	Thursday	20t	four weeks	\$/lb	outright	fob China main ports (Ningbo, Shanghai and Tianjin port, China), duty unpaid
Aluminium-alloy Die Castings ADC12 cif Japan	Si 9.6-12%, Fe 1.3%max, Cu 1.5-3.5% Mg 0.3%max, Mn 0.5%max, Zn 1%max, Ni 0.5%max, Sn 0.2%max, Al: remainder. Ingot, packaged in container	since last assessment	Thursday	20t	four weeks	\$/lb	outright	cif Japanese main ports, duty unpaid
<b>Secondary alloy - US (by truck to Indiana, Missouri, Wisconsin, Kentucky or Tennessee)</b>								
A380.1 del US	See the <a href="#">Argus Metal Prices methodology</a>							
319.1 del US	See the <a href="#">Argus Metal Prices methodology</a>							
A356.1 del US	See the <a href="#">Argus Metal Prices methodology</a>							
A360.1 del US	See the <a href="#">Argus Metal Prices methodology</a>							
A413.1 del US	See the <a href="#">Argus Metal Prices methodology</a>							
B390 del US	See the <a href="#">Argus Metal Prices methodology</a>							

**Aluminium specifications**

Assessment	Quality	Transacted/ transactable	Day of assess- ment	Min lot size	Timing	Currency/ unit	Pricing basis	Delivery
<b>Secondary smelter scrap - US (by truck to Indiana, Missouri, Wisconsin, Kentucky or Tennessee)</b>								
MLC secondary	See the <a href="#">Argus Metal Prices methodology</a>							
1-1-3 sows	See the <a href="#">Argus Metal Prices methodology</a>							
Old cast	See the <a href="#">Argus Metal Prices methodology</a>							
Old sheet	See the <a href="#">Argus Metal Prices methodology</a>							
Painted siding	See the <a href="#">Argus Metal Prices methodology</a>							
Aluminium-copper radiators	See the <a href="#">Argus Metal Prices methodology</a>							
Mixed 2000/7000 solids	See the <a href="#">Argus Metal Prices methodology</a>							
Mixed 2000/7000 turnings	See the <a href="#">Argus Metal Prices methodology</a>							
High grade turnings	See the <a href="#">Argus Metal Prices methodology</a>							
<b>Tweak and twitch - US (by truck to Indiana, Missouri, Wisconsin, Kentucky or Tennessee)</b>								
Tweak	See the <a href="#">Argus Metal Prices methodology</a>							
Twitch	See the <a href="#">Argus Metal Prices methodology</a>							
<b>Asia scrap</b>								
Zorba cif China	ISRI Zorba	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	cif Shanghai, Ningbo, Tianjin, Dalian, Guangzhou
Taint/Tabor cif Asia port	ISRI Taint/Tabor	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
Taint/Tabor cif China	ISRI Taint/Tabor	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	cif Shanghai, Ningbo, Tianjin, Dalian, Guangzhou
Tense cif China	ISRI Tense	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	cif Shanghai, Ningbo, Tianjin, Dalian, Guangzhou
<b>Europe scrap</b>								
Taint/Tabor del European smelter	ISRI Taint/Tabor	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	delivered smelter Germany, Austria, Italy
Tense del European smelter	ISRI Tense	on day of assessment	Friday	38,000lbs	30-60 days	\$/lb	outright	delivered smelter Germany, Austria, Italy



## Copper and brass

### Introduction

Argus Metals International publishes price assessments and market commentary on the international copper markets.

### Basis of assessment

Assessments are for the named material meeting the lot size, timing and delivery criteria listed in the table below. Assessments are published as a low-high range of prices that traded, or could have traded, on the day or during the period shown.

#### Notes

- Cathode premiums and cash spreads, which are assessed as:

- US and Asia: as a differential to the Comex current month (spot) copper settlement
- Europe: as a differential to or percentage of the LME official cash price
- Next active month spread: differential to the Comex next active month contract (the nearest base contract month that is not the current delivery month).
- Brass cash spread: the price of the copper component only, expressed as a differential to Comex current month (spot) settlement

### Timing of assessment

Prices are assessed and published weekly, on Tuesday. For most assessments, market information received after 4pm Houston time on the day of assessment may not be included in the assess-

ment process.

For European price assessments — copper cathode premiums and copper scrap delivered Europe — market information received after 5pm London time on the day of assessment may not be included in the assessment process.

### Rounding

Price assessments are published to two decimal places. Price changes are shown to three decimal places

## Copper and brass specifications

Assessment	Quality	Transacted/ transactable	Min lot size	Timing	Currency/unit	Pricing basis	Delivery
<b>Copper cathode premiums</b>							
Grade A del US midwest	See the <a href="#">Argus Metal Prices methodology</a>						
Grade A del US midwest transaction	See the <a href="#">Argus Metal Prices methodology</a>						
Grade A in-warehouse Rotterdam	LME copper grade A	day of assessment	25t	prompt	\$/t	differential	Rotterdam
Grade A del southern Europe	LME copper grade A	day of assessment	25t	prompt	\$/t	differential	Spain, Italy, Greece
<b>Copper scrap - delivered Europe</b>							
#1 wire and tube cash spread	ISRI Berry/Candy	day of assessment	38,000lbs	30 days	percentage	percentage	Netherlands, Germany, Greece, Spain, Italy
#2 copper cash spread	ISRI Birch/Cliff	day of assessment	38,000lbs	30 days	percentage	percentage	Netherlands, Germany, Greece, Spain, Italy
Bare bright cash spread	ISRI Barley	day of assessment	38,000lbs	30 days	percentage	percentage	Netherlands, Germany, Greece, Spain, Italy
Brass scrap 70:30 (C260) spread	ISRI Label, 68.5- 71.5% copper	day of assessment	38,000lbs	30 days	percentage	percentage	Germany, Belgium, Italy
Brass scrap 70:30 (C260) transaction	calculated as (the Argus brass scrap 70:30 (C260) spread del Europe assessment/100)*((LME Copper cash settlement * 0.7) + LME Zinc cash settlement * 0.3)						
<b>Copper scrap - delivered US</b>							
Bare bright cash spread	See the <a href="#">Argus Metal Prices methodology</a>						
Bare bright transaction	See the <a href="#">Argus Metal Prices methodology</a>						
Bare bright next active month spread	See the <a href="#">Argus Metal Prices methodology</a>						

Copper and brass specifications							
Assessment	Quality	Transacted/ transactable	Min lot size	Timing	Currency/unit	Pricing basis	Delivery
#1 wire and tube cash spread	See the <a href="#">Argus Metal Prices methodology</a>						
#1 wire and tube transaction	See the <a href="#">Argus Metal Prices methodology</a>						
#1 wire and tube next active month spread	See the <a href="#">Argus Metal Prices methodology</a>						
Brass radiators	See the <a href="#">Argus Metal Prices methodology</a>						
Brass red brass solids	See the <a href="#">Argus Metal Prices methodology</a>						
Brass 360 rod borings	See the <a href="#">Argus Metal Prices methodology</a>						
<b>Copper scrap - cif Asia-Pacific</b>							
Bare bright cash spread	ISRI Barley	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
Bare bright next active month spread	ISRI Barley	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
#1 wire and tube cash spread	ISRI Berry/Candy	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
#1 wire and tube next active month spread	ISRI Berry/Candy	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
#2 copper cash spread	ISRI Birch/Cliff	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
#2 copper transaction	calculated as the Comex copper settlement + the Argus #2 copper cash spread assessment						
#2 copper next active month spread	ISRI Birch/Cliff	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif major ports in China, Taiwan, South Korea and Japan
Copper scrap motors	ISRI Elmo	day of assessment	42,000lbs	30-60 days	\$/lb	outright	cif Shanghai, Ningbo, Tianjin, Dalian, Guangzhou
Brass scrap yellow brass	ISRI Honey	since last assessment	42,000lbs	30-60 days	\$/lb	outright	cif China, Taiwan, South Korea, Japan
<b>Brass alloy C200-series scrap - delivered</b>							
C200-series copper cash spread	See the <a href="#">Argus Metal Prices methodology</a>						
C200-series copper next active spread	See the <a href="#">Argus Metal Prices methodology</a>						
C200-series zinc cash spread	See the <a href="#">Argus Metal Prices methodology</a>						
C210 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						
C220 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						
C230 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						
C240 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						

**Copper and brass specifications**

Assessment	Quality	Transacted/ transactable	Min lot size	Timing	Currency/unit	Pricing basis	Delivery
C260 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						
C270 cash transaction	See the <a href="#">Argus Metal Prices methodology</a>						
<b>Brass/bronze alloy</b>							
C83600	See the <a href="#">Argus Metal Prices methodology</a>						
C84400	See the <a href="#">Argus Metal Prices methodology</a>						
C87300	See the <a href="#">Argus Metal Prices methodology</a>						
C87500	See the <a href="#">Argus Metal Prices methodology</a>						
C95800	See the <a href="#">Argus Metal Prices methodology</a>						
C89833	See the <a href="#">Argus Metal Prices methodology</a>						
C89836	See the <a href="#">Argus Metal Prices methodology</a>						

## Nickel and zinc

### Introduction

Argus Metals International publishes price assessments and market commentary on the international nickel and zinc markets.

### Basis of assessment

Assessments are for the named material meeting the lot size, timing and delivery criteria listed in the table below. Assessments are published as a low-high range of prices that traded, or could have traded, on the day or during the period shown.

#### Note

- Zinc premiums are assessed as a differential to the LME official cash price

### Timing of assessment

Nickel prices are assessed and published weekly, on Thursday. Zinc prices are assessed and published weekly, on Monday. For most assessments, market information received after 4pm Houston time on the day of assessment may not be included in the assessment process.

For European price assessments — nickel cathode premiums and zinc — market information received after 5pm London time on the day of assessment may not be included in the assessment process.

