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## **ARGUS MINOR METALS**

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

## Methodology rationale

Argus strives to construct methodologies that reflect the way markets trade. 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.

### 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. 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.

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 where the product deviates from the material specification for the published price assessment, such as metal content and other elements, or the specified physical form of the product.
- Transactions that are based on a formula using a discount or premium to a published price agreed between buyer and seller.
- Transactions where the delivery point and/or delivery terms vary from those specified in the published price specifications.
- Transactions not transacted at arms 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 dif-

ferently 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:**

- 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 judgment 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 judgment 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 judgment significantly narrows the band within which a commodity can be as-

sessed, and greatly increases the accuracy and consistency of the price series. The application of judgment 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 judgment.

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 judgment in the price assessment process.

### 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 judgment 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 judgment
- 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 judgment for illiquid markets.
- Editors are required to sign-off on all price assessments each day, thus ensuring the consistent application of judgment.

### 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 to 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 methodologies. 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 the 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 Minor Metals

Argus Minor Metals provides price assessments spanning the European, US and Asian spot markets. Price assessments are published on the Argus Direct web platform, as FTP data feeds and in the Argus Minor Metals weekly pdf report.

### Average price indexes

In addition to outright prices, the service also provides month to date and final monthly-average indexes for all prices except domestic China prices. 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 weekly pdf report shows the evolution of the current month index, as well the final index value for the previous month.

### News, analysis and fundamental data

In addition to price assessments, Argus Minor Metals provides market-relevant news and analysis, detailed market commentary, data on market fundamentals, price charting tools and price history. The service is produced by specialist metals market reporters and editors in China, India, Brazil, the US, the UK and South Africa.

### Assessment period and timing

Price assessments are published twice weekly, on Tuesdays and Thursdays, or once a week on Fridays. Twice-weekly assessments are finalised by 6pm London time. Weekly assessments are finalised by 5pm US eastern time.

Assessments take into account information gathered during the period between finalisation of the previous assessment and finalisation of the current assessment. So a twice-weekly assessment published on Tuesday takes into account information gathered between 6pm on the previous Thursday and 6pm on the current Tuesday.

### Assessment process

For assessment purposes only verified spot market transactions that are considered repeatable are taken into account. Transactions involving unusual terms or non-standard specifications or grades will be excluded from the assessment process. So prices derived from term contracts involving, for example, monthly deliveries are not included as they may contain terms and conditions specific to that contract such as fixed prices or premiums and discounts to the spot market price. (See previous section on verification of trade data.)

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. We strongly encourage full disclosure of all relevant details of all deals concluded. All information received will be cross-checked and tested against other market information. Any anomalies will be 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. (See previous section on transaction data).

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. For example, in an oversupplied or balanced market, a larger volume transaction would often take place in a lower price range than small volume transactions. In a tightly supplied market, a higher volume transaction can command a premium price, compared with transactions for smaller volumes. These pricing dynamics are reflected in the published price range.

### 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.

## Specifications

Minor metal 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, to two decimal places where appropriate, and in the currency relevant to each specific market.

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.

### Antimony

#### Antimony ingot min 99.65% ex-works China, Yn/t

Grade: antimony 99.65% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 10t (+/-2%)  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### Antimony ingot min 99.65% fob China, USD/t

Grade: antimony 99.65% minimum  
 Basis: free on board China, per tonne of material  
 Location: China main ports  
 Duties/tariffs: export duty paid  
 Minimum lot size: 10t (+/-2%)  
 Form: ingots  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### Antimony min 99.65% cif US

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### Antimony Regulus Grade II min 99.65% Sb du Rotterdam, USD/t

Grade: antimony 99.65% minimum; arsenic 0.15%, selenium 0.005%, and sulphur 0.06% maximum  
 Basis: duty unpaid in-warehouse Rotterdam, per tonne of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 10t (+/-2%)  
 Form: ingots (regulus)  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### Antimony Regulus Trioxide grade min 99.65% Sb du Rotterdam, USD/t

Grade: 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  
 Basis: duty unpaid in-warehouse Rotterdam, per tonne of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 10t (+/-2%)  
 Form: ingots (regulus)  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### Antimony trioxide min 99.5% ex-works China, Yn/t

Grade: antimony 99.5% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 10t (+/-2%)  
 Form: ingots  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### Antimony trioxide min 99.5% fob China, USD/t

Grade: antimony 99.5% minimum  
 Basis: free on board China, per tonne of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Minimum lot size: 25t (+/-2%)  
 Form: ingots  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

## Arsenic

### Arsenic min 99% du Rotterdam, USD/lb

Grade: arsenic 99% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 1t (+/-2%)  
 Form: lumpy -- fist size and downwards  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

### Arsenic min 99% fob US warehouse

See the [MetalPrices.com](http://MetalPrices.com) methodology.

