

Copper Cathode Premium



Methodology and price
specifications – January 2019

Mission statement

Fastmarkets is a leading commodity price reporting agency (PRA) covering the metals, mining, minerals and forestry products industries. Our products include Our products include Fastmarkets MB, Fastmarkets AMM, Fastmarkets IM, Fastmarkets RISI, Fastmarkets FOEX and Random Lengths. For more than 100 years we have been providing commodities price reporting services for use by market participants in their day-to-day commercial activities. These services include assessments and indices of commodity prices as well as news, research and commentary on the underlying markets.

Our mission is to meet the market's data requirements honestly and independently, acting with integrity and care to ensure that the trust and confidence placed in the reliability of our pricing methodologies is maintained. We do not have a vested interest in the markets on which we report.

Introduction

Fastmarkets MB is the leading global provider of pricing intelligence for the non-ferrous metal, steel, steelmaking raw materials, industrial minerals, ferrous and non-ferrous scrap markets, producing price assessments since 1913.

Fastmarkets MB reporters are required to abide by a code of conduct and clear pricing procedures during their market reporting and pricing activities. Fastmarkets is completely independent and has no vested commercial interest in any of the markets it prices.

We are the world's largest dedicated metals price reporting team. We have offices in London, New York, Pittsburgh, Shanghai, Hong Kong, Sao Paulo, Melbourne, Singapore, Mumbai, Dnepr, Istanbul and five other US locations.

The aim of this document is to provide a clear overview of Fastmarkets MB's copper cathode methodology and specifications for the prices it assesses.

If you have any questions, please contact Fastmarkets editorial director Alex Harrison at aharrison@fastmarkets.com.

Price discovery and methodology

Methodology rationale

Fastmarkets MB's base metal pricing team aims to produce independent, transparent, fair and representative price assessments.

Fastmarkets MB has adopted and developed a clear and rigorous price discovery process and methodology, as described in the present guide, to produce assessments that are a consistent and representative indicator of the value of the market to which they relate for the trading period they measure.

In the case of copper, the Shanghai Grade A Copper Cathode cif (Cost, Insurance and Freight) Daily Premium price assessment is the industry's benchmark and is thus subject to even stricter and meticulous price discovery process and methodology.

Fastmarkets MB supports the process of price discovery through its established and independent position in the metals market. Fastmarkets MB also employs price reporters that are trained to abide by its methodology and code of conduct, and are dedicated to specific markets and regions. In the case of the Shanghai copper premiums, assessments are done by a dedicated copper price reporter and when not available, by a back-up reporter within the copper team. There are three back-up reporters trained to be able to price these copper premiums.

Before being able to properly assess the market, we must ensure that we understand exactly what information we are trying to collect. The granularity of a price is essential to defining the market and we must therefore be sure that we are clear on our price specifications and the market trends before gathering any pricing data.

Because the copper market is constantly developing, Fastmarkets MB reviews its methodology and specifications, and engages in discussions with market participants at least every six months to ensure that its price specifications and assessment techniques remain relevant and as representative of the market as possible.

The Shanghai Grade A Copper Cathode cif Daily Premium price assessment range covers both electro-refined (ER) and Solvent-extracted electrowinning (SX-EW) cathode brands. SX-EW brands are generally

priced at a lower premium to ER brands in the Shanghai market. Fastmarkets MB also publishes a range specifically for SX-EW brands and another for ER brands.

The Shanghai Grade A Copper Cathode cif Daily Premium price assessment has been designed to meet the requirements of the financial market, as well as the physical market. They are used by the Chicago Mercantile Exchange as settlement prices for the Comex Copper Premium Grade-A CIF Shanghai (Fastmarkets MB) Futures (CUP) cash-settled contract.

Price specifications and reference units

Fastmarkets MB has defined clear specifications for its copper cathode premium assessments, as outlined below, to match the industry standard.

The copper cathode specifications Fastmarkets MB uses are aligned to those required for delivery onto the London Metal Exchange.

In its copper cathode premium assessments for the Shanghai CIF market, Fastmarkets MB uses the minimum quality specifications outlined by the LME for cathode brand registration. Trade data for exchange registered brands and non-registered brands can be submitted to Fastmarkets MB for its assessment of the market.

Fastmarkets MB acknowledges that the Shanghai copper cathode import market distinguishes between cathodes produced by an ER process and the SX-EW process, and premiums are priced accordingly. ER brands are, for the most part, priced at a higher premium than SX-EW.