### Rounding

Price assessments are published to two decimal places. Price changes are shown to three decimal places

### Nickel and zinc specifications

Assessment	Quality	Minimum lot size	Currency/unit	Assessment frequency	Transacted/transactable	Timing	Delivery
<b>Nickel cathode premiums - Europe</b>							
4x4inch in-warehouse Rotterdam	nickel 99.8% minimum, 4x4inch cut cathodes	truckload	\$/t	weekly	on day of assessment	prompt	in-warehouse Rotterdam
Full plate in-warehouse Rotterdam	nickel 99.8% minimum, full plate uncut cathode	truckload	\$/t	weekly	on day of assessment	prompt	in-warehouse Rotterdam
<b>Nickel cathode premiums - delivered US</b>							
4x4inch (small lots)	See the <a href="#">Argus Metal Prices methodology</a>						
4x4inch (truckloads)	See the <a href="#">Argus Metal Prices methodology</a>						
4x4inch (truckloads) transaction	See the <a href="#">Argus Metal Prices methodology</a>						
1x1inch (small lots)	See the <a href="#">Argus Metal Prices methodology</a>						
1x1inch (truckloads)	See the <a href="#">Argus Metal Prices methodology</a>						
<b>Zinc</b>							
Special high grade in-warehouse Rotterdam premium	LME Zinc		\$/t	weekly	on day of assessment	30 days	in-warehouse Rotterdam
Special high grade del US premium	See the <a href="#">Argus Metal Prices methodology</a>						
Special high grade del US transaction	See the <a href="#">Argus Metal Prices methodology</a>						
Scrap old zinc diecast del US	See the <a href="#">Argus Metal Prices methodology</a>						

## Minor metals

### Introduction

Argus Metals International publishes price assessments and market commentary on the international minor metals markets.

### Basis of assessment

Minor metals price assessments are for spot physical material for prompt delivery. Product specifications for each assessment, such as currency, unit of trade and quality, follow recognised industry standards such as norms published by the Minor Metals Trade Association and other widely used specifications.

Price assessments are published as low-high ranges.

Assessments are for material certified as conflict free using recognised traceability systems in compliance with relevant legislation, and delivered to the market through legal routes, with relevant export taxes paid.

Fob China assessments are basis export duty paid, including any export taxes levied by China, and VAT. Fob China prices are not inclusive of any import duty charged by the importing country. China domestic prices are basis ex-works, VAT paid, unless otherwise stated. European prices are basis in-warehouse Rotterdam, duty unpaid, unless otherwise stated. Fob US prices in-warehouse are inclusive of duties.

In most cases, information relating to material that falls outside of the stated specifications will not be used in the assessment process. Exceptions may be made if an acceptable and appropriate normalisation process can be applied.

In markets where liquidity is split across several locations, verified spot trades may be normalised to a single reference hub, for example by making adjustments for transportation costs, where appropriate and in line with market practice. See below for a full list of product specifications.

### Timing of assessment

European, Chinese and Indian prices are assessed twice weekly, on Tuesday and Thursday, unless specified in the tables below. US prices are assessed weekly, with the exception of high-temperature metals and scrap metals, which are assessed monthly. Monthly price assessments are made and published on the first publication date of the month.

### Rounding

Price assessments are published to two decimal places. Price changes are shown to three decimal places.

Electronic metals specifications										
Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency	
<b>Arsenic</b>										
min 99% du Rotterdam	arsenic 99% minimum	in-warehouse	Rotterdam	duty unpaid	1t (+/-2%)	lumpy - fist size and downwards	\$/lb	prompt	twice weekly	
min 99% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
<b>Bismuth</b>										
min 99.99% du Rotterdam	bismuth 99.99% minimum	in-warehouse	Rotterdam	duty unpaid	1t (+/-2%)	ingots	\$/lb	prompt	twice weekly	
min 99.99% ex-works China	bismuth 99.99% minimum	ex-works	China	no	1t (+/-2%)	ingots	Yn/t	prompt	twice weekly	
min 99.99% fob China	bismuth 99.99% minimum	fob	China	export duty paid	1t (+/-2%)	ingots	\$/lb	prompt	twice weekly	
Ingot min 99.99% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
<b>Gallium</b>										
min 99.9999% ex-works China	gallium 99.9999% minimum	ex-works	China	no	50kg (+/-2%)	ingots	Yn/kg	prompt	twice weekly	
min 99.99% ex-works China	gallium 99.99% minimum	ex-works	China	no	50kg (+/-2%)	ingots	Yn/kg	prompt	twice weekly	
min 99.99% fob China	gallium 99.99% minimum	fob	China	export duty paid	50kg (+/-2%)	ingots	\$/kg	prompt	twice weekly	
min 99.99% cif main airport	gallium 99.99% minimum	cif main airport	Europe	duty paid	50kg (+/-2%)	ingots	\$/kg	prompt	twice weekly	
<b>Germanium</b>										
Dioxide min 99.999% ex-works China	germanium dioxide 99.999% minimum; germanium 69% approximately	ex-works	China	no	50kg (+/-2%)	white powder	Yn/kg	prompt	twice weekly	
Dioxide min 99.999% fob China	germanium dioxide 99.999% minimum; germanium 69% approximately	fob	China	export duty paid	50kg (+/-2%)	white powder	\$/kg	prompt	twice weekly	
Dioxide min 99.99% du Rotterdam	germanium dioxide 99.99% minimum; germanium 69% approximately	in-warehouse	Rotterdam	duty unpaid	50kg (+/-2%)	white powder	\$/kg	prompt	twice weekly	
Metal (zone refined ingot) min 99.999% ex-works China	germanium 99.999% minimum	ex-works	China	no	50kg (+/-2%)	ingots	Yn/kg	prompt	twice weekly	
Metal min 99.99% cif main airport	germanium 99.99% minimum	cif main airport	Europe	duty paid	50kg (+/-2%)	ingots, typically 1-5kg each	\$/kg	prompt	twice weekly	
Metal min 99.999% fob China	germanium 99.999% minimum	fob	China	export duty paid	50kg (+/-2%)	ingots	\$/kg	prompt	twice weekly	
<b>Indium</b>										
min 99.99% du Rotterdam	indium 99.99% minimum	in-warehouse	Rotterdam	duty unpaid	50kg (+/-2%)	ingots, usually 0.5-3.5kg, occasionally 10kg	\$/kg	prompt	twice weekly	
min 99.99% ex-works China	indium 99.99% minimum	ex-works	China	no	50kg (+/-2%)	ingots, usually 0.5-3.5kg, occasionally 10kg	Yn/kg	prompt	twice weekly	
min 99.99% fob China	indium 99.99% minimum	fob	China	export duty paid	50kg (+/-2%)	ingots, usually 0.5-3.5kg, occasionally 10kg	\$/kg	prompt	twice weekly	
Ingot min 99.99% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
min 99% ex-works China	indium 99% minimum	ex-works	China	no	50kg (+/-2%)	ingots, usually 0.5-3.5kg, occasionally 10kg	Yn/kg	prompt	twice weekly	

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
<b>Selenium</b>									
Dioxide min 99% ex-works China	selenium 99% minimum	ex-works	China	no	250kg (+/- 2%)	powder	Yn/kg	prompt	twice weekly
min 99.5% du Rotterdam	selenium 99.5% minimum	in-warehouse	Rotterdam	duty unpaid	250kg (+/- 2%)	powder of -200 mesh or granules sizing 1-5mm	\$/lb	prompt	twice weekly
min 99.5% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
Powder min 99.9% ex-works China	selenium 99.9% minimum	ex-works	China	no	250kg (+/- 2%)	powder of -200 mesh or granules sizing 1-5mm	Yn/kg	prompt	twice weekly
<b>Tantalum</b>									
Pentoxide min 99.5% ex-works China	tantalum pentoxide 99.5% minimum	ex-works	China	17pc VAT	1t	powder	Yn/kg	prompt	twice weekly
Tantalite basis 30% Ta2O5 du Rotterdam (per lb of Ta2O5)	30% tantalum pentoxide, thorium dioxide + triuranium octoxide 0.5% maximum	in-warehouse	Rotterdam	duty unpaid	10t	lump concentrate	\$/lb	prompt	twice weekly
min 99.8% du Rotterdam	tantalum 99.8% minimum; carbon/nickel/iron/titanium 0.01%, manganese/silicon/phosphorus/sulphur 0.005%, molybdenum 0.02%, niobium 0.1%, tungsten 0.05%, oxygen 0.03%, cadmium 0.003%, magnesium/antimony 0.002%, arsenic 0.001%, and silver 0.0005% maximum	in-warehouse	Rotterdam	duty unpaid	500kg (+/- 2%)	uniform bars/rods/ingot of 4" (10cm)	\$/kg	prompt	twice weekly
<b>Tellurium</b>									
99.99% ex-works China	tellurium 99.99% minimum	ex-works	China	no	500kg (+/- 2%)	ingots, sticks or powder	Yn/kg	prompt	twice weekly
min 99.99% du Rotterdam	tellurium 99.99% maximum	in-warehouse	Rotterdam	duty unpaid	100kg (+/- 2%)	ingots, sticks or powder	\$/kg	prompt	twice weekly
min 99.95% fob US	See the <a href="#">Argus Metal Prices methodology</a>								
<b>Zirconium</b>									
Fused zirconia 98.5% ZrO ex-works China	zirconium (hafnium) dioxide 98.5% minimum, aluminum (II) oxide 0.40%, silicon dioxide 0.40%, ferrous oxide 0.08%, and titanium dioxide 0.20% maximum	ex-works	China	no	10t	clean shot	Yn/t	prompt	twice weekly
Oxychloride 36% Zr(Hf)O2 ex-works China	zirconium (hafnium) dioxide 36% minimum; silicon dioxide 0.01%, titanium dioxide 0.001%, ferric oxide 0.002%, sodium oxide 0.005%, calcium oxide 0.01%, and SiO4 0.005% maximum	ex-works	China	no	50t	crystalline powder	Yn/t	prompt	twice weekly
Oxychloride 36% Zr(Hf)O2 fob China	zirconium (hafnium) dioxide 36% minimum; silicon dioxide 0.01%, titanium dioxide 0.001%, ferric oxide 0.002%, sodium oxide 0.005%, calcium oxide 0.01%, and SiO4 0.005% maximum.	fob	China	export duty paid	50t	crystalline powder	\$/t	prompt	twice weekly
Silicate 65% Zr(Hf)O2 ex-works China	zirconium (hafnium) dioxide ≥ 64.5%, Iron(II) oxide 0.15%, and titanium oxide 0.20% maximum	ex-works	China	no	50t	powder	Yn/t	prompt	twice weekly

