

Manganese Ore Index



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, CIS, Istanbul and five other US locations.

The aim of this document is to provide a clear overview of Fastmarkets MB's manganese ore 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

The primary role of the Fastmarkets MB Manganese Ore Indices is to provide market participants with a fair and robust representation of the physical Manganese Ore spot market price. Fastmarkets MB's rationale for adopting the price-discovery process described in this methodology document is to produce a consistent and representative indicator of market value to suit the manganese ore market's requirement for a transparent pricing mechanism.

The aim of the indices is both to be reflective of the prices seen during the data collection window; and to be a reliable indicator of the value of the manganese ore market to which they relate. Fastmarkets MB chose a data collection window of seven days after considering the number of data points it could reasonably expect to collect on a consistent basis to support the index calculation process.

The manganese ore market is constantly developing. Fastmarkets MB reviews its methodology and specifications, and engages in discussions with market participants on a regular basis to ensure they remain as representative of the market as possible.

The Fastmarkets MB Manganese Ore Index methodology has been designed to meet the requirements of the financial market as well as the physical market.

Data collection

Data collection and quality

The basis of all our indices is the data provided by the market. To provide the most representative pricing for the market, it is essential we are able to collect as many representative data points as possible.

Any market participant involved in the physical Manganese Ore market may be able to contribute data to the index following a review by Fastmarkets MB of their activities. The aim is to make sure 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. Fastmarkets MB's Data Submitter Policy provides guidelines to ensure the high level of data quality and

integrity that Fastmarkets MB expects from contributing organisations providing pricing data. The policy can be found on Fastmarkets MB's website or is available upon request.

Fastmarkets MB encourages data sources to provide data on all concluded transactions and welcomes provision of data from employees in back-office functions.

Fastmarkets MB uses multiple channels to collect data, including phone calls, email, and digital messenger services across our offices in London, Shanghai, Singapore and Sao Paulo.

The deadline for data submission is 2pm London time each Friday. Data received after this time will not be included in the calculation of the index. The data collection window runs for the seven days prior to the 2pm data submission deadline. Only price data submitted and communicated to Fastmarkets MB within the seven-day window will be included in the calculation of the index. The index is reflective of the prices gathered during this window.

All the reference units used in the index, including currencies and volumes, are in line with recognized manganese ore market conventions and the reference units used in these markets. The index specification has a minimum volume size accepted.

All data supplied to the Fastmarkets MB Manganese Ore indices is kept strictly confidential. The Fastmarkets MB index team may sign Data Submitter Agreements (DSAs) upon request with any data provider.

Index calculation

The Fastmarkets MB Manganese Ore Index is a tonnage-weighted calculation, where actual transactions carry full weight, as reflected by the reported volume, while offers, bids and market participants' own assessments of the market are weighted at the specified minimum tonnage for the index. Fastmarkets MB aims to collect full details of each transaction including brand, commercial terms and any other details relevant to value and pricing.

Market balance

The Fastmarkets MB Manganese Ore Index methodology is designed to provide market participants with a fair and robust reflection of the physical Manganese Ore spot price. The methodology incorporates structures and mechanisms to ensure a balanced and consistent

calculation that is able to resist possible undue influences.

The Fastmarkets MB Manganese Ore Index is structured to balance the influence of both sides of the market: sellers and buyers. This reduces the potential risk of market distortions and bias in the data and ensures that all parts of the market have the same influence on the final index calculation.

The published index figure is the straight average of two sub-indices, each of which contain data from either the buy side or sell side of the market. Each sub-index is a tonnage-weighted calculation of normalized price data. Only the final index is published. The use of two sub-indices means that each part of the market has a maximum 50% weighting in the final index. This removes the possibility of bias or any single data provider having an overbearing influence on the final index.

Normalization

Some material traded on the manganese ore spot market differs from the base specification of the indices. This price data requires normalization to determine the equivalent price for the respective index base specification.

Material that falls within the target specification range is normalized to the index base specification and port of delivery or origin. The base specifications and ranges have been chosen following consultation with the market to reflect the reality of the physical spot market.

Data is normalized to the base specifications using in-house models based on regression analysis of the collected data points. The analysis allows Fastmarkets MB to capture the value-in-use applied by the market to different materials, and to normalize to a single specification. This normalization process also allows Fastmarkets MB to capture and normalize variables outside of the chemical and physical properties such as values associated with regional origin and product-specific factors.

The normalization coefficients for the Manganese Ore indices are updated every quarter to reflect the constantly changing value-in-use relationship of different products and grades. This reflects the level of data liquidity in the market and balances the requirement to keep the value-in-use calculations reflective of the market while also providing a statistically robust data set for analysis.