The Shanghai copper low-high premium, Grade A, cathode, cif, monthly average, \$ per tonne price includes a premium range covering both SX-EW and ER copper cathodes.

These specifications have been determined in consultation with market participants and are regularly reviewed. All the reference units, such as currencies and volumes used in the assessments, are in line with recognised aluminium market conventions and trading practices. The specifications also have a published minimum volume size accepted.

The delivery window of within six weeks means that Fastmarkets MB captures trade information that appropriately reflects the spot copper cathode market and concurrent premiums, where market players are buying units which they need in a short period of time.

Data for cathodes trades further out can include side-terms, extra financing costs and other factors that are part of longer-term contract agreements rather than spot deals; as such this information will not be included in Fastmarkets MB's price assessments.

Fastmarkets MB aims to collect full details of each transaction, bid and offers, including brand, commercial terms and any other details relevant to value and pricing. The price reporter ensures that the information they collect matches – or can be normalised to – the price specifications.

Data collection

Minimum data threshold

To provide a representative price for the market, the price reporter aims to collect as many representative data points as possible within the defined window. As commodity markets differ in liquidity level at different periods, Fastmarkets MB typically does not set a minimum number, or threshold, of price points to be gathered on which to base the assessment. Fastmarkets MB does not guarantee a minimum threshold for actual transactions as the market can be very illiquid at times, but every effort is made to collect as many transactions as possible.

A pricing session typically includes concluded transactions, bids and offers, contributors' market assessments or deals heard. Several separate sources from a cross section of the market (producers, consumers, traders) will typically contribute to a price assessment and Fastmarkets MB ensures that there is no key submitter dependency.

This means one contributor cannot account for a significant proportion of the data, defined as 50% or more of the six data points collected during a pricing session. Should 50% or more of the data on which to base the assessment be provided by a single source, the price reporter will continue to collect data points from market participants until the minimum threshold is reached.

Fallback procedure when no transaction data is collected

The Shanghai copper market is one of the largest for physical base metal transactions in the world, accordingly the likelihood for being unable to collect sufficient data is extremely low.

Yet, in the event of such an occurrence, Fastmarkets MB will roll the price from the previous day where sufficient data was collected.

When no actual transactions can be collected, extra caution is applied during the price assessment process. Price reporters are encouraged to keep the price unchanged until actual transactions back up a change. Yet, should all bids, offers and assessments fall outside the existing price range for at least two consecutive pricing sessions, price reporters can move the price to reflect the levels where business would take place if transactions were to actually take place.

Timeframe for data submissions

The timeframe for data submissions and publishing the price is 4pm UK time. In almost all instances, data collection and price setting will be done within Chinese trading hours, however in some instances the main reporters in China will be unable to price the market, leaving colleagues with relevant experience in London to do so.

The timeframe also reflects that on busy trading days market participants may only be free to communicate trade data after working hours.

In addition, it reflects that market participants based outside of China trade the Shanghai copper cathode markets and are able to provide relevant information accordingly.

Data contribution

Any market participant actively involved in the physical copper cathode spot market may become a data contributor following a review by Fastmarkets MB of its activities. The aim is to ensure that submitters have sufficient visibility and understanding of the market to be able to provide reliable price data.

Fastmarkets MB aims to engage a broad and balanced range of physical market participants in the provision of data, including producers, consumers and traders who are selling or buying copper cathodes.

We expect that data submitters taking part in the pricing process are authorised to report market data on behalf of their organisations.

Fastmarkets MB's Data Submitter Policy provides guidelines to ensure the high level of data quality and integrity that we expect from contributing organisations providing pricing data. The policy can be found on Fastmarkets MB's website or is available upon request.

Fastmarkets MB encourages contributors to submit all their pricing data, especially all their concluded transactions, and not be selective.

Only transactions that have been concluded at arm's length and data that match the price specifications – or can be calculated back to meet the specifications – will be included in the assessment. Price reporters generally speak to, and collect data from, front office staff directly involved in the commercial buying and selling of copper cathodes.

But they also welcome organisations to submit pricing data from authorised back office functions. The price reporter collects data primarily by telephone, but also by email, digital messenger services or face-to-face. The key to good price discovery is to speak whenever possible to sources on both sides of a transaction in order to crosscheck the pricing information received.

All data supplied to Fastmarkets MB is kept strictly confidential and stored in our secure online pricing database system, MInD (Metals Information Database).

Metal Bulletin Group may sign Data Submitter Agreements (DSAs) with any data provider, if requested to do so, in order to maximise the number of data points collected for inclusion in the assessment process. Any data received subject to DSAs will be used in the pricing assessment but not be published. For new data submitters, Fastmarkets MB follows the procedure for adding new sources into Fastmarkets MB's price database system (MInD) as explained in the 'Approval of New Data Sources Procedure' document available online.