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
Sponge 99.4% Zr+Hf ex-works China	zirconium + hafnium 99.4% minimum; hafnium 0.01%, carbon 0.025%, oxygen 0.14%, nitrogen 0.005%, chlorine 0.13%, aluminium 0.0075%, boron 0.00005%, cadmium 0.00005%, cobalt 0.002%, copper 0.003%, chromium 0.02%, iron 0.15%, manganese 0.005%, molybdenum 0.005%, nickel 0.0007%, silicon 0.012%, titanium 0.005%, tungsten 0.005%, and uranium 0.0003% maximum	ex-works	China		2-3T (+/-2%)	grains of 5-35mm, 90% minimum, free from fines	Yn/kg	prompt	twice weekly

**Battery metals specifications**

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
<b>Antimony</b>									
Ingot min 99.65% ex-works China	antimony 99.65% minimum	ex-works	China	no	10t (+/-2%)	ingots	Yn/t	prompt	twice weekly
Ingot min 99.65% fob China	antimony 99.65% minimum	fob	China	export duty paid	10t (+/-2%)	ingots	\$/t	prompt	twice weekly
min 99.65% cif US	See the <a href="#">Argus Metal Prices methodology</a>								
Regulus Grade II min 99.65% Sb du Rotterdam	antimony 99.65% minimum; arsenic 0.15%, selenium 0.005%, and sulphur 0.06% maximum	in-warehouse	Rotterdam	duty unpaid	10t (+/-2%)	ingots (regulus)	\$/t	prompt	twice weekly
Regulus Trioxide grade min 99.65% Sb du Rotterdam	antimony 99.65% minimum; arsenic 0.15%, selenium 0.005%, bismuth 0.01%, iron 0.02%, copper 0.02%, lead 0.2%, and sulphur 0.06% maximum	in-warehouse	Rotterdam	duty unpaid	10t (+/-2%)	ingots (regulus)	\$/t	prompt	twice weekly
Trioxide min 99.5% ex-works China	antimony 99.5% minimum	ex-works	China	no	10t (+/-2%)	ingots	Yn/t	prompt	twice weekly
Trioxide min 99.5% fob China	antimony 99.5% minimum	fob	China	export duty paid	25t (+/-2%)	ingots	\$/t	prompt	twice weekly
<b>Cadmium</b>									
min 99.99% du Rotterdam	cadmium 99.99% minimum	in-warehouse	Rotterdam	duty unpaid	5t (+/-2%)	sticks, ingots or balls	\$/lb	prompt	twice weekly
min 99.99% ex-works China	cadmium 99.99% minimum	ex-works	China	no	5t (+/-2%)	sticks, ingots or balls	Yn/t	prompt	twice weekly
min 99.99% cif India	cadmium 99.99% minimum	cif	India	duty paid	5t (+/-2%)	sticks, ingots or balls	Indian rupee/kg	prompt	twice weekly
min 99.99% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
min 99.95% du Rotterdam	cadmium 99.95% minimum	in-warehouse	Rotterdam	duty unpaid	5t (+/-2%)	sticks, ingots or balls	\$/lb	prompt	twice weekly
min 99.95% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
min 99.95% cif India	cadmium 99.95% minimum	cif	India	duty paid	5t (+/-2%)	sticks, ingots or balls	Indian rupee/kg	prompt	twice weekly
oxide min 99.5% ex-works China	cadmium 99.5% minimum	ex-works	China	no	5t (+/-2%)	sticks, ingots or balls	Yn/t	prompt	twice weekly



Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
<b>Cobalt</b>									
(Electrolytic metal) min 99.8% ex-works China	cobalt 99.8% minimum	ex-works	China	no	1t (+/-2%)	cut cathode	Yn/kg	prompt	twice weekly
Chloride min 24% ex-works China	cobalt 24% minimum	ex-works	China	no	1t (+/-2%)	powder	Yn/t	prompt	twice weekly
min 99.8% alloy grade du Rotterdam	cobalt 99.8% minimum	in-warehouse	Rotterdam	duty unpaid	1t (+/-2%)	cut cathode, rounds	\$/lb	prompt	twice weekly
min 99.8% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
min 99.8% chemical grade du Rotterdam	cobalt 99.8% minimum	in-warehouse	Rotterdam	duty unpaid	1t (+/-2%)	broken cathode, briquettes	\$/lb	prompt	twice weekly
min 99.3% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
Oxide 72% ex-works China	cobalt 72% minimum	ex-works	China	no	1t (+/-2%)	powder	Yn/kg	prompt	twice weekly
Powder min 99.8% ex-works China	cobalt 99.8% minimum	ex-works	China	no	1t (+/-2%)	powder	Yn/kg	prompt	twice weekly
Sulphate min 20% ex-works China	cobalt 20% minimum	ex-works	China	no	1t (+/-2%)	powder	Yn/t	prompt	twice weekly
Tetroxide min 73% ex-works China	cobalt 73% minimum	ex-works	China	no	1t (+/-2%)	powder	Yn/kg	prompt	twice weekly
<b>Lithium</b>									
Carbonate 99.5% ex-works China	lithium carbonate 99.5pc minimum	ex-works	China	17pc VAT	1t	powder, packaged in barrel/bag	Yn/t	prompt	twice weekly
Cobalt oxide min 60% Co ex-works China	cobalt 60% minimum	ex-works	China	no	100kg	powder	Yn/kg	prompt	twice weekly
Hydroxide 56.5% ex-works China	lithium hydroxide monohydrate 56.5pc minimum	ex-works	China	17pc VAT	1t	powder, packaged in barrel/bag	Yn/t	prompt	twice weekly
<b>Mercury</b>									
min 99.99% cif main port	mercury 99.99% minimum	cif	main port	duty unpaid	50 flasks each containing 34.5kg net, zero tolerance (+/-0%)	free flowing liquid	\$/flask	prompt	twice weekly

Light metals specifications									
Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
<b>Magnesium</b>									
Alloy min 90% Mg AZ91 ex-works China	magnesium 90% minimum	ex-works	China	no	20t (+/-2%)	ingot	Yn/t	prompt	twice weekly
Alloy min 90% Mg AZ91 fob China	Magnesium 90% minimum	fob	China	export duty paid	20t (+/-2%)	ingot	\$/t	prompt	twice weekly
min 99.9% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
min 99.9% du Rotterdam	magnesium 99.9% minimum For reference purposes only - iron 0.04%, sodium 0.04%, chlorine 0.04%, molybdenum 0.03%, silicon 0.02%, aluminium 0.02%, and copper 0.01% maximum	in-warehouse	Rotterdam	duty unpaid	20t (+/-2%)	ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight	\$/t	prompt	twice weekly
min 99.9% ex-works China	magnesium 99.9% minimum; iron 0.04%, sodium 0.04%, chlorine 0.04%, molybdenum 0.03%, silicon 0.02%, aluminium 0.02%, and copper 0.01% maximum	ex-works	China	no	20t (+/-2%)	ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight	Yn/t	prompt	twice weekly
min 99.9% fob China	magnesium 99.9% minimum; iron 0.04%, sodium 0.04%, chlorine 0.04%, molybdenum 0.03%, silicon 0.02%, aluminium 0.02%, and copper 0.01% maximum	fob	China	export duty paid	20t (+/-2%)	ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight	\$/t	prompt	twice weekly
Powder 99.9% Mg 20-80 mesh ex-works China	magnesium 99.9% minimum	ex-works	China	no	20t (+/-2%)	powder	Yn/t	prompt	twice weekly
Powder 99.9% Mg 20-80 mesh fob China	magnesium 99.9% minimum	fob	China	export duty paid	20t (+/-2%)	powder	\$/t	prompt	twice weekly
<b>Manganese</b>									
Briquette min 97% Mn ex works China	manganese 97pc minimum	ex-works	China	17pc VAT	10t	briquette	Yn/t	prompt	twice weekly
Briquette 97% Mn fob China	manganese 97% minimum	fob	China	export duty paid	25t (+/-2%)	briquette	\$/t	prompt	twice weekly
Electrolytic metal min 99.7% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
Flake 99.7% Mn ex-works China	manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum	ex-works	China	no	25t (+/-2%)	flakes	Yn/t	prompt	twice weekly