## Bismuth

### Bismuth min 99.99% du Rotterdam, USD/lb

Grade: bismuth 99.99% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 1t (+/-2%)  
 Form: ingots  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

### Bismuth min 99.99% ex-works China, Yn/t

Grade: bismuth 99.99% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 1t (+/-2%)  
 Form: ingots  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

### Bismuth min 99.99% fob China, USD/lb

Grade: bismuth 99.99% minimum  
 Basis: fob China, per pound of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Minimum lot size: 1t (+/-2%)  
 Form: ingots  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

### Bismuth ingot min 99.99% fob US warehouse

See the [MetalPrices.com](http://MetalPrices.com) methodology.

## Cadmium

### Cadmium min 99.99% du Rotterdam, USD/lb

Grade: cadmium 99.99% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

### Cadmium min 99.99% ex-works China, YN/t

Grade: cadmium 99.99% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

### Cadmium min 99.99% cif India, INR/kg

Grade: cadmium 99.99% minimum  
 Basis: cost, insurance and freight India, per kilogram of material  
 Location: India  
 Duties/tariffs: duty paid  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: Indian rupees  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

### Cadmium min 99.99% fob US warehouse

See the [MetalPrices.com](http://MetalPrices.com) methodology.

### Cadmium min 99.95% cif India, INR/kg

Grade: cadmium 99.95% minimum  
 Basis: cost, insurance and freight India, per kilogram of material  
 Location: India  
 Duties/tariffs: duty paid  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: Indian rupees  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

### Cadmium min 99.95% du Rotterdam, USD/lb

Grade: cadmium 99.95% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam

Duties/tariffs: duty unpaid  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

#### **Cadmium min 99.95% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### **Cadmium oxide min 99.5% ex-works China, Yn/t**

Grade: cadmium 99.5% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 5t (+/- 2%)  
 Form: sticks, ingots or balls  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

### **Chromium**

#### **Chromium (alumino-thermic) min 99% du Rotterdam, USD/t**

Grade: chromium 99% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per tonne of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 10t (+/- 2%)  
 Form: lumps  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Chromium (alumino-thermic) min 99% Cr ex-works China, Yn/t**

Grade: chromium 99% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 10t (+/- 2%)  
 Form: lumps  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

### **Cobalt**

#### **Cobalt min 99.8% alloy grade du Rotterdam, USD/lb**

Grade: cobalt 99.8% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 1t (+/- 2%)

Form: cut cathode, rounds  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

#### **Cobalt (electrolytic metal) min 99.8% ex-works China, Yn/kg**

Grade: cobalt 99.8% minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 1t (+/- 2%)  
 Form: cut cathode  
 Currency: Chinese yuan  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

#### **Cobalt min 99.8% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### **Cobalt min 99.6% chemical grade du Rotterdam, USD/lb**

Grade: cobalt 99.6% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 1t (+/- 2%)  
 Form: broken cathode, briquettes  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

#### **Cobalt min 99.3% Russian grade du Rotterdam, USD/lb**

Grade: cobalt 99.3% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per pound of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 1t (+/- 2%)  
 Form: ingots, normally not to exceed 15kg, cut cathode  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: twice weekly

#### **Cobalt min 99.3% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### **Cobalt chloride min 24% ex-works China, Yn/t**

Grade: cobalt 24% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 1t (+/- 2%)  
 Form: powder  
 Currency: Chinese yuan  
 Weight: tonnes



Timing: prompt  
Assessment: twice weekly

**Cobalt oxide 72% ex-works China, Yn/kg**

Grade: cobalt 72% minimum  
Basis: ex works China, per kilogram of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 1t (+/- 2%)  
Form: powder  
Currency: Chinese yuan  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Cobalt powder min 99.8% ex-works China, Yn/kg**

Grade: cobalt 99.8% minimum  
Basis: ex works China, per kilogram of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 1t (+/- 2%)  
Form: powder  
Currency: Chinese yuan  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Cobalt sulphate min 20% ex-works China, Yn/t**