Finally, material that is transacted on a different pricing basis can be normalized to the index pricing terms using

relevant variables. Where deemed necessary to provide a robust data set for calculation, Fastmarkets MB may normalize CIF-basis transactions to an FOB-basis using a freight rate netback. The freight rate is updated weekly based on a survey of market participants, and the netback incorporates the ore moisture level of the transaction in question. Where the moisture level is unknown, the index base of 4% is used. Deals loading from or delivered to ports other than the index base will be normalized to the specified base port using freight differentials from broker or market participant assessments.

FOT (free on truck) Chinese ports data will not be used in the CIF or FOB indices.

Specification payment terms are based on typical commercial practice in the manganese ore spot market. Transactions that are conducted on different payment or credit terms can be normalized, taking into account discounts, interest rates and standard commercial terms.

Criteria for discarding pricing data and the removal of outlier data

Fastmarkets MB uses its expert judgment to exclude prior to inclusion in the model unrepresentative numbers and discard prices that it believes may otherwise be questionable and unreliable.

Fastmarkets MB has constructed its Manganese Ore Index to exclude outlier data automatically. All data points that fall more than 10% away from the initial calculated index are automatically excluded - the index is then recalculated. Outliers will be investigated; suspected attempts to influence the index unfairly may result in the data provider being warned or excluded.

Fastmarkets MB reserves the right to see contracts and signed paperwork before inclusion of the data in the calculation. If this is refused, the data supplied may be excluded from the calculation process. Fastmarkets MB reserves the right to exclude data that is not fairly presented or is believed to be an effort to distort the Index.

Index calculation in periods of low data liquidity

The Fastmarkets MB Manganese Ore Index is calculated based on price data collected from the market. The index is set up so that actual transactions have the greatest effect on the final calculated price. Since Fastmarkets MB aims to calculate each index using a robust data set, it will therefore where necessary look to use price data including assessments, offers and bids collected from the market. Data points that do

not reflect actual transactions will be entered into the indices in the same way as transaction data but will be weighted according to the lowest tonnage permissible for the index.

Fastmarkets MB does not specify a minimum amount of transaction data, or a transaction data threshold, required for the publication of its indices because liquidity varies across the manganese ore spot market.

In the event that in a particular pricing session the dataset collected is not considered suitably robust (such as too few data points on the day) for the calculation of a particular index, Fastmarkets MB will implement its calculation fall-back procedures (above right) until a suitable number of data points is reached to calculate the index.

In the event that in a particular pricing session the dataset collected is not considered suitably robust (such as there being too few data points) for the calculation of an index, Fastmarkets will implement the following fall-back procedures (1-7) until a suitable number of data points is reached to calculate the index:

1. Carry over transaction data from other sub-indices in same calculation period
2. Carry over non-transaction data from other sub-indices in same calculation period
3. Carry over transaction data from the previous calculation in the appropriate sub-index
4. Carry over transaction data from the previous calculation from any sub-index
5. Carry over non-transaction data from the previous calculation in the appropriate sub-index
6. Carry over non-transaction data from the previous calculation from any sub-index
7. If no price data can be collected, the index price will be carried over

The implementation of fall-back procedures does not affect the tonnage weighting of the original data point. In the unlikely situation that more than half of the pricing data collected on one day is provided by a single source, Fastmarkets will use the fall-back procedures 3-7 (see above) to ensure there is not a dependency on a significant proportion of data (of 50% or more) being provided by a single entity.

Publication

The Manganese Ore Index is published every Friday at 3pm London time. Indices are not published on England and Wales public holidays.

England and Wales bank holidays* are as follows:

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

Where public holidays occur on a Friday, the indices will be published on the following working day.

Corrections and delays

If an index is published incorrectly, it will be rectified and republished as soon as possible. A correction notice will be sent to all subscribers.

Fastmarkets MB employs several procedures and measures to avoid delays in the publication of its indices. In the event of a delay, however, Fastmarkets MB will inform subscribers as soon as possible. In the event of late publication only data that has been received within the correct standard time frame will be included in the calculations. No indices will be amended due to the emergence of new data or market activity after the initial publication. Retrospective changes to the published values will only be made in cases of administrative or calculation error.

Methodology and price specifications review process

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

Any change to the methodology and/or price specifications are implemented following a consultation process that starts with Fastmarkets MB posting on its website an advance pricing notice providing clear details and a timeframe for the proposed change.

The objective of the consultation process is to give market participants sufficient time and opportunity to provide feedback and views about the change proposed.

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

Procedure to ensure consistency in the price discovery process

Fastmarkets MB aims to maintain the highest standards in the provision of prices to those involved in the global metals industry. All Fastmarkets MB pricing employees are required to adhere to Fastmarkets MB's Code of Conduct and Pricing Guidelines.