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
Flake min 99.7% fob China	manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum	fob	China	export duty paid	25t (+/-2%)	flakes	Yn/t	prompt	twice weekly
Flake min 99.7% du Rotterdam	manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum	in-warehouse	Rotterdam	duty unpaid	25t (+/-2%)	flakes	\$/t	prompt	twice weekly
Lump min 95% Mn ex works China	manganese 95% minimum	ex-works	China	17pc VAT	10t	lump	Yn/t	prompt	twice weekly
Lump 95% Mn fob China	manganese 95% minimum	fob	China	export duty paid	25t (+/-2%)	lump	\$/t	prompt	twice weekly
<b>Silicon</b>									
5-5-3 min 98.5% Si dat Chinese ports	silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum	delivered at terminal	Chinese ports		25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	Yn/t	prompt	twice weekly
5-5-3 min 98.5% Si fob China	silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum	fob	China	export duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	\$/t	prompt	twice weekly
5-5-3 min 98.5% Si ddp Europe works	silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum	ddp	Europe	duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	€/t	prompt	twice weekly
5-5-3 min 98.5% Si fca duty paid Rotterdam	silicon 98.5% min; iron 0.5% max, aluminium 0.5% max, and calcium 0.3% max	fca	Rotterdam	duty paid	100t (+/-2%)	lumps, in range 10-100mm, 90% minimum	€/t	90 days	weekly
5-5-3 min 98.5% Si fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
5-5-3 min 98.5% Si fob US warehouse 90 days	See the <a href="#">Argus Metal Prices methodology</a>								
4-4-1 min 99% Si dat Chinese ports	silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum	delivered at terminal	Chinese ports		25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	Yn/t	prompt	twice weekly
4-4-1 min 99% Si fob China	silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum	fob	China	export duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	\$/t	prompt	twice weekly
4-4-1 min 99% Si ddp Europe works	silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum	ddp	Europe	duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	€/t	prompt	twice weekly
3-3-0-3 min 99% Si fca Europe	silicon 99% minimum; iron 0.3%, aluminium 0.3%, calcium 0.03% maximum	fca	Europe	duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	€/t	prompt	twice weekly
2-2-0-2 min 99.5% Si fca Europe	silicon 99.5% minimum; iron 0.2%, aluminium 0.2%, calcium 0.02% maximum	fca	Europe	duty paid	25t (+/-2%)	lumps, in range 10-100mm, 90% minimum	€/t	prompt	twice weekly
<b>Titanium</b>									
Concentrate 50% TiO2 ex-works China (VAT unpaid)	titanium oxide 50% minimum	ex-works	China	VAT unpaid	50t	lump	Yn/t	prompt	twice weekly
Concentrate 46% TiO2 ex-works China (VAT unpaid)	titanium oxide 46% minimum, lead 0.30% maximum, sulphur 0.05% maximum	ex-works	China	VAT unpaid	50t	lump	Yn/t	prompt	twice weekly
Ingot min 99% Ti pure TA1 ex-works China	titanium 99% minimum, iron 0.25%, carbon 0.10%, nitrogen 0.03%, oxygen 0.20%, and hydrogen 0.015%	ex-works	China	no	2t	ingots	Yn/t	prompt	twice weekly
Ingot min 99% Ti pure TA2 ex-works China	titanium 99% minimum, iron 0.30%, carbon 0.10%, nitrogen 0.05%, oxygen 0.25%, and hydrogen 0.015%	ex-works	China	no	2t	ingots	Yn/t	prompt	twice weekly
Ingot min 99% Ti pure TA3 ex-works China	titanium 99% minimum, iron 0.40%, carbon 0.10%, nitrogen 0.05%, oxygen 0.30%, and hydrogen 0.015%	ex-works	China	no	2t	ingots	Yn/t	prompt	twice weekly
Ingot CP Grade 1 Ingot	CP Grade 1: maximum iron 0.20%, carbon 0.08%, oxygen 0.18%, nitrogen 0.03%, hydrogen 0.015% , titanium - balance	fob	Rotterdam	duty unpaid	5t	ingots	\$/kg	prompt	monthly

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
Ingot CP Grade 2 Ingot	CP grade 2: maximum iron 0.30%, carbon 0.10%, oxygen 0.25%, nitrogen 0.03%, hydrogen 0.015%, titanium - balance	fob	Rotterdam	duty unpaid	5t	ingots	\$/kg	prompt	monthly
Ingot CP Grade 1 Slab	CP Grade 1: maximum iron 0.20%, carbon 0.08%, oxygen 0.18%, nitrogen 0.03%, hydrogen 0.015% Ti - b titanium - balance	fob	Rotterdam	duty unpaid	10t	As cast, thickness max 250mm	\$/kg	prompt	monthly
Ingot CP Grade 2 Slab	CP grade 2: maximum iron 0.30%, carbon 0.10%, oxygen 0.25%, nitrogen 0.03%, hydrogen 0.015%, Ti - titanium - balance	fob	Rotterdam	duty unpaid	10t	As cast, thickness max 250mm	\$/kg	prompt	monthly
Ingot 6Al 4V ingot fob US producer	See the <a href="#">Argus Metal Prices methodology</a>								
Ingot 6Al-4V ingot in-warehouse Rotterdam	Titanium - balance, aluminium 5.5-6.75%, vanadium 3.5-4.5%, iron 0.40% maximum, oxygen 0.08% maximum, carbon 0.08% maximum, nitrogen 0.05% maximum, hydrogen 0.015% maximum	in-warehouse	Rotterdam	no	5t	ingots	\$/kg	prompt	monthly
Slag min 92% TiO2 ex-works China	titanium dioxide 92% minimum	ex-works	China	no	50t	sand	Yn/t	prompt	twice weekly
Sponge 99.7% Ti ex-works China	titanium 99.7% minimum	ex-works	China	no	10t	sponge	Yn/t	prompt	twice weekly
Sponge 99.6% Ti ex-works China	99.6% titanium minimum MHT- 110; iron 0.10%, silicon 0.03%, chlorine 0.08%, carbon 0.03%, nitrogen 0.02%, oxygen 0.08%, manganese 0.01%, magnesium 0.07%, and hydrogen 0.005% maximum	ex-works	China	no	5t	sponge 0.83mm-12.7mm 90% minimum	Yn/t	prompt	twice weekly
Sponge TG-TV 10x30mm du Rotterdam	titanium 97.75% minimum; iron 1.9% and nitrogen 0.10% maximum - origin in seller's option		Rotterdam	duty unpaid	10mt (+/-2%)	sponge lumps in range 10-30mm	\$/kg	prompt	twice weekly
Tetrachloride min 99.9% TiCl4 ex-works China	Titanium tetrachloride 99.96% minimum, silicon tetrachloride 0.01% maximum, vanadium oxytrichloride%, 0.0012% maximum, FeCl3 0.001 maximum	ex-works	China	no	1t	liquid, in steel drum	Yn/t	prompt	twice weekly

Mineral sands specifications										
Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency	
<b>Rutile</b>										
Hainan rutile min 90% TiO <sub>2</sub> ex-works China	"titanium dioxide minimum 90%, phosphorus maximum 0.03%, sulphur maximum 0.03%	ex-works	China	17pc VAT	100t	sand	Yn/t	prompt	twice weekly	
Australian rutile min 95% TiO <sub>2</sub> ex-works China	titanium dioxide minimum 95%, phosphorus maximum 0.03%, sulphur maximum 0.03%	ex-works	China	17pc VAT	100t	sand	Yn/t	prompt	twice weekly	
<b>Zircon sand</b>										
Hainan zircon sand min 66% (Zr.Hf)O <sub>2</sub> ex works China	zirconium hafnium oxide minimum 65%, titanium dioxide maximum 0.15%, Iron (III) oxide maximum 0.1%	ex-works	China	excluding 17pc VAT	100t	sand	Yn/t	prompt	twice weekly	
Australian zircon sand min 66% (Zr.Hf)O <sub>2</sub> cif China	zirconium hafnium oxide minimum 66%, titanium dioxide maximum 0.1%, iron (III) oxide maximum 0.1%, Murray Basin of Iluka	cif	China ports	17pc VAT	100t	sand	\$/t	prompt	twice weekly	
<b>High-temperature metals specifications</b>										
Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency	
<b>Chromium (alumino-thermic)</b>										
min 99% du Rotterdam	chromium 99% minimum	in-warehouse	Rotterdam	duty unpaid	10t (+/-2%)	lumps	\$/t	prompt	twice weekly	
min 99% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
min 99% Cr ex-works China	chromium 99% minimum	ex-works	China	no	10t (+/-2%)	lumps	Yn/t	prompt	twice weekly	
<b>Hafnium</b>										
min 99pc Hf, max 1pc Zr du Rotterdam	hafnium 99% minimum (hafnium + zirconium 99.8% minimum), zirconium 1% maximum, aluminium 0.01% maximum, iron 0.05% maximum, nitrogen 0.01% maximum, oxygen 0.05% maximum, trace elements each 0.01% maximum	in-warehouse	Rotterdam	duty unpaid	100kg	"Uniform pieces of max 3kg (excluding sponge) in drums or cases	\$/kg	prompt	twice weekly	
<b>Molybdenum</b>										
Oxide min 57% Mo du Rotterdam (per lb of Mo)	molybdenum 57% minimum; carbon 0.1%, phosphorus 0.05%, sulphur 0.1%, copper 0.5%, and lead 0.05% maximum	in-warehouse	Rotterdam	duty unpaid	10t	powder 0-4mm, packaged in drums 250/400kg each	\$/lb	prompt	twice weekly	
Oxide min 57% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
<b>Niobium</b>										
Pentoxide min 99.5% ex works China	niobium pentoxide 99.5% minimum	ex-works	China	17pc VAT	1t	powder	Yn/kg	prompt	twice weekly	

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
<b>Rhenium</b>									
Ammonium perrhenate (APR) min 69.2% Re (basic grade) du Rotterdam (per kg of Re)	rhenium 69.2% minimum; potassium 0.05%, sodium 0.05%, phosphorus 0.05%, aluminium 0.05%, magnesium 0.05%, iron 0.05%, calcium 0.05%, silicon 0.05%, manganese 0.05%, copper 0.05%, molybdenum 0.05%, nickel 0.05%, sulphur 0.05%, and water 0.1% maximum	in-warehouse	Rotterdam	duty unpaid	100kg material (+/-2%)	white free flowing powder/crystals	\$/kg	prompt	twice weekly
Ammonium perrhenate (APR) min 69.4% Re (catalyst grade) dp Rotterdam (per kg of Re)	rhenium 69.4% minimum; potassium 0.02%, chlorine 0.01%, sodium 0.005%, and phosphorus 0.02% maximum; molybdenum 100 parts per million (ppm) maximum; Other impurities as per customer specification; Minimum specification: total 200ppm arsenic, calcium, iron, potassium, magnesium, sodium, lead, and tin maximum in total, not exceeding 50ppm each; 200ppm arsenic, cobalt, chromium, copper, manganese, nickel, antimony, silicon and tin maximum, not exceeding 50ppm each. Heavy metals (lead, antimony, cadmium) 30ppm maximum each	in-warehouse	Rotterdam	duty paid	20kg material (+/- 2%)	white free flowing powder/crystals	\$/kg	prompt	twice weekly
Ammonium perrhenate (APR) min 69.4% Re ex-works China	rhenium 69.4% minimum	ex-works	China	no	100kg material (+/- 2%)	white free flowing powder/crystals	Yn/kg	prompt	twice weekly
Ammonium perrhenate (APR) min 69.4% Re (catalyst grade) fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
Pellets min 99.9% Re dp Rotterdam	rhenium 99.9% minimum	in-warehouse	Rotterdam	duty paid	50kg (+/-2%)	pellets	\$/lb	prompt	twice weekly
Min 99.9% fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
<b>Tungsten</b>									
Ammonium paratungstate (APT) du Rotterdam (per mtu of WO <sub>3</sub> )	tungsten trioxide 88.5% minimum; aluminium 10 parts per million (ppm), arsenic 5ppm, bismuth 5ppm, calcium 5ppm, cadmium 5ppm, cobalt 5ppm, chromium 5ppm, copper 5ppm, iron 10 ppm, phosphorus 10ppm, manganese 10 ppm, magnesium 10 ppm, molybdenum 20ppm, sodium 10ppm, antimony 5ppm, silicon 10ppm, tin 5ppm, titanium 5ppm, and vanadium 5ppm maximum	in-warehouse	Rotterdam	duty unpaid	18t (+/-2%)	white finely divided free-flowing crystals	\$/t	prompt	twice weekly