Data analysis

Assessment using specifications and expert judgment

Once data collection is complete, Fastmarkets MB reviews the data points applying its methodology and its expert judgment to set the price range to reflect the representative spread of prices at which business has been transacted, offered or bid, or indicated in the absence of business.

Before making an assessment, the following factors must be considered:

- Is the information received credible? If questionable: have we seen signed contracts (preferable), or has it

been confirmed on both sides of the deal?

- If credible: were all the prices in a similar range?
- Were all the deals reported of a similar size?
- Do the reported deals all have the same terms and specifications?
- Did all the sources indicate the market was headed in the same direction? If not, why not?
- It is not unusual for different sources to report slightly different numbers but it is important, as far as possible, to understand why they are different.
- In the absence of trade, what are the prevailing bids/offers in the market? Did the source provide firm bids/offers or indicative numbers?
- What are the positions of the contributors?
- Are we confident about the freight or free-on-charge costs?
- Has an adequate sample been obtained which correctly represents the market?

Once the above factors have been considered, Fastmarkets MB will produce a price assessment and set the price following the guidelines below.

Fastmarkets MB does not treat all collected information equally, but has a justification and rationale for how each piece of information obtained has been used. Greater weighting is given to actual concluded transaction data, but other data is also used: bids and offers are second behind transactions in order of importance, followed by deals indirectly reported to Fastmarkets MB (referred to as deals heard) and lastly by data sources' own assessments of the market when they have no business to report.

Depending on market liquidity, Fastmarkets MB also reserves the right to use pricing data that has been submitted during the collection window, but transacted up to two working days prior, in an effort to increase liquidity and capture the spot market trend while avoiding the unnecessary volatility that could emanate from daily pricing. For instance, in a stable premium market, Fastmarkets MB may include in its assessment a transaction done up to two days before the collection window. Although, in a fast-moving premium market, Fastmarkets MB would be more likely to discard such a transaction.

Other considerations might also intervene in the price assessment such as, the trustworthiness of a data source, based on past data submissions, or their willingness to provide data on a consistent basis.

When no actual transactions can be collected, extra caution is applied during the price assessment process.

Price reporters are encouraged to keep the price unchanged until actual transactions back up a change. Yet, should all bids, offers and assessments fall outside the existing price range for at least two consecutive pricing sessions, price reporters can move the price to reflect the levels where business would take place if transactions were to actually take place.

As a general rule, larger deals carry more weight, but Fastmarkets MB tries and ascertains what sort of discount a large lot size carries or what sort of premium a smaller deal would carry.

Fastmarkets MB will compare the information received from a single source with the information provided by the same source in the previous pricing cycle. This way, if a source consistently gives low or high numbers, Fastmarkets MB can still use the data without it unduly influencing its assessment.

Data normalisation

Occasionally, Fastmarkets MB receives price data for material with different specifications – for instance, different material quality, delivery terms or delivery location, different cargo size or payment terms. In such cases, when appropriate, Fastmarkets MB normalises data to its typical specifications.

A typical example is a data point that is given basis CIF Huangpu, Qingdao, Ningbo-Zhoushan or other major coastal Chinese cargo delivery locations.

In these instances Fastmarkets MB will ask the data contributor for their net-back to a CIF Shanghai premium. Fastmarkets MB also uses regularly updated freight parity tables to ascertain the correct additional premium or discount to be applied.

If data cannot be adequately accounted or netted back to the cif Shanghai copper cathode specifications, it will be discarded.

Another example is a price that is either net-back or net-forward due to payment terms different from Fastmarkets MB's specifications. Payment terms are based on typical commercial practice in the copper cathode spot market. Transactions that are conducted on different payment or credit terms can be normalised, taking into account discounts, interest rates and standard commercial terms.

Fastmarkets MB will use its editorial judgment to determine whether payment terms reported for specific deals match typical commercial terms and adjust the

normalisation accordingly. Editorial judgment will also apply when treating transactions reported inclusively of offsets generated by LME spread trading – one party may take a spread position on the forward curve (contango or backwardation) that enables it to sell below market premiums or buy above market premiums.

Fastmarkets MB's price specifications also define the minimum lot size accepted. When volume information is available, this is also taken into consideration in the assessment process. For instance, typically a deal with a bigger volume will carry more weight in the price reporter judgement than a smaller volume transaction. Yet, price reporters will also consider, for instance, to normalise or discard a price reported for a deal with an abnormally large or small volume.