All indices are subject to peer review prior to publication and are signed off by a senior member of Fastmarkets MB's editorial or index teams. This peer-review process 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.

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

Index-related queries and complaints

Fastmarkets MB encourages engagement from the market on its pricing principles and methodology. The company promotes understanding of its calculation 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 Index department including email, telephone and instant messenger services.

If a subscriber has an issue with published prices, they may contact the Index 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 our 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 calculation models and input data remain confidential and cannot be provided to third parties.

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 as much as possible the inconvenience to our subscribers, Fastmarkets MB aims to investigate each error immediately 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 that undeniably 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.

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 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 a contributing organisation providing pricing data. The policy can be found on Fastmarkets MB's website or upon request.

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.

If you want to become a contributor to Fastmarkets MB pricing, or have questions or comments about the methodology and price specifications, please contact the Fastmarkets MB editorial director Alex Harrison, aharrison@fastmarkets.com.

Specifications

Manganese ore indices

SOUTH AFRICA

Index:	MnOI37 FOB
Unit:	US\$ per dry metric tonne unit, fob Port Elizabeth, South Africa
Contents:	
Manganese:	Base 37%, Range 35-39%
Iron:	Base 5%, Maximum 10%
Silica:	Base 5.5%, Maximum 12%
Phosphorous:	Base 0.025%, Maximum 0.160%
Alumina:	Base 0.2%, Maximum 2%
Moisture content:	Base 4%, Maximum 12%
Form:	Lump
Delivery:	Port Elizabeth (South Africa)
Granularity:	5.5-75mm
Quantity:	5,000 tonnes
Delivery window:	Within nine weeks
Payment:	Cash or equivalent
Publication:	Friday, 3pm London

CHINA

Index:	MnOI44 CIF
Unit:	US\$ per dry metric tonne unit, cif Tianjin, China
Content	
Manganese:	Base 44%, Range 42-48%
Iron:	Base 5%, Maximum 16%
Silica:	Base 11%, Maximum 12%
Phosphorous:	Base 0.10%, Maximum 0.16%
Alumina:	Base 5%, Maximum 14%
Moisture:	Base 4%, Maximum 12%
Form:	Lump
Delivery:	Tianjin (China) – normalized for any Chinese mainland sea port
Granularity:	5.5-75mm
Quantity:	Min 5,000 tonnes
Delivery window:	Within nine weeks
Payment:	Cash or equivalent
Publication:	Friday, 3pm London

Index:	MnOI37 CIF
Unit:	US\$ per dry metric tonne unit, fot Tianjin, China
Content	
Manganese:	Base 37%, Range 35-39%
Iron content:	Base 5%, Maximum 10%
Silica content:	Base 5.5%, Maximum 12%
Phosphorous:	Base 0.025%, Maximum 0.16%
Alumina:	Base 0.2%, Maximum 2%
Moisture:	Base 4%, Maximum 12%
Form:	Lump
Delivery:	Tianjin (China) – normalized for any Chinese mainland sea port
Granularity:	5.5-75mm
Quantity:	Min 5,000 tonnes
Delivery window:	Within nine weeks
Payment:	Cash or equivalent
Publication:	Friday, 3pm London

Index:	MnOI44 FOT
Unit:	Yuan per dry metric tonne, fot Tianjin port, China
Content	
Manganese:	Base 44%, Range 42-48%
Iron content:	Base 5%, Maximum 16%
Silica content:	Base 11%, Maximum 12%
Phosphorous:	Base 0.10%, Maximum 0.16%
Alumina:	Base 5%, Maximum 14%
Moisture:	Base 4%, Maximum 12%
Form:	Lump
Delivery:	Tianjin (China) – normalized for any Chinese mainland sea port
Granularity:	5.5-75mm
Quantity:	Min 1,000 tonnes
Delivery window:	Immediate
Payment:	Cash or equivalent
Publication:	Friday, 3pm London

Index: **MnOI37 FOT**
 Unit: Yuan per dry metric tonne, fot Tianjin port, China

Content

Manganese:	Base 37%, Range 35-39%
Iron content:	Base 5%, Maximum 10%
Silica content:	Base 5.5%, Maximum 12%
Phosphorous:	Base 0.025%, Maximum 0.16%
Alumina:	Base 0.2%, Maximum 2%
Moisture:	Base 4%, Maximum 12%
Form:	Lump
Delivery:	Tianjin (China) – normalized for any Chinese mainland sea port
Granularity:	5.5-75mm
Quantity:	Min 1,000 tonnes
Delivery window:	Immediate
Payment:	Cash or equivalent
Publication:	Friday, 3pm London

Contacts

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Your investment actions should be solely based upon your own decisions and research and appropriate independent advice should be obtained from a suitably qualified independent adviser before any such decision is made.