Assessment	Grade	Basis	Location	Duties/Tariffs	Minimum lot size	Form	Unit	Timing	Assessment frequency
Ammonium paratungstate (APT) fob China	tungsten trioxide 88.5% minimum; aluminium 10 parts per million (ppm) , arsenic 5ppm, bismuth 5ppm, calcium 5ppm, cadmium 5ppm, cobalt 5ppm, chromium 5ppm, copper 5ppm, iron 10ppm, phosphorus 10ppm, manganese 10ppm, magnesium 10ppm, molybdenum 20ppm, sodium 10ppm, antimony 5ppm, silicon 10ppm, tin 5ppm, titanium 5ppm, and vanadium 5ppm maximum	fob	China	export duty paid	18t (+/-2%)	white finely divided free-flowing crystals	\$/t	prompt	twice weekly
Ammonium paratungstate (APT) min 88.5% ex-works China	tungsten trioxide 88.5% minimum; aluminium 10 parts per million (ppm), arsenic 5ppm, bismuth 5ppm, calcium 5ppm, cadmium 5ppm, cobalt 5ppm, chromium 5ppm, copper 5ppm, iron 10ppm, phosphorus 10ppm, manganese 10ppm, magnesium 10ppm, molybdenum 20ppm, sodium 10ppm, antimony 5ppm, silicon 10ppm, tin 5ppm, titanium 5ppm, and vanadium 5ppm maximum	ex-works	China	no	10t (+/-2%)	white finely divided free-flowing crystals	Yn/t	prompt	twice weekly
Carbide min 99.7% ex-works China	tungsten 99.7% minimum	ex-works	China	no	5t	powder – fraction size 1-10 microns	Yn/kg	prompt	twice weekly
Carbide powder (3-4micron) fob China	tungsten 99.7% minimum	fob	China	export duty paid	1t	powder 3-4 microns	\$/kg	prompt	twice weekly
Min 99.9% min Chinese bar del US consumer	See the <a href="#">Argus Metal Prices methodology</a>								
Oxide (Yellow/Blue oxide) fob China	tungsten trioxide purity 99.95% minimum	fob	China	export duty paid	10t	powder, in drums	\$/t	prompt	twice weekly
Oxide min 99.95% ex-works China	tungsten trioxide purity 99.95% minimum	ex-works	China	no	1t	powder, in drums	Yn/t	prompt	twice weekly
Concentrates min 65% ex-works China	tungsten 65% minimum	ex-works	China	no	5t	lump concentrate	Yn/t	prompt	twice weekly
<b>Vanadium</b>									
Pentoxide fused flake min 98% du Rotterdam (per lb of V2O5)	vanadium pentoxide 98% minimum; silicon 0.25%, iron 0.3%, sulphur 0.03%, phosphorus 0.05%, arsenic 0.02%, and Na2+K2O 1.5% maximum	in-warehouse	Rotterdam	duty unpaid	10t (+/-2%)	brown flakes 55x55x5mm	\$/lb	prompt	twice weekly
Pentoxide 98% V2O5 ex-works China	vanadium pentoxide 98% minimum	ex-works	China	no	10t (+/-5%)	flakes	Yn/t	prompt	twice weekly

**Scrap metal specifications**

**Assessment**

Molybdenum contained in 316 stainless scrap solids del US consumer	See the <a href="#">Argus Metal Prices methodology</a>
Molybdenum scrap 99.7% airmelt del US consumer	See the <a href="#">Argus Metal Prices methodology</a>
Molybdenum scrap 99.9% pure vacuum del US processor	See the <a href="#">Argus Metal Prices methodology</a>
Niobium (Columbium) scrap vacuum del US consumer	See the <a href="#">Argus Metal Prices methodology</a>
Niobium (Columbium) scrap vacuum del US processor	See the <a href="#">Argus Metal Prices methodology</a>
Tantalum scrap 99.9% vacuum melted del US consumer	See the <a href="#">Argus Metal Prices methodology</a>
Tantalum scrap 99.9% vacuum melted del US processor	See the <a href="#">Argus Metal Prices methodology</a>
Tungsten carbide scrap inserts fob US processor	See the <a href="#">Argus Metal Prices methodology</a>
Tungsten carbide scrap rounds fob US processor	See the <a href="#">Argus Metal Prices methodology</a>
Tungsten 99.9% scrap solids consumer price fob US processor	See the <a href="#">Argus Metal Prices methodology</a>
Tungsten 99.9% scrap del US processor	See the <a href="#">Argus Metal Prices methodology</a>



## Ferro-Alloys

### Introduction

Argus Metals International publishes price assessments and market commentary on the international ferro-alloys markets.

### Basis of assessment

Price assessments are for spot physical material for prompt delivery, with cash payment and in lump form unless otherwise stated. Packaging norms are in bags, loose in bulk, in containers or in drums, in line with market convention.

For US in-warehouse prices, the main delivery locations are Baltimore, Pittsburgh, Chicago, Houston and Decatur (Alabama); Portland (Oregon) and Los Angeles, with other warehouse locations also taken into account where appropriate. (See below for further details of ferro-alloy and ore specifications)

Fob China assessments are basis export duty paid, including any export taxes levied by China, and VAT. Fob China prices are not inclusive of any import duty charged by the importing country. China domestic prices are basis ex-works, VAT paid, unless otherwise stated. European prices are basis in-warehouse Rotterdam, duty unpaid unless otherwise stated. Fob US prices in-warehouse are inclusive of duties.

Nickel premiums are spreads to the last LME three-month official price.

Product specifications for each assessment such as currency, unit of trade and quality follow recognised industry standards such as norms published by the Minor Metals Trade Association and other widely used specifications.

Price assessments are published as low-high ranges.

In most cases, information relating to material that falls outside of the stated specifications will not be used in the assessment process. Exceptions may be made if an acceptable and appropriate normalisation process can be applied.

In markets where liquidity is split across several locations, verified spot trades may be normalised to a single reference hub, for example by making adjustments for transportation costs, where appropriate and in line with market practice. (See below for a full list of product specifications.)

### Timing of assessment

European, Indian and Chinese prices are assessed twice weekly, on Tuesday and Thursday, with the exception of cif China manganese ore, which is assessed weekly, on Thursday. US prices are assessed weekly, with the exception of ferro-niobium 65% Nb fob US warehouse and nickel-cobalt refinery scrap nickel contained delivered US processor, which are assessed monthly.

### Rounding

Price assessments are published to two decimal places. Price changes are shown to three decimal places