Grade: cobalt 20% minimum  
Basis: ex works China, per tonne of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 1t (+/- 2%)  
Form: powder  
Currency: Chinese yuan  
Weight: tonnes  
Timing: prompt  
Assessment: twice weekly

**Cobalt tetroxide min 73% ex-works China, Yn/kg**

Grade: cobalt 73% minimum  
Basis: ex works China, per kilogram of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 1t (+/- 2%)  
Form: powder  
Currency: Chinese yuan  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Gallium**

**Gallium min 99.99% cif main airport, USD/kg**

Grade: gallium 99.99% minimum  
Basis: cost, insurance and freight main airport, per kilogram of material  
Location: Europe  
Duties/tariffs: duty paid  
Minimum lot size: 50kg (+/- 2%)  
Form: ingots  
Currency: US dollar  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Gallium min 99.99% ex-works China, Yn/kg**

Grade: gallium 99.99% minimum  
Basis: ex works China, per kilogram of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 50kg (+/- 2%)  
Form: ingots  
Currency: Chinese yuan  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Gallium min 99.99% fob China, USD/kg**

Grade: gallium 99.99% minimum  
Basis: free on board China, per kilogram of material  
Location: China  
Duties/tariffs: export duty paid  
Minimum lot size: 50kg (+/- 2%)  
Form: ingots  
Currency: US dollars  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Gallium min 99.9999% ex-works China, Yn/kg**

Grade: gallium 99.9999% minimum  
Basis: ex works China, per kilogram of material  
Location: China  
Duties/tariffs: no  
Minimum lot size: 50kg (+/- 2%)  
Form: ingots  
Currency: Chinese yuan  
Weight: kilograms  
Timing: prompt  
Assessment: twice weekly

**Germanium**

**Germanium dioxide min 99.99% du Rotterdam, USD/kg**

Grade: germanium dioxide 99.99% minimum; germanium 69% approximately  
Basis: duty unpaid in-warehouse Rotterdam, per kilogram of material

Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: white powder  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Germanium metal min 99.99% cif main airport, USD/kg**

Grade: germanium 99.99% minimum  
 Basis: cost, insurance, freight main airport, per kilogram of material  
 Location: Europe  
 Duties/tariffs: duty paid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots, typically 1-5kg each  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Germanium dioxide min 99.999% ex-works China, Yn/kg**

Grade: germanium dioxide 99.999% minimum; germanium 69% approximately  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 50kg (+/- 2%)  
 Form: white powder  
 Currency: Chinese yuan  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Germanium dioxide min 99.999% fob China, USD/kg**

Grade: germanium dioxide 99.999% minimum; germanium 69% approximately  
 Basis: free on board China, per kilogram of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: white powder  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Germanium metal (zone refined ingot) min 99.999% ex-works China, Yn/kg**

Grade: germanium 99.999% minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots  
 Currency: Chinese yuan  
 Weight: kilograms

Timing: prompt  
 Assessment: twice weekly

**Germanium min 99.999% fob China, USD/kg**

Grade: germanium 99.999% minimum  
 Basis: free on board China, per kilogram of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Hafnium**

**Hafnium min 99% du Rotterdam, USD/kg**

Grade: 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  
 Basis: duty unpaid in-warehouse Rotterdam, per kilogram of material  
 Location: Rotterdam  
 Duties/tariffs: no  
 Minimum lot size: 100t  
 Form: Uniform pieces of max 3kg (excluding sponge) in drums or cases  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Indium**

**Indium min 99.99% du Rotterdam, USD/kg**

Grade: indium 99.99% minimum  
 Basis: duty unpaid in-warehouse Rotterdam, per kilogram of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots, usually 0.5-3.5kg, occasionally 10kg  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

**Indium min 99.99% ex-works China, Yn/kg**

Grade: indium 99.99% minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots, usually 0.5-3.5kg, occasionally 10kg  
 Currency: Chinese yuan  
 Weight: kilograms

Timing: prompt  
 Assessment: twice weekly

#### **Indium min 99.99% fob China, USD/kg**

Grade: indium 99.99% minimum  
 Basis: free on board China, per kilogram of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots, usually 0.5-3.5kg, occasionally 10kg  
 Currency: US dollars  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

#### **Indium Ingot min 99.99% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### **Indium min 99% ex-works China, Yn/kg**

