Stainless Steel 304 Europe Raw Materials Index

Methodology and price specifications – February 2019
Mission statement

Fastmarkets is a leading commodity price reporting agency (PRA) covering the metals, mining, minerals and forest products industries. 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 MB 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 Stainless Steel Raw Material Index 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 produces independent, fair and representative price assessments and indices of steel, steelmaking raw materials and ferrous scrap prices on a daily, bi-weekly, weekly or monthly basis.

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 stainless steel raw materials market’s requirement for a transparent pricing mechanism.

During the price-discovery process, the price reporter’s goal is to discover at what representative level market participants have concluded business, made offers or received bids over a defined trading period.

This is generally the period since the conclusion of the previous price quotation. If, for instance, the most recent index calculation published by Fastmarkets MB was on Friday at 2-3pm London time and our next assessment is due on the following Friday at 2-3pm London time, we will accept price data for business conducted and reported to Fastmarkets MB in the week up to 2pm on the Friday of the following assessment.

Data collection criteria
Fastmarkets MB reporters aim to talk to a broad sample of market participants specifically involved in the buying and selling of the steel product or steelmaking raw material of interest. They seek as fair and as wide a representation of both sides of the market as possible, including producers and consumers as well as traders.

Depending on market liquidity, Fastmarkets MB also reserves the right to base its prices on bids, offers, deals heard and market participants’ assessments or indications of prevailing values. Fastmarkets MB welcomes organisations to submit transaction data from authorised back-office functions.

Price specifications and reference units
Fastmarkets MB has clear specifications for all the price points that it covers. All the reference units, such as currency and volume, are in line with the trading conventions in recognised steel and steelmaking raw materials markets.

Fastmarkets MB’s specifications detail the material’s characteristics or quality, location, incoterm, payment terms and the minimum volume accepted. These specifications are determined in consultation with market participants and follow industry convention. Reporters ensure that the information they receive matches these specifications.

Guidelines that control the exercise of judgment by price reporters during the assessment process
To produce the price assessment, greater weighting is generally given to actual concluded transaction data. Bids/offers are second in order of importance, followed by data sources’ own assessments of the market when they have no business to report. But other considerations might also intervene such as the trustworthiness of a data source based on past data submissions or their willingness to provide data on a consistent basis.

Index calculation
Fastmarkets MB’s Stainless Steel 304 Europe Index aims to represent the costs of the raw materials needed to produce the steel alloy.

The stainless steel index provides the slab price for a $64-billion+ industry using raw materials prices at the highest available frequency.

The Stainless Steel 304 Europe Index:
- Models the components of a typical slab made by European producers
- Measures the price of the raw materials needed to melt stainless steel of grade 304 in Europe
- Uses industry-wide acknowledged price sources and state-of-the-art index methodology
- Provides weekly updates of prices in US dollars

The index reflects the costs of the raw material needed to produce the steel alloy – in other words, the material delivered to the producer. It does not contain production costs itself, nor the producer’s margin or any processing costs of the final material.

Slab recipe
The Stainless Steel Index (SSI) is calculated on the weighted slab components of the corresponding stainless grade. The weights are determined from the region’s average slab recipe. This slab recipe consists of the raw materials that are used for the production of stainless steel in the specified region and the grade.
The specification of each raw material consists of the average chemical analysis, the metallic yield and the relative amount in the overall slab.

The slab recipes are obtained directly from primary market participants in the region’s stainless steel market. The recipes are averaged and recipes with raw material components that deviate more than one standard error from the median component are excluded. The reliability of the obtained average recipe is then confirmed with market participants. Fastmarkets MB will update the information on a bi-annual basis initially but reserves the right to change the frequency at which it updates the recipe according to market demands. Finally, the chemical analysis of the slab is calculated and cross-checked against the grade’s specification.

Steel grade specification
Each of the stainless grade specification contains a maximum amount of 2% manganese (Mn), 0.08% carbon (C), 0.045% phosphate (P), 0.03% sulphur (S) and 0.1% nitrogen (N).

The major components of the grade is given as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>AISI/SAE 304</th>
<th>UNS S30400, DIN 1.4301, EN X5CrNi18-10, “18/8”</th>
</tr>
</thead>
<tbody>
<tr>
<td>% min</td>
<td>% max</td>