Bulk alloy and feedstock specifications									
Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment
<b>Ferro-chrome</b>									
Charge Chrome 52% Cr ddp Europe, \$/lb Cr	Chromium 52%	ddp Europe	Duty-free/duty-paid	100t (+/- 2%)	\$/lb	Lump	As per customer specification	Supplier / customer agreed	Quarterly benchmark
HC basis 60% Cr 6-8% C ddp NWE, \$/lb Cr	Chromium 60% minimum, carbon 6-8%, silicon 1.5%, phosphorous 0.05% max, and sulphur 0.06% maximum	ddp NWE	Duty paid	100t (+/- 2%)	\$/lb	Lump	Big bag of 1t, bulk, steel drums	Prompt	Twice weekly
LC min 65% Cr 0.10% C ddp Europe works, \$/lb Cr	Chromium 65% minimum, carbon 0.10%, silicon 1.5%, phosphorous 0.03%, and sulphur 0.03% maximum	ddp Europe works	Duty paid	25t (+/- 2%)	\$/lb	Lump	Big bag of 1t, bulk, steel drums	Prompt	Twice weekly
Charge chrome fob US	See the <a href="#">Argus Metal Prices methodology</a>								
HC min 60-65% Cr 6-8% C fob US warehouse (per lb Cr)	See the <a href="#">Argus Metal Prices methodology</a>								
LC min 60-65% Cr 0.05% C max 1.5% Si fob US warehouse (per lb Cr)	See the <a href="#">Argus Metal Prices methodology</a>								
LC min 60-65% Cr 0.10% C max 1.5% Si fob US warehouse (per lb Cr)	See the <a href="#">Argus Metal Prices methodology</a>								
LC 60% Cr 0.15% C fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
HC 50% Cr ex-works China	Chromium 50% min, carbon 6-8%, silicon 5%, phosphorous 0.04%, and sulphur 0.04% maximum	ex-works China	No	500t	Yn/t	Lump	Big bag of 1t, bulk	Prompt	Twice weekly
HC min 60% Cr ex-works India	Chromium 60% minimum, carbon 6-8%, silicon 5, phosphorous 0.05%, sulphur 0.06% maximum	ex-works India	No	100t	Rs/t	Lump	Big bag of 1t, bulk	Prompt	Twice weekly
Charge Chrome SA 50-55% Cr 6-10% C cif China	Chromium 50-55%, carbon 6-10%, silicon 5%, phosphorous 0.05%, sulphur 0.05% maximum	cif China	Unpaid	> 1,000t	\$/lb	Lump	Big bag of 1t, bulk	Prompt	Twice weekly
HC Indian 60-62% Cr 6-10% C cif China	Chromium 60-62%, carbon 6-10% , silicon 3-4%, phosphorous 0.05% sulphur 0.06% maximum	cif China	Unpaid	> 1,000t	\$/lb	Lump	Big bag of 1t, bulk, producers' steel drums	Prompt	Twice weekly
HC Kazakh 65-70% Cr 6-8% C cif China	Chromium 65-70%, carbon 6-8%, silicon 1.5%, phosphorous 0.05%, sulphur 0.05% maximum	cif China	Unpaid	> 1,000t	\$/lb	Lump	Big bag of 1t, bulk, producers' steel drums	Prompt	Twice weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot Size	Currency/weight	Form	Packaging	Timing	Assesment
<b>Chrome ore</b>									
South African concentrate 44% grade cif China	Chromium2O3 42%-44%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	cif China	Unpaid	5,000t	\$/t	Concentrate	Container	Prompt	Twice weekly
South African concentrate 44% grade fca China	Chromium2O3 42%-44%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	fca China	Unpaid	5,000t	Yn/metric tonne unit	Concentrate	Container	Prompt	Twice weekly
Turkish 42% lump cif China	Chromium2O3 40%-42%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	cif China	Unpaid	1,000t	\$/t	Lump	Container	Prompt	Twice weekly
Turkish 42% lump deq China	Chromium2O3 40%-42%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	deq China	Unpaid	1,000t	Yn/metric tonne unit	Lump	Container	Prompt	Twice weekly
South African UG2 concentrate 40-42% Cr2O3 cif China main ports	Chromium2O3 40%-42%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	cif China	Unpaid	5,000t	\$/t	Concentrate	Container	Prompt	Twice weekly
South African UG2 concentrate 40-42% Cr2O3 fca China main ports	Chromium2O3 40%-42%, phosphorous 0.01%, sulphur 0.01%, MgO + Al2O3 30% maximum	fca China	Unpaid	5,000t	Yn/metric tonne unit	Concentrate	Container	Prompt	Twice weekly
Cr2O3 48%-49.99% OMC price ex-works India	Chromium2O3 48%-49.99%	ex-works India	No	500t	Rs/t	Lump	Container	Prompt	Quarterly benchmark
<b>Ferro-manganese</b>									
HC 78% Mn ddp Europe works	Manganese 78% minimum, carbon 6-8.5%, silicon 1.5%, phosphorous 0.25%, sulphur 0.03-0.05% maximum	ddp Europe	Duty paid	25t (+/- 2%)	€/t	Lump	Big bag of 1t, bulk, producers' steel drums	Prompt	Twice weekly
MC 78% Mn 1.5-2% C ddp Europe works	Manganese 78-85% minimum, carbon 1.5-2%, silicon 2%, phosphorous 0.25%, and sulphur 0.03-0.05% maximum	ddp Europe	Duty paid	25t (+/- 2%)	€/t	Lump	Big bag of 1t, bulk, producers' steel drums	Prompt	Twice weekly
HC min 80% Mn 6-8% C fob North America warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
MC 80% Mn 1-2% C fob North America warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
HC 65% Mn ex-works China	Manganese 65% min, carbon 7%, silicon 2.5-4.5%, phosphorous 0.25-0.4%, sulphur 0.03% max	ex-works China	No	>100t	Yn/t	Lump	Big bag of 1t, bulk	Prompt	Twice weekly
HC 75% Mn fob China	Manganese 75% min, carbon 6-8.5%, silicon 1.5%, phosphorous 0.25%, sulphur 0.03-0.05% maximum	fob China	Export duty paid	>25t	\$/t	Lump	Big bag of 1t, steel drums	Prompt	Twice weekly
HC 75% Mn ex-works China	Manganese 75% minimum, carbon 6-8.5%, silicon 1.5%, phosphorous 0.25%, sulphur 0.03-0.05% maximum	ex-works China	No	>100t	Yn/t	Lump	Big bag of 1t, steel drums	Prompt	Twice weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot Size	Currency/weight	Form	Packaging	Timing	Assesment
HC min 65% Mn ex-works India	Manganese 65% minimum, carbon 8%, silicon 1.5-2%, phosphorous 0.3%, sulphur 0.03% maximum	ex-works India	No	25t (+/- 2%)	Rs/t	Lump	Big bag of 1t, bulk	Prompt	Twice weekly
HC min 70% Mn ex-works India	Manganese 70% min, carbon 6-8.5%, silicon 1.5%, phosphorous 0.25%, sulphur 0.03-0.05% maximum	ex-works India	No	25t (+/- 2%)	Rs/t	Lump	Big bag of 1t, producers' steel drums	Prompt	Twice weekly
<b>Manganese</b>									
Electrolytic metal min 99.7% fob US warehouse, \$/lb	Manganese 99.7%	fob US warehouse	Duty paid	20t (+/- 2%)	\$/lb	Flake	Super sacks	Prompt	Weekly
Ore 44-46% lumpy ore fca China	Manganese 44-46%	fca China	Duty unpaid	1,000t	Yn/metric tonne unit	Lump	Bulk	Prompt	Twice weekly
Ore grade 37% range 36-38% grade cif China	Origin: South Africa, Mn base 37%, range 36-38%, Fe 2-7%, SiO2 7-13%, P 0.02-0.05%	cif main China port, cash paid	Duty unpaid	10,000t	\$/dm tu (dry metric tonne unit)	Lump 5-75mm	Bulk	within six weeks	Weekly
Ore 48-50% grade cif China	Origin: Australia, Mn base 49%, range 48-50%, Fe 2-12%, SiO2 4-10%, P 0.05-0.14%	cif main China port, cash paid	Duty unpaid	5,000t	\$/dm tu (dry metric tonne unit)	Chip 0.5-15mm	Bulk	within six weeks	Weekly
Ore range 44-46% grade cif China	Origin: Australia, Mn base 45%, range 44-46%, Fe 2-12%, SiO2 3-14%, P 0.03-0.13%	cif main China port, cash paid	Duty unpaid	10,000t	\$/dm tu (dry metric tonne unit)	5-75mm	Bulk	within six weeks	Weekly
<b>Silico-manganese</b>									
65% Mn ddp Europe works, €/t	Manganese 65%, silicon 17% minimum, carbon 2%, phosphorous 0.25%, sulphur 0.03% maximum	ddp Europe	Duty paid	100t	€/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
min 65% Mn 16% Si fob North America warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
65% Mn 17% Si fob China	Manganese 65-72%, silicon 17-20%, carbon 1.8%, phosphorous 0.1-0.25%, sulphur 0.04% maximum	fob China	Export duty paid	>25t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
65% Mn 17% Si ex-works China	Manganese 65-72%, silicon 17-20%, carbon 1.8%, phosphorous 0.1-0.25%, sulphur 0.04% maximum	ex-works China	No	>100t	Yn/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
60% Mn 14% Si ex-works India	Manganese 60-65%, silicon 14-17%, carbon 2.5%, phosphorous 0.3%, sulphur 0.04% maximum	ex-works India	No	100t	Rs/t	Lump	Bulk	Prompt	Twice weekly
Silico-manganese 65% Mn 15% Si fob India east coast	Manganese 65-70%, silicon 15-17%, carbon 2.5% phosphorous 0.3%, sulphur 0.03% maximum	fob India east coast	Duty unpaid	100t	\$/t	Lump	Bulk	Prompt	Twice weekly
Silico-manganese 60% Mn 14% Si fob India east coast	Manganese 60-65%, silicon 14-17%, carbon 2.5% phosphorous 0.3% sulphur 0.04% max	fob India east coast	Duty unpaid	100t	\$/t	Lump	Bulk	Prompt	Twice weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot Size	Currency/weight	Form	Packaging	Timing	Assessment
<b>Ferro-silicon</b>									
75% Si ddp NWE	Silicon 75% maximum, aluminium 1.5% minimum	ddp NWE	Duty paid	20-24t / 25t	€/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
min 75% Si max 0.1% C fob US warehouse (per lb Si)	See the <a href="#">Argus Metal Prices methodology</a>								
72% Si fob China	Silicon 72-80%, manganese 0.5%, chromium 0.5%, phosphorous 0.04%, sulphur 0.02%, carbon 0.2% maximum	fob China	Export duty paid	100t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
72% Si ex-works China	Silicon 72-80%, manganese 0.5%, chromium 0.5%, phosphorous 0.04%, sulphur 0.02%, carbon 0.2% maximum	ex-works China	No	>100t	Yn/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
75% Si fob China	Silicon 75% maximum, aluminium 1.5% minimum	fob China	Export duty paid	100t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
75% Si ex-works China	Silicon 75% maximum, aluminium 1.5% minimum	ex-works China	No	>100t	Yn/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
Low aluminium 75% Si 0.1% Al fob China	Silicon 75%, aluminium 0.1%	fob China	Export duty paid	>20t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
Low aluminium 75% Si 0.5% Al fob China	Silicon 75%, aluminium 0.5%	fob China	Export duty paid	>20t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
75% Si ex-works India	Silicon 75% maximum, Al 1.5% minimum	ex-works India	No	20-24t / 25t	Rs/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
<b>Calcium-silicon</b>									
min 28% Ca 55-60% Si fob China	Calcium 28%, silicon 55-60%, carbon 1.2%, aluminium 2.4%, phosphorous 0.04%, sulphur 0.06% maximum	fob China	Export duty paid	20t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
min 28% Ca 55-60% Si ex-works China	Calcium 28%, silicon 55-60%, carbon 1.2%, aluminium 2.4%, phosphorous 0.04%, sulphur 0.06% maximum	ex-works China	No	100t	Yn/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
min 30% Ca 55-60% Si fob China	Calcium 30% minimum, silicon 55-60%, carbon 1.2%, aluminium 2.4%, phosphorous 0.04%, sulphur 0.06% maximum	fob China	Export duty paid	20t	\$/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
min 30% Ca 55-60% Si ex-works China	Calcium 30% minimum, silicon 55-60%, carbon 1.2%, aluminium 2.4%, phosphorous 0.04%, sulphur 0.06% maximum	ex-works China	No	100t	Yn/t	Lump	Big bags of 1t, bulk	Prompt	Twice weekly
<b>Silicon metal</b>									
5-5-3 min 98.5% silicon ddp Europe	Silicon 98.5% minimum, iron 0.5%, aluminium 0.5%, calcium 0.3% maximum	ddp Europe	Duty paid	25t (+/- 2%)	€/t	Lump	Bags of 1t	Prompt	Twice weekly
4-4-1 min 99% silicon ddp Europe	Silicon 99% minimum, iron 0.4%, aluminium 0.4%, calcium 0.1% maximum	ddp Europe	Duty paid	25t (+/- 2%)	€/t	Lump	Bags of 1t	Prompt	Twice weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot Size	Currency/weight	Form	Packaging	Timing	Assesment
5-5-3 min 98.5% silicon ddp US	Silicon 98.5% minimum, iron 0.5%, aluminium 0.5%, calcium 0.3% maximum	ddp US	Duty paid	25t (+/- 2%)	\$/lb	Lump	Bags of 1t	Prompt	Twice weekly
5-5-3 min 98.5% silicon dat Chinese ports	Silicon 98.5% minimum, iron 0.5%, aluminium 0.5%, calcium 0.3% maximum	dat China port	Delivered at terminal	20t	Yn/t	Lump	Bags of 1t	Prompt	Twice weekly
4-4-1 min 99% silicon dat Chinese ports	Silicon 99% minimum, iron 0.4%, aluminium 0.4%, calcium 0.1% maximum	dat China port	Delivered at terminal	20t	Yn/t	Lump	Bags of 1t	Prompt	Twice weekly
5-5-3 min 98.5% silicon fob China	Silicon 98.5% minimum, iron 0.5%, aluminium 0.5%, calcium 0.3% maximum	fob China	Export duty paid	25t (+/- 2%)	\$/t	Lump	Bags of 1t	Prompt	Twice weekly
4-4-1 min 99% silicon fob China	Silicon 99% minimum, iron 0.4%, aluminium 0.4%, calcium 0.1% maximum	fob China	Export duty paid	25t (+/- 2%)	\$/t	Lump	Bags of 1t	Prompt	Twice weekly