Grade: indium 99% minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 50kg (+/- 2%)  
 Form: ingots, usually 0.5-3.5kg, occasionally 10kg  
 Currency: Chinese yuan  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

### **Lithium**

#### **Lithium carbonate 99.5% ex-works China, Yn/t**

Grade: lithium carbonate 99.5pc minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: 17pc VAT  
 Minimum lot size: 1t  
 Currency: Chinese yuan  
 Weight: tonnes  
 Form: powder, packaged in barrel/bag  
 Timing: prompt  
 Assessment: twice weekly

#### **Lithium cobalt oxide min 60% Co ex-works China, Yn/kg**

Grade: cobalt 60% minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 100kg  
 Form: powder  
 Currency: Chinese yuan  
 Weight: kilograms  
 Timing: prompt  
 Assessment: twice weekly

#### **Lithium hydroxide 56.5% ex-works China, Yn/t**

Grade: lithium hydroxide monohydrate 56.5pc minimum  
 Basis: ex works China, per kilogram of material  
 Location: China  
 Duties/tariffs: 17pc VAT  
 Minimum lot size: 1t  
 Currency: Chinese yuan  
 Weight: tonnes  
 Form: powder, packaged in barrel/bag  
 Timing: prompt  
 Assessment: twice weekly

### **Magnesium**

#### **Magnesium min 99.9% du Rotterdam, USD/t**

Grade: 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  
 Basis: duty unpaid in-warehouse Rotterdam, per tonne of material  
 Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 20t (+/- 2%)  
 Form: ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Magnesium min 99.9% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

#### **Magnesium alloy min 90% Mg AZ91 ex-works China, Yn/t**

Grade: magnesium 90% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 20t (+/- 2%)  
 Form: ingot  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Magnesium alloy min 90% Mg AZ91 ex-works China, Yn/t**

Grade: magnesium 90% minimum, aluminium 9% maximum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 20t (+/- 2%)  
 Form: ingot  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

**Magnesium min 99.9% ex-works China, Yn/t**

Grade: 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

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 20t (+/- 2%)

Form: ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Magnesium min 99.9% fob China, USD/t**

Grade: 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

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 20t (+/- 2%)

Form: ingots, free from oxidation - surface condition to be specified - each 8kg (+/- 1kg), (Chinese 7kg (+/- 0.5kg)) of uniform size and weight

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Magnesium powder 99.9% Mg 20-80 mesh ex-works China, Yn/t**

Grade: magnesium 99.9% minimum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 20t (+/- 2%)

Form: powder

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Magnesium powder 99.9% Mg 20-80 mesh fob China, USD/t**

Grade: magnesium 99.9% minimum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 20t (+/- 2%)

Form: powder

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Manganese**
**Manganese briquette min 97% Mn ex works China, Yn/t**

Grade: manganese 97pc minimum

Basis: ex works

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 10t

Form: briquette

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Manganese briquette 97% Mn fob China, USD/t**

Grade: manganese 97% minimum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 25t (+/- 2%)

Form: briquettes

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Manganese electrolytic metal min 99.7% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

**Manganese flake min 99.7% du Rotterdam, USD/t**

Grade: manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum

Basis: duty unpaid in-warehouse Rotterdam, per tonne of material

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 25t (+/- 2%)

Form: flakes

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Manganese flake 99.7% Mn ex-works China, Yn/t**

Grade: manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 25t (+/- 2%)

Form: flakes

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Manganese flake min 99.7% fob China, USD/t

Grade: manganese 99.7% minimum; carbon 0.04%, phosphorus 0.005%, sulphur 0.05%, and iron + selenium + silicon 0.205% maximum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 25t (+/- 2%)

Form: flakes

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: weekly

### Manganese lump min 95% Mn ex works China, Yn/t

Grade: manganese 95% minimum

Basis: ex works

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 10t

Form: lump

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Manganese lump 95% Mn fob China, USD/t

Grade: manganese 95% minimum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 25t (+/- 2%)

Form: lumps

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Mercury

#### Mercury min 99.99% du Rotterdam, USD/flask

Grade: mercury 99.99% minimum

Basis: duty unpaid in-warehouse Rotterdam, per flask

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 50 flasks each containing 34.5kg net, with zero tolerance (+/- 0%)

Form: free flowing liquid

Currency: US dollars

Weight: flask

Timing: prompt

Assessment: twice weekly

### Molybdenum

#### Molybdenum oxide min 57% Mo du Rotterdam (per lb of Mo), USD/lb

Grade: molybdenum 57% minimum; carbon 0.1%, phosphorus 0.05%, sulphur 0.1%, copper 0.5%, and lead 0.05% maximum

Basis: duty unpaid in-warehouse Rotterdam, per pound of molybdenum

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 10t

Form: powder 0-4mm, packaged in drums 250/400kg each

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: twice weekly

#### Molybdenum oxide min 57% fob US warehouse

See the [MetalPrices.com](http://MetalPrices.com) methodology.

