

Cobalt High and Low Grade



Methodology and price specifications – October 2018

Mission statement

Fastmarkets is a leading commodity price reporting agency (PRA) covering the metals, mining, minerals and forestry products industries. Our products include Metal Bulletin (Fastmarkets MB), American Metal Market (Fastmarkets AMM), Industrial Minerals (Fastmarkets IM), RISI, 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, CIS, Istanbul and five other US locations.

The aim of this document is to provide a clear overview of Fastmarkets MB's ferrous 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 has defined clear specifications for its Cobalt assessments, as outlined below, to match the industry standard.

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 market conventions and trading practices. The specifications also have a published minimum volume size accepted.

Fastmarkets MB aims to collect full details of each transaction, bid and offer, 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.

Methodology

Data collection

During the price discovery process, the price reporter aims to discover at what representative level market participants have concluded business, made offers or received bids over a defined time period, or window.

Collection window

The window for cobalt - twice a week for high and low-grade - was determined after considering the number of data points that Fastmarkets MB can reasonably expect to collect on a consistent basis over the selected period to support the price assessment process, ensuring that the assessments produced is a reliable indicator for the physical market they relate to.

The price assessments are published at 3pm London time and the deadline for data submission is 2pm London time. Data received after this time will not be included in the price assessment.

The data collection window runs from the time of publication of the last price assessment to 2pm on the day of the next assessment. Only data points communicated to Fastmarkets MB within the data collection window will be included in the price discovery

process. The published prices are reflective of the levels seen during this stated collection period.

Minimum data threshold

In order 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.

Because 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.

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. Fastmarkets MB cannot guarantee a minimum threshold for actual transactions as markets naturally vary in liquidity, but every effort is made to collect as many transactions as possible.

Data contribution

Any market participant actively involved in the physical cobalt 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 cobalt.

We expect that data submitters taking part in the pricing process are authorized 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 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 activity of buying and selling. 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 direct face-to-face submission.

The key to good price discovery is to speak whenever possible to sources on both sides of a transaction in order to cross-check 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). Fastmarkets MB may sign a Data Submitter Agreement (DSA) with any data provider, if requested to do so, to maximise the number of data points collected for inclusion in the assessment process. Any data received subject to a DSA will be used in the pricing assessment but will not be published.

For new data submitters, Fastmarkets MB follows the procedure for adding new sources into Fastmarkets MB's price database system (MInD).

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 judgement 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 below guidelines.

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 assessment of the market when they have no business to report.

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. However, should bids, offers and assessments fall outside the existing price range, 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 with a single source with the information given by the same source in the last 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 adjusted due to Incoterms (International Commercial Terms) being different from Fastmarkets MB's specifications. For example, a data contributor will report a transaction done with a cobalt consumer on a delivered basis, as opposed to the in-warehouse incoterm specified in Fastmarkets MB's methodology. In which case Fastmarkets MB will normalise the transaction's value by subtracting the cost of moving material from inside a warehouse to the consumer. To calculate that cost, Fastmarkets MB will ask the data contributor to net back the transaction to an in-warehouse basis as well as using its own cost estimate, which is regularly assessed and reviewed by its dedicated price reporters. Fastmarkets MB reserves the right to exercise editorial judgment to net transactions back to typical commercial terms.

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 cobalt 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.

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

Criteria for discarding pricing data and removal of outlier 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.

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 Fastmarkets MB's MInD system and is fully auditable, 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.

Fastmarkets MB also publishes weekly pricing rationales to explain price settlement and editorial judgement. 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 judgement is applied when the dataset collected is not considered suitably robust so that fall-back procedures need to be applied.

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 Cobalt assessment is reported as a range, which reflects where the bulk of the business has been or is likely to have been concluded over the quotation period.

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 Cobalt price assessments, while maintaining full counterparty confidentiality, pricing data and volume received from data contributors.

Fastmarkets MB's Cobalt price assessments are published Wednesday and Friday by 3pm London time.

Price assessments that are due to be published on UK public holidays* will be rolled over and published on that day.

Price assessments that are due to be published between December 25 and January 1, inclusive, will be rolled over and published on that date due to office closures.

2018	25 December	Christmas Day
	26 December	Boxing Day
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

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 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.

Fastmarkets MB aims 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 feedbacks 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 Fastmarkets MB's Methodology Review and Change Consultation Process available on Fastmarkets MB's website.

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.

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 from contributing organisation providing pricing data. 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 Fastmarkets MB's website.

All data sources are subject to review before their 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.

Specification

Cobalt High and Low Grade

ROTTERDAM

Assessment:	Cobalt High Grade, Rotterdam \$ per lb
Location:	Rotterdam
Unit:	US\$ per lb
Delivery:	Within 30 days, other terms normalised
Min lot size:	1 tonne
Max lot size:	100 tonnes
Quality:	High-grade cobalt metal, 99.8% minimum cobalt content. Nikkelverk cut cathodes, Vale cobalt rounds, SMM cut cathodes, Jinchuan cut cathodes, Jiangsu (KLK) broken cathodes, Sherritt briquettes
Form:	Cut cathodes, rounds, broken cathodes, briquettes
Packaging:	Original packaging
Payment terms:	Cash; other terms normalised
Publication:	Twice weekly. Wednesday and Friday, at 3pm London time

ROTTERDAM

Assessment:	Cobalt Low Grade, Rotterdam \$ per lb
Location:	Rotterdam
Unit:	US\$ per lb
Delivery:	Within 30 days, other terms normalised
Min lot size:	1 tonne
Max lot size:	100 tonnes
Quality:	Low-grade cobalt metal, 99.3% minimum cobalt content. Katanga cathodes, Chambishi broken cathodes, CTT broken cathodes, Norilsk ingots (K1A and K1AY), Tocantins broken cathodes, Minara briquettes, Ambatovy briquettes
Form:	Broken cathodes, ingots, briquettes
Packaging:	Original packaging
Payment terms:	Cash; other terms normalised
Publication:	Twice weekly. Wednesday and Friday, at 3pm London time

* Please note, in light of feedback received as part of the consultation on its international cobalt price specifications, Fastmarkets MB will change the names of its benchmark in-warehouse Rotterdam assessments in January 2019. From January 2019, the name 'standard-grade' will replace the name 'low-grade'. The name 'alloy-grade' will replace the name 'high-grade'.

The last date prices will be published as 'low-grade' and 'high grade' will be Friday December 28. Prices will be published under their new names from January 2, 2019. Norilsk ingots (K1A and K1AY) and Tocantins broken cathodes will no longer be accepted as part of the "standard-grade" quote from January 2019, and the minimum cobalt content for the "standard-grade" quote will subsequently increase to minimum 99.8% cobalt content.

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