**Noble-alloy and feedstock specifications**

Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment
<b>Ferro-boron</b>									
17% B fob warehouse US	See the <a href="#">Argus Metal Prices methodology</a>								
<b>Ferro-molybdenum</b>									
60% Mo du Rotterdam, \$/kg Mo	Molybdenum 60%, carbon 0.1%, silicon 1.5%, phosphorous 0.05%, S 0.1%, copper 0.5%	du Rotterdam	Duty unpaid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
65-70% Mo dp Rotterdam, \$/kg Mo	Molybdenum 65-70%, carbon 0.1%, silicon 1.5%, phosphorous 0.05%, S 0.1%, copper 0.5%, lead 0.05%	dp Europe	Duty paid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
min 65% Mo max 1.5% Si fob North America warehouse (per lb Mo)	See the <a href="#">Argus Metal Prices methodology</a>								
60% Mo fob China	Molybdenum 60%, carbon 0.1%, silicon 1.5%, phosphorous 0.05%, S 0.1%, copper 0.5%	fob China	Export duty paid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
60% Mo ex-works China	Molybdenum 60%, carbon 0.1%, silicon 1.5%, phosphorous 0.05%, S 0.1%, copper 0.5%	ex-works China	No	20-24t (+/- 2%)	Yn/t	Lump	Big bags, drums	Prompt	Twice weekly
60% Mo ex-works India	Molybdenum 60%, carbon 0.1%, silicon 1.5%, phosphorous 0.05%, S 0.1%, copper 0.5%	ex-works India	No	20-24t (+/- 2%)	Rs/kg	Lump	Big bags, drums	Prompt	Twice weekly
<b>Molybdenum oxide / concentrate</b>									
Oxide min 57% Mo du Rotterdam, \$/lb Mo	Molybdenum 57% min, carbon 0.1%, phosphorus 0.05%, S 0.1%, copper 0.5%, lead 0.05% maximum	du Rotterdam	Duty unpaid	10t	\$/lb	Powder	Drums	Prompt	Twice weekly
Oxide min 57% fob US warehouse, \$/lb	Molybdenum 57% minimum, carbon 0.1%, phosphorus 0.05%, S 0.1%, copper 0.5%, lead 0.05% maximum	fob US warehouse	Duty unpaid	20t (+/- 2%)	\$/lb	Powder	Drums, super sacks	Prompt	Weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment
Concentrates Mo 45% ex-works China, Yn/mtu	Molybdenum 45%, SiO2 9%, arsenic 0.1%, tin 0.05%, phosphorous 0.05%, carbon 0.1%, copper 0.05%, lead 0.05%, sulphur 0.1% maximum	ex-works	No	20t	Yn/metric tonne unit	Powder	Drums	Prompt	Twice weekly
<b>Ferro-niobium</b>									
min 65% Nb du Rotterdam, \$/kg Nb	Niobium 65%, aluminium 1-2%, carbon 0.2%, phosphorous 0.15%, sulphur 0.15%, silicon 3%, tantalum 0.5% maximum	du Rotterdam	Duty unpaid	5t (+/- 2%)	\$/kg	Lump	Bags of 1t, drums	Prompt	Twice weekly
65% Nb fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
min 66% Nb Brazilian Imports fca China port	Niobium 66%, aluminium 1-2%, carbon 0.2%, phosphorous 0.15%, sulphur 0.15%, silicon 3%, tantalum 0.5% maximum	fca China	No	5t (+/- 2%)	Yn/t	Lump	Big bags, drums	Prompt	Twice weekly
<b>Ferro-tungsten</b>									
min 75% W du Rotterdam, \$/kg W	Tungsten 75-85% minimum, carbon 1%, silicon 0.6%, phosphorous 0.05%, sulphur 0.05%, manganese 0.6%, arsenic 0.1%, tin 0.1%, copper 0.2%, antimony 0.08%, As+Sb+Sn 0.2% maximum	du Rotterdam	Duty unpaid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
75% W fob North America warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
75% W ex-works China	Tungsten 75% minimum, carbon 0.4%, sulphur 0.8%, manganese 0.5%, arsenic 0.1%, tin 0.08%, phosphorous 0.05%, silicon 0.7%, copper 0.15%, antimony 0.05% maximum	ex-works China	No	10t (+/- 2%)	Yn/t	Lump	Drums	Prompt	Twice weekly
min 75% W fob China	Tungsten 75% minimum, carbon 0.4%, sulphur 0.8%, manganese 0.5%, arsenic 0.1%, tin 0.08%, phosphorous 0.05%, silicon 0.7%, copper 0.15%, antimony 0.05% maximum	fob China	Export duty paid	10t (+/- 2%)	\$/kg	Lump	Drums	Prompt	Twice weekly
<b>Ferro-titanium</b>									
Russian min 70% Ti du Rotterdam, \$/kg Ti	Titanium 70-74% minimum, aluminium 4.5%, vanadium 3%, phosphorous 0.02%, sulphur 0.02%, copper 0.2%, lead 0.05%, carbon 0.2%, silicon 0.25%, nitrogen 0.4%, tin 0.2%, bismuth 0.025%, boron 0.005% maximum	du Rotterdam	Duty unpaid	24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly

Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment
70% Ti dp/duty-free Rotterdam, \$/kg Ti	Titanium 70-72% minimum, aluminium 5%, vanadium 3%, oxygen 2%, carbon 0.15%, sulphur 0.02%, phosphorous 0.02%, nitrogen 0.5%, tin 0.5%, nickel 0.5%, chromium 0.5%, lead 0.01%, bismuth 0.01% maximum	dp/df Rotterdam	Duty-free/duty-paid	10t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
Ferro-titanium 70% Ti fob North America warehouse	See the <a href="#">Argus Metal Prices methodology</a>								
30% Ti ex-works China	Titanium 25-35%, aluminium 8%, silicon 4.5%, arsenic 0.1%, phosphorous 0.05%, sulphur 0.03%, copper 0.2%, manganese 2.5% maximum	ex-works China	No	>10t	Yn/t	Lump	Big bags, drums	Prompt	Twice weekly
70% Ti rutile ex-works China	Titanium 65-75%, aluminium 3%, silicon 0.5%, carbon 0.10%, phosphorous 0.04%, sulphur	ex-works China	No	>10t	Yn/t	Lump	Big bags, drums	Prompt	Twice weekly
<b>Titanium sponge / secondary (scrap)</b>									
Sponge TG-Tv 10x30mm du Rotterdam	Titanium 97.75% minimum, iron 1.9%, nitrogen 0.1% (for reference purposed only carbon 0.1%, chlorine 0.15%)	du Rotterdam	Duty unpaid	10t (+/- 2%)	\$/kg	Lump	Bulk	Prompt	Twice weekly
sponge 99.7% Ti ex-works China	Titanium 99.7% minimum	ex-works China	No	10t	Yn/t	Sponge	Bulk	Prompt	Twice weekly
Sponge 99.6% Ti ex-works China	Titanium 99.6% MHT-110, iron 0.10%, silicon 0.03%, chlorine 0.08%, carbon 0.03%, nitrogen 0.02%, oxygen 0.08%, manganese 0.01%, magnesium 0.07%, hydrogen 0.005% maximum	ex-works China	No	5t (+/- 2%)	Yn/t	Sponge	Bulk	Prompt	Twice weekly
Turnings 90/6/4 max 0.5% Sn ddp UK	Titanium 90/6/4 alloy (Titanium minimum 90%, aluminium 4%, vanadium 6%) tin 0.5% maximum, degreased	ddp UK	Duty paid	20t	\$/lb	Turnings	Bulk	Prompt	Twice weekly
Scrap min 85% min Ti tin-bearing mixed turnings del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap min 85% Ti non-tin-bearing mixed turnings del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap 6Al 4V bulk weldable del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap 6Al 4V clips del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								



Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment
Titanium scrap 6Al 4V turnings aero quality del US dealer/pro- cessor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap grade CP1 solids del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap grade CP2 solids del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
Scrap grade CP3/4 solids del US dealer/processor	See the <a href="#">Argus Metal Prices methodology</a>								
<b>Ferro-vanadium</b>									
78-82% V dp Rotterdam, \$/kg V	Vanadium 78-82% minimum, aluminium 1.5%, silicon 1.5%, manganese 0.5%, carbon 0.3%, sulphur 0.05%, phosphorous 0.06% maximum	dp Rotterdam	Duty paid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
78-82% V max 1.5% Si fob North America warehouse (per lb V)	See the <a href="#">Argus Metal Prices methodology</a>								
50% V ex-works Chinat	Vanadium 50% minimum, aluminium 0.5%, silicon 2%, manganese 0.5%, carbon 0.4%, sulphur 0.04%, phosphorous 0.07% maximum	ex-works	No	10t (+/- 2%)	Yn/t	Lump	Drums	Prompt	Twice weekly
80% V fob China	Vanadium 78-82% minimum, aluminium 1.5%, silicon 1.5%, manganese 0.5%, carbon 0.3%, sulphur 0.05%, phosphorous 0.06% maximum	fob China	Export duty paid	20-24t (+/- 2%)	\$/kg	Lump	Big bags, drums	Prompt	Twice weekly
60% V ex-works India, Rs/kg	Vanadium 60%	ex-works India	No	10t (+/- 2%)	Rs/kg	Lump	Big bags, drums	Prompt	Twice weekly
<b>Vanadium pentoxide</b>									
Fused flake min 98% du Rotterdam, \$/lb V2O5	Vanadium pentoxide 98% minimum, silicon 0.25%, iron 0.3%, sulphur 0.03%, phospho- rous 0.05, arsenic 0.02%, Na2 + K2O 1.5% maximum	du Rotterdam	Duty unpaid	10t (+/- 2%)	\$/lb V2O5	Flake	Drums	Prompt	Twice weekly

Nickel and stainless steel scrap specifications										
Alloy	Grade	Basis	Duties/Tariffs	Lot size	Currency/weight	Form	Packaging	Timing	Assesment	
<b>Nickel</b>										
Cathode 4x4inch premium (small lots) fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
Cathode 4x4inch premium (truck-loads) fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
Cathode 1x1inch premium (small lots) fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
Cathode 1x1inch premium (truck-loads) fob US warehouse	See the <a href="#">Argus Metal Prices methodology</a>									
Cathode full plate premium in-warehouse Rotterdam	See the nickel and zinc specifications table above									
Cathode 4x4inch premium in-warehouse Rotterdam	See the nickel and zinc specifications table above									
Metal 99.9pc Ni ex-warehouse China	Nickel 99.9%, iron 0.5%, carbon 0.1% sulphur 0.02%, phosphorous 0.02% maximum	ex-warehouse, free market	17% Vat	1t	Yn/t	Plate	Bundle	Prompt	Twice weekly	
Ore 1.8pc Ni fca China, Yn/wmt	Nickel 1.8%, moisture 35% maximum		fca China	17% Vat	10,000t	Yn/wet metric tonne	Mud	Bulk	Prompt	Twice weekly
Pig iron 10pc Ni ex-works China, Yn/mtu	Nickel 10% minimum, iron 10-15%, phosphorous 0.8% maximum, sulphur 0.6% maximum		ex-works China	17% Vat	100t	Yn/metric tonne unit	Lump	Big bags	Prompt	Twice weekly
<b>Secondary</b>										
Nickel-Cobalt refinery scrap nickel contained del US processor	See the <a href="#">Argus Metal Prices methodology</a>									
<b>Stainless steel scrap</b>										
Scrap 304 (18-8) scrap solids cif Rotterdam	ISRI Sabot	cif Rotterdam		full container load	\$/lb			30-60 days	Weekly, on day of assessment	
Stainless steel 304 (18-8) scrap solids cif Japan	ISRI Sabot	cif Osaka, Tokyo, Norita		full container load	\$/lb			30-60 days	Weekly, on day of assessment	
Stainless steel 304 (18-8) scrap solids cif South Korea	ISRI Sabot	cif Seoul, Incheon, Busan		full container load	\$/lb			30-60 days	Weekly, on day of assessment	
Stainless steel 304 (18-8) scrap solids cif Taiwan	ISRI Sabot	cif Taipei, Kaohsiung		full container load	\$/lb			30-60 days	Weekly, on day of assessment	
Stainless steel 409/410 scrap solids del US processor	See the <a href="#">Argus Metal Prices methodology</a>									
Stainless steel 430 scrap solids del US processor	See the <a href="#">Argus Metal Prices methodology</a>									

## Rare earths

### Introduction

Argus Metals International publishes price assessments and market commentary on the international rare earths markets.

### Basis of assessment

Rare earths price assessments are for physical material for spot delivery, with "spot" defined as delivery within four weeks. Assessments reflect the average value of spot material across the whole of the day of assessment.

Fob China assessments are basis export duty paid, including any export taxes levied by China. Fob China prices are not inclusive of any import duty charged by the importing country.

China domestic prices are basis ex-works, VAT paid, unless otherwise stated.

European prices are basis in-warehouse Rotterdam, duty unpaid, unless otherwise stated.

Specifications such as currency, unit of trade and quality follow recognised industry standards.

Price assessments are published as low-high ranges.

In most cases, information relating to material that falls outside of the stated specifications will not be used in the assessment process. Exceptions may be made if an acceptable and appropriate normalisation process can be applied.

### Timing of assessment

Chinese domestic and export prices are assessed twice a week, on Tuesdays and Thursdays. European delivered prices are assessed once a week, on Thursdays, owing to lower liquidity in that market.

Price assessments are compiled by 6pm UK time and published by 8pm UK time.

### Rounding

Prices are assessed to two decimal places in either yuan/t (Yn/t), yuan/kg (Yn/kg) or in US dollars/kg (\$/kg).

**Rare earths specifications**
**China export and delivered Europe**

Element	Currency/unit
<b>Cerium</b>	
Carbonate 45% REO fob China	\$/kg
Metal 99% min fob China	\$/kg
Oxide 99.5-99.9% fob China	\$/t
Oxide 99.5-99.9% cif Europe	\$/kg
<b>Dysprosium</b>	
Metal 99% min fob China	\$/kg
Oxide 99.5% min fob China	\$/kg
Oxide 99.5% min cif Europe	\$/kg
<b>Europium</b>	
Metal 99.9% min fob China	\$/kg
Oxide 99.99% min fob China	\$/kg
<b>Erbium</b>	
Oxide 99.5% cif Europe	\$/kg
<b>Ferro-dysprosium</b>	
Dy 80% min fob China	\$/kg
<b>Ferro-gadolinium</b>	
Gd 75% min ex-works China	Yn/t
<b>Gadolinium</b>	
Metal 99% min fob China	\$/kg
Oxide 99.999% min fob China	\$/t
<b>Lanthanum</b>	
Metal 99% min fob China	\$/kg
Oxide 99.5-99.9% fob China	\$/t
Oxide 99.999% min fob China	\$/kg
<b>Mischmetal</b>	
La 35% Ce 65% fob China	\$/kg
Low Zn and Mg fob China	\$/kg
<b>Neodymium</b>	
Metal 99% min fob China	\$/kg
Oxide 99.5-99.9% fob China	\$/t
Metal 99% cif Europe	\$/kg
Nd Oxide 99.5-99.9% cif Europe	\$/kg
<b>Praseodymium</b>	
Metal 99% min fob China	\$/kg
Oxide 99.5-99.9% fob China	\$/t
<b>Praseodymium-neodymium</b>	
Metal 99% min fob China	\$/kg
Oxide 99% min fob China	\$/t
<b>Samarium</b>	
Metal 99% min fob China	\$/kg
Oxide 99.5% min fob China	\$/kg
<b>Terbium</b>	
Metal 99.9% min fob China	\$/kg
Oxide 99.99% min fob China	\$/kg
Oxide 99.99% min cif Europe	\$/kg
<b>Yttrium</b>	
Metal 99.9% min fob China	\$/kg

**China domestic ex-works**

Oxide 99.999% min fob China	\$/t
Oxide 99.999% Europe	\$/kg
<b>Element</b>	
<b>Cerium</b>	
Carbonate 45% REO China	Yn/t
Metal 99% min China	Yn/t
Oxide 99.5-99.9% China	Yn/t
<b>Dysprosium</b>	
Oxide 99.5% min China	Yn/kg
Metal 99% min China	Yn/kg
<b>Erbium</b>	
Oxide 99.5% min China	Yn/t
<b>Europium</b>	
Oxide 99.99% min China	Yn/kg
<b>Ferro-dysprosium</b>	
Dy 80% min EXW	Yn/kg
<b>Gadolinium</b>	
Metal 99% min China	Yn/t
Oxide 99.5-99.9% min China	Yn/t
<b>Lanthanum</b>	
Metal 99% min China	Yn/t
Oxide 99.5-99.9% China	Yn/t
Oxide 99.999% min China	Yn/t
Lanthanum cerium chloride min 45% REO	Yn/t
<b>Mischmetal</b>	
La 35% Ce 65% China	Yn/t
Low Zn and Mg China	Yn/t
<b>Neodymium</b>	
Metal 99% min China	Yn/t
Oxide 99.5-99.9% China	Yn/t
<b>Praseodymium</b>	
Metal 99% min China	Yn/t
Oxide 99.5-99.9% China	Yn/t
<b>Praseodymium-neodymium</b>	
Metal 99% min China	Yn/t
Oxide 99% min China	Yn/t
<b>Samarium</b>	
Metal 99% min China	Yn/t
Oxide 99.5% min China	Yn/t
<b>Terbium</b>	
Metal 99.9% min China	Yn/kg
Oxide 99.99% min China	Yn/kg
<b>Yttrium</b>	
Metal 99.9% min China	Yn/kg
Oxide 99.999% min China	Yn/t