### Niobium

#### Niobium pentoxide min 99.5% ex works China, Yn/kg

Grade: niobium pentoxide 99.5% minimum

Basis: ex works China, per kilogram of material

Origin: China

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 1t

Form: powder

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

### Rhenium

#### Rhenium ammonium perrhenate (APR) min 69.2% Re (basic grade) du Rotterdam (per kg of Re), USD/kg

Grade: 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

Basis: duty unpaid in-warehouse Rotterdam, per kilogram of rhenium

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 100kg material (+/- 2%)

Form: white free flowing powder/crystals

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Rhenium ammonium perrhenate (APR) min 69.4% Re (catalyst grade) dp Rotterdam (per kg of Re), USD/kg**

Grade: 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

Basis: duty paid in-warehouse Rotterdam, per kilogram of rhenium

Location: Rotterdam

Duties/tariffs: duty paid

Minimum lot size: 20kg material (+/- 2%)

Form: white free flowing powder/crystals

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Rhenium pellets min 99.9% Re dp Rotterdam, USD/lb**

Grade: rhenium 99.9% minimum

Basis: duty paid in-warehouse Rotterdam, per pound of material

Location: Rotterdam

Duties/tariffs: duty paid

Minimum lot size: 50kg

Form: pellets

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: twice weekly

**Rhenium ammonium perrhenate (APR) min 69.4% Re ex-works China, Yn/kg**

Grade: rhenium 69.4% minimum

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: no

Minimum lot size: 100kg material (+/- 2%)

Form: white free flowing powder/crystals

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Rutile**
**Hainan rutile min 90% TiO<sub>2</sub> ex-works China, Yn/t**

Grade: titanium dioxide minimum 90%, phosphorus maximum 0.03%, sulphur maximum 0.03%

Basis: ex works excluding VAT

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 100t

Form: sand

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Australian rutile min 95% TiO<sub>2</sub> ex-works China, Yn/t**

Grade: titanium dioxide minimum 95%, phosphorus maximum 0.03%, sulphur maximum 0.03%

Basis: ex works excluding VAT

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 100t

Form: sand

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Selenium**
**Selenium min 99.5% du Rotterdam, USD/lb**

Grade: selenium 99.5% minimum

Basis: duty unpaid in-warehouse Rotterdam, per pound of material

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 250kg (+/- 2%)

Form: powder of -200 mesh or granules sizing 1-5mm

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: twice weekly

**Selenium min 99.5% fob US warehouse**

See the [MetalPrices.com](http://MetalPrices.com) methodology.

**Selenium dioxide min 99% ex-works China, Yn/kg**

Grade: selenium 99% minimum

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: no

Minimum lot size: 250kg (+/- 2%)

Form: powder

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Selenium powder min 99.9% ex-works China, Yn/kg**

Grade: selenium 99.9% minimum

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: no

Minimum lot size: 250kg (+/- 2%)

Form: powder - 200 mesh or granules sizing 1-5mm

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

## Silicon

### Silicon 4-4-1 min 99% Si ddp Europe works, Euro/t

Grade: silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum

Basis: delivered duty paid Europe, per tonne of material

Location: Europe

Duties/tariffs: duty paid

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: euros

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 5-5-3 min 98.5% Si ddp Europe works, Euro/t

Grade: silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum

Basis: delivered duty paid Europe, per tonne of material

Location: Europe

Duties/tariffs: duty paid

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: euros

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 5-5-3 min 98.5% Si fob US warehouse

See the [MetalPrices.com](http://MetalPrices.com) methodology.