Full details of data inputs prior and post normalisation are stored in Fastmarkets MB's MInD electronic database and may be accessed at any time for internal review and auditing purposes.

Criteria to discard pricing data

Fastmarkets MB will use its expert judgment to exclude outlying or unrepresentative numbers, and discount or discard prices that it believes may otherwise be questionable and unreliable.

Submitted data may be excluded from the price assessment if it is deemed to be anomalous by Fastmarkets MB price reporters or editors.

Data may also be excluded if it fails to comply with Fastmarkets MB specifications for the price, including cathode quality, delivery time, or if data is not accompanied by additional information allowing price reporters to net-back the data to Fastmarkets MB specifications.

Outliers will be investigated, and suspected attempts to unfairly influence the price assessments may result in the data provider being warned or excluded.

When a transaction appears questionable or well outside the range reported by other market participants, Fastmarkets MB may seek confirmation of the claimed deal by requesting to see contracts or other signed paperwork before inclusion of the data in the price assessments. If this is refused, Fastmarkets MB will seek to corroborate the information it receives by matching trades. So if a seller tells us he has sold a certain amount at a certain level, we then try to speak to the buyer involved in the transaction to confirm the transaction.

If this is not possible, the data supplied may be excluded from the assessment process.

Fastmarkets MB reserves the right to exclude data that is not fairly presented or is believed may be an effort to distort the price assessments.

Data publication

Peer review process

All Fastmarkets MB's price assessments are set by a first reporter who covers that specific market, peer reviewed by a second reporter, and always signed-off and approved by a senior reporter or editor prior to publication.

This peer review process, which takes place in MInD is fully auditable and is in place to make sure that pricing procedures and methodologies are correctly and consistently applied and to ensure integrity and quality of the published prices.

Price reporters are formally trained in the price discovery process and must abide by a written Code of Conduct and pricing procedures.

Publication

At the end of the peer review process, Fastmarkets MB publishes its price assessments via MInD and onto its website and price book.

The CIF Shanghai copper cathode price assessments are reported as a premium range, as a single number and as a breakdown of SX-EW and ER cathode premium ranges.

To enhance market transparency and to provide evidence of data inputs that support the price discovery process, Fastmarkets MB may publish trade logs for its Shanghai copper prices, while maintaining full counterparty confidentiality, pricing data and volume received from data contributors.

Fastmarkets MB also publishes daily pricing rationales to explain price settlement and editorial judgment. These notes explain, for instance, why price reporters may conclude whether anomalous or suspicious data should be excluded; when reporters determine a price and a price range based on market information; or when judgment is applied when the dataset collected is not considered suitably robust so that fall-back procedures need to be applied.

Fastmarkets MB's base metals price assessments are not published on England and Wales holidays, in accordance with the LME holiday calendar (see below).

Price assessments that are due to be published on LME holidays will instead be published on the closest working day that precedes or follows that date. Fastmarkets MB's base metals price assessments are published between 3-4pm London local time. They are not published on England and Wales holidays, in accordance with the LME holiday calendar.

Price assessments that are due to be published on UK public holidays will instead be published on the closest working day that precedes or follows that date.

2019	1 January	New Year's Day
	19 April	Good Friday
	22 April	Easter Monday
	6 May	Early May bank holiday
	27 May	Spring bank holiday
	26 August	Summer bank holiday
	25 December	Christmas Day
	26 December	Boxing Day

*source: www.gov.uk

Chinese holidays

Like other financial markets, the Shanghai copper cathode trade diminishes over Chinese public holidays, during which Fastmarkets MB continues to update the premium, which is rolled over from the last trading day before the holiday.

2019 public holidays in China include:

February 4-10	Chinese New Year
October 1-7	National Day Holiday

Price correction policy

Publication of price errors can occasionally happen for reasons that may include technical, input errors or incorrect application of the methodology.

To minimise the inconvenience to our subscribers, Fastmarkets MB aims to investigate each error as soon as it becomes aware of it and to publish a correction promptly on its website through a pricing notice with an explanation of the reason for the correction.

Fastmarkets MB will publish a correction of a price only where it has established undeniably that there has been an error. Fastmarkets MB's price assessments are produced based on the best data available at the time of the assessment. It will not retroactively change a

price based on new information or additional submission of data received after a respective pricing session has closed.

Methodology and price specification review process

Methodology review and pricing notices

Fastmarkets MB aims to continually develop and periodically review its methodologies in consultation with industry participants, with the objective to adopt product specifications and trading terms and conditions that reflect and are representative of typical working practices in the metals industry.