### Silicon 4-4-1 min 99% Si dat Chinese ports, Yn/t

Grade: silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum

Basis: delivered at terminal Chinese ports, per tonne of material

Location: China

Duties/tariffs: delivered at terminal

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 5-5-3 min 98.5% Si dat Chinese ports, Yn/t

Grade: silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum

Basis: delivered at terminal Chinese ports, per tonne of material

Location: China

Duties/tariffs: delivered at terminal

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 4-4-1 min 99% Si fob China, USD/t

Grade: silicon 99% minimum; iron 0.4%, aluminium 0.4%, and calcium 0.1% maximum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 5-5-3 min 98.5% Si fob China, USD/t

Grade: silicon 98.5% minimum; iron 0.5%, aluminium 0.5%, and calcium 0.3% maximum

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 25t (+/- 2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 2-2-0-2 min 99.5% Si fca Europe, Euro/t

Grade: silicon 99.5% minimum; iron 0.2%, aluminium 0.2%, calcium 0.02% maximum

Basis: free on truck (fca), per tonne of material

Location: Europe

Duties/tariffs: duty paid

Minimum lot size: 25t

Form: lumps, in range 10-100mm, 90% minimum

Currency: euros

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Silicon 3-3-0-3 min 99% Si fca Europe, Euro/t

Grade: silicon 99% minimum; iron 0.3%, aluminium 0.3%, calcium 0.03% maximum

Basis: free on truck (fca), per tonne of material

Location: Europe

Duties/tariffs: duty paid

Minimum lot size: 25t (+/-2%)

Form: lumps, in range 10-100mm, 90% minimum

Currency: euros

Weight: tonnes

Timing: prompt

Assessment: twice weekly

## Tantalum

### Tantalite basis 30% Ta<sub>2</sub>O<sub>5</sub> du Rotterdam (per lb of Ta<sub>2</sub>O<sub>5</sub>), USD/lb

Grade: 30% tantalum pentoxide, thorium dioxide + triuranium octoxide 0.5% maximum

Basis: duty unpaid in-warehouse Rotterdam, per pound of Ta<sub>2</sub>O<sub>5</sub>

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 10t

Form: lump concentrate

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: twice weekly

### Tantalum min 99.8% du Rotterdam, USD/kg

Grade: 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

Basis: duty unpaid in-warehouse Rotterdam, per kilogram of material

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 500kg (+/- 2%)

Form: uniform bars/rods/ingot or 4" (10cm)

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

### Tantalum pentoxide min 99.5% ex-works China, Yn/kg

Grade: tantalum pentoxide 99.5% minimum

Basis: ex works China, per kilogram of material

Origin: China

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 1t

Form: powder

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

## Tellurium

### Tellurium min 99.99% du Rotterdam, USD/kg

Grade: tellurium 99.99% maximum

Basis: duty unpaid in-warehouse Rotterdam, per kilogram of material

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 100kg (+/- 2%)

Form: ingots, sticks or powder

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

### Tellurium 99.99% ex-works China, Yn/kg

Grade: tellurium 99.99% minimum

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: no

Minimum lot size: 500kg (+/- 2%)

Form: ingots, sticks or powder

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

### Tellurium min 99.95% fob US

See the [MetalPrices.com](http://MetalPrices.com) methodology.

## Titanium

### Titanium ingot min 99% Ti pure TA1 ex-works China, Yn/t

Grade: titanium 99% minimum, iron 0.25%, carbon 0.10%, nitrogen 0.03%, oxygen 0.20%, and hydrogen 0.015%

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 2t

Form: ingots

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Titanium ingot min 99% Ti pure TA2 ex-works China, Yn/t

Grade: titanium 99% minimum, iron 0.30%, carbon 0.10%, nitrogen 0.05%, oxygen 0.25%, and hydrogen 0.015%

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 2t

Form: ingots

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

### Titanium ingot min 99% Ti pure TA3 ex-works China, Yn/t

Grade: titanium 99% minimum, iron 0.40%, carbon 0.10%, nitrogen 0.05%, oxygen 0.30%, and hydrogen 0.015%

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 2t

Form: ingots

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly



**Titanium concentrate 46% TiO<sub>2</sub> ex-works China (VAT unpaid), Yn/t**

Grade: titanium oxide 46% minimum, lead 0.30% maximum, sulphur 0.05% maximum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: VAT unpaid

Minimum lot size: 50t

Form: lump

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium concentrate 50% TiO<sub>2</sub> ex-works China (VAT unpaid), Yn/t**

Grade: titanium oxide 50% minimum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: VAT unpaid

Minimum lot size: 50t

Form: sand

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium slag min 92% TiO<sub>2</sub> ex-works China, Yn/t**

Grade: titanium dioxide 92% minimum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 50t

Form: sand

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium sponge 99.6% Ti ex-works China, Yn/t**

Grade: 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

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 5t

Form: sponge 0.83mm-12.7mm 90% minimum

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium sponge 99.7% Ti ex-works China, Yn/t**

Grade: titanium 99.7% minimum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 10t

Form: sponge

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium sponge TG-TV 10x30mm du Rotterdam, USD/kg**

Grade: titanium 97.75% minimum; iron 1.9% and nitrogen 0.10% maximum

For reference purposes only – carbon 0.1% and chlorine 0.15% maximum

Basis: duty unpaid Rotterdam, per kilogram of material

Origin: in seller's option

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 10mt (+/- 2%)

Form: sponge lumps in range 10-30mm

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Titanium tetrachloride min 99.9% TiCl<sub>4</sub> ex-works China, Yn/t**

Grade: Titanium tetrachloride 99.96% minimum, silicon tetrachloride 0.01% maximum, vanadium oxytrichloride%, 0.0012% maximum, FeCl<sub>3</sub> 0.001 maximum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 1t

Form: liquid, in steel drum

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Titanium scrap 6Al 4V bulk weldable fob US, USD/lb**

Basis: free on board US processor, per pound of material

Location: US

Duties/tariffs: duty paid

Minimum lot size: 1,000lbs

Form: heavy solids

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: weekly

**Titanium scrap 6Al 4V clips fob US, USD/lb**

Basis: free on board US processor, per pound of material

Location: US

Duties/tariffs: duty paid

Minimum lot size: 3,000lbs

Form: clips

Currency: US dollars

Weight: pounds  
 Timing: prompt  
 Assessment: weekly

#### **Titanium scrap grades 1 CP Ti solids fob US, USD/lb**

Basis: free on board US processor, per pound of material  
 Location: US  
 Duties/tariffs: duty paid  
 Minimum lot size: 3,000lbs  
 Form: solids  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: weekly

#### **Titanium scrap grades 2 CP Ti solids fob US, USD/lb**

Basis: free on board US processor, per pound of material  
 Location: US  
 Duties/tariffs: duty paid  
 Minimum lot size: 3,000lbs  
 Form: solids  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: weekly

#### **Titanium scrap grades 3-4 CP Ti solids fob US, USD/lb**

Basis: free on board US processor, per pound of material  
 Location: US  
 Duties/tariffs: duty paid  
 Minimum lot size: 3,000lbs  
 Form: solids  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: weekly

#### **Titanium scrap turnings 6Al 4V aero quality fob US, USD/lb**

Basis: free on board US processor, per pound of material  
 Location: US  
 Duties/tariffs: duty paid  
 Minimum lot size: 3,000lbs  
 Form: turnings  
 Currency: US dollars  
 Weight: pounds  
 Timing: prompt  
 Assessment: weekly

## **Tungsten**

#### **Tungsten ammonium paratungstate (APT) du Rotterdam (per mtu of WO<sub>3</sub>), USD/mtu**

Grade: 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  
 Basis: duty unpaid in-warehouse Rotterdam, per metric ton unit of tungsten trioxide

Location: Rotterdam  
 Duties/tariffs: duty unpaid  
 Minimum lot size: 18t (+/- 2%)  
 Form: white finely divided free-flowing crystals  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Tungsten concentrates min 65% ex-works China, Yn/t**

Grade: tungsten 65% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 5t  
 Form: lump concentrate  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Tungsten oxide min 99.95% ex-works China, Yn/t**

Grade: tungsten trioxide purity 99.95% minimum  
 Basis: ex works China, per tonne of material  
 Location: China  
 Duties/tariffs: no  
 Minimum lot size: 1t  
 Form: powder, in drums  
 Currency: Chinese yuan  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Tungsten oxide (Yellow/Blue oxide) fob china, USD/t**

Grade: tungsten trioxide purity 99.95% minimum  
 Basis: free on board China, per tonne of material  
 Location: China  
 Duties/tariffs: export duty paid  
 Form: powder, drummed  
 Minimum lot size: 10t  
 Currency: US dollars  
 Weight: tonnes  
 Timing: prompt  
 Assessment: twice weekly

#### **Tungsten ammonium paratungstate (APT) min 88.5% ex-works China, Yn/t**

Grade: 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

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 10t (+/- 2%)