For the Shanghai copper cathode price assessments, Fastmarkets MB is committed to review its methodology and price specifications at least every six months.

Any change to the methodology and/or price specifications are implemented following a consultation process which starts with Fastmarkets MB posting on its website an advance pricing notice providing clear details and a timeframe for the change proposed. The objective of the consultation process is to give market participants sufficient time and opportunity to provide feedback and views about the change proposed.

A Pricing Notice will include the outline of the proposed change; the rationale, motivation, for proposing such a change; a clear timeframe; the date by which any feedback must be submitted and the method for submission; the date on which, if the change goes ahead, it will be implemented.

At the conclusion of the consultation process, Fastmarkets MB will publish a Pricing Notice to communicate its decision and to provide also a summary of the comments received (maintaining confidentiality where it was requested) and our responses to those comments. Market participants who provide feedback on the proposed change should ensure they clearly state if their comments are intended to be confidential.

The minimum required time to allow for feedback will vary depending on what Fastmarkets MB believes the impact of the considered change would be for the market.

Changes to the existing methodology will either be classed as 'material' or 'immaterial'. 'Material' changes are those that may result in fundamental changes to the published price once implemented. These include specification changes or index structural changes. 'Immaterial' changes are those that will not result in a different price level once implemented. Typically a material change will require a three-month consultation period.

For more details on the formal review of the methodology and the consultation process to propose changes to the methodology, refer to the Methodology Review and Change Consultation Process available on Fastmarkets MB's website.

The evolution of pricing

Fastmarkets MB develops and adjusts its pricing mechanisms in response to changing market conditions. The evolution of long-term contracts to index-linked pricing often occurs as industry players seek to link their pricing to market fundamentals and spot market activity. This trend has been seen clearly in the aluminium market. While Fastmarkets MB does not seek to drive the direction of the markets it covers, it aims to identify opportunities where spot market activity can be captured, and greater transparency provided through new price assessments.

The development of a pricing mechanism is a process, and as liquidity increases, the sophistication of the pricing methodology can be increased.

Queries and complaints

Fastmarkets MB encourages engagement from the market on its pricing principles and methodology. The company promotes understanding of its pricing procedures and is committed to responding to requests for further information and clarification on a timely basis.

There are multiple channels for interaction with the pricing team including email, telephone and instant messenger services.

If a subscriber has an issue with the published prices, then they may contact the pricing team. In the event that the response is not satisfactory the issue may be escalated to the internal compliance department. For more details refer to Fastmarkets MB's Complaint Handling Policy available on Fastmarkets MB's website.

Fastmarkets MB takes all queries and complaints seriously and will seek to provide an explanation of

the prices wherever possible. It is important to note, however, that input data remain confidential and cannot be provided to third parties.

Calculation of average prices

Fastmarkets MB publishes monthly averages for its Shanghai copper cathode premium assessments and for prices from the LME. The monthly averages are calculated by dividing the sum of the price quotations by the number of quotations published during the calendar month.

There is a monthly average high price and average low price. The LME monthly averages are calculated by dividing the sum of the daily bid/ask mean by the number of trading days during the month.

Become a contributor to the price discovery process

Fastmarkets MB continually seeks to increase the number of market sources willing to take part in the price discovery process. The main condition Fastmarkets MB requires from contributors is for them to be active participants in the spot market.

Fastmarkets MB's Data Submitter Policy provides guidelines defining the high level of data quality and integrity that Fastmarkets MB expects. Market participants that wish to provide pricing data and be part of the price discovery process should first read the Data Submitter Policy available on the website.

All data sources are subject to review before data submitted is fully taken into account in the pricing process. The aim is to make sure that submitters are trustworthy and have sufficient visibility and understanding of the market to be able to provide viable price data.

Copper cathode daily CIF Shanghai premium

CHINA

Assessment:	Copper premium, grade-a copper cathode CIF Shanghai
Type:	Assessed range
Basis:	Cost, Insurance and Freight to Shanghai, premium on top of LME cash prices
Grade:	Grade A / Grade 1 (As+Cd+Cr+Mn+P=Sb) max 0.0015%)
Currency:	USD
Unit:	Tonne
Min lot size:	25 tonnes
Payment terms:	Cash or letter of credit against documents; other terms normalised
Delivery window:	Within 6 weeks
Form:	Cathode
Publication:	Daily. Between 3pm and 4pm London time
Pricing bureau:	Shanghai, London

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