Form: white finely divided free-flowing crystals

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

#### **Tungsten ammonium paratungstate (APT) fob China, USD/mtu**

Grade: 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

Basis: free on board China, per metric ton unit of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 18t (+/- 2%)

Form: white finely divided free-flowing crystals

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

#### **Tungsten carbide min 99.7% ex-works China, Yn/kg**

Grade: tungsten 99.7% minimum

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: no

Minimum lot size: 5t

Form: powder – fraction size 1-10 microns

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

#### **Tungsten carbide powder (3-4micron) fob China, USD/kg**

Grade: tungsten 99.7% minimum

Basis: free on board China, per kilogram of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 1t

Form: powder 3-4 microns

Currency: US dollars

Weight: kilograms

Timing: prompt

Assessment: twice weekly

## **Vanadium**

#### **Vanadium pentoxide fused flake min 98% du Rotterdam (per lb of V2O5), USD/lb**

Grade: vanadium pentoxide 98% minimum; silicon 0.25%, iron 0.3%, sulphur 0.03%, phosphorus 0.05%, arsenic 0.02%, and Na<sub>2</sub>+K<sub>2</sub>O 1.5% maximum

Basis: duty unpaid in-warehouse Rotterdam, per pound of vanadium pentoxide

Location: Rotterdam

Duties/tariffs: duty unpaid

Minimum lot size: 10t (+/- 2%)

Form: brown flakes 55x55x5mm

Currency: US dollars

Weight: pounds

Timing: prompt

Assessment: twice weekly

#### **Vanadium pentoxide 98% V2O5 ex-works China, Yn/t**

Grade: vanadium pentoxide 98% minimum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 10t (+/- 5%)

Form: flake

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

## **Zirconium**

#### **Fused zirconia 98.5% ZrO ex-works China, Yn/t**

Grade: 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

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 10t

Form: clean shot

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

#### **Zirconium oxychloride 36% Zr(Hf)O<sub>2</sub> ex-works China, Yn/t**

Grade: 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 SiO<sub>4</sub> 0.005% maximum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 50t

Form: crystalline powder

Currency: Chinese yuan

Weight: tonnes

Timing: prompt  
Assessment: twice weekly

**Zirconium oxychloride 36% Zr(Hf)O<sub>2</sub> fob China, USD/t**

Grade: 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 SiO<sub>4</sub> 0.005% maximum.

Basis: free on board China, per tonne of material

Location: China

Duties/tariffs: export duty paid

Minimum lot size: 50t

Form: crystalline powder

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Zirconium silicate 65% Zr(Hf)O<sub>2</sub> ex-works China, Yn/t**

Grade: zirconium (hafnium) dioxide ≥ 64.5%, Iron(II) oxide 0.15%, and titanium oxide 0.20% maximum

Basis: ex works China, per tonne of material

Location: China

Duties/tariffs: no

Minimum lot size: 50t

Form: powder

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Zirconium sponge 99.4% Zr+Hf ex-works China, Yn/kg**

Grade: 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

Basis: ex works China, per kilogram of material

Location: China

Duties/tariffs: ex works

Minimum lot size: 2-3t (+/- 2%)

Form: grains of 5-35mm, 90% minimum, free from fines

Currency: Chinese yuan

Weight: kilograms

Timing: prompt

Assessment: twice weekly

**Zircon sand**

**Hainan zircon sand min 66% (Zr.Hf)O<sub>2</sub> ex works China, Yn/t**

Grade: zirconium hafnium oxide minimum 65%, titanium dioxide maximum 0.15%, Iron (III) oxide maximum 0.1%

Basis: ex works excluding VAT

Location: China

Duties/tariffs: 17pc VAT

Minimum lot size: 100t

Form: sand

Currency: Chinese yuan

Weight: tonnes

Timing: prompt

Assessment: twice weekly

**Australian zircon sand min 66% (Zr.Hf)O<sub>2</sub> cif China, USD/t**

Grade: zirconium hafnium oxide minimum 66%, titanium dioxide maximum 0.1%, iron (III) oxide maximum 0.1%, Murray Basin of Iluka

Basis: cost, insurance, freight China

Location: China ports

Duties/tariffs: 17pc VAT

Minimum lot size: 100t

Form: sand

Currency: US dollars

Weight: tonnes

Timing: prompt

Assessment: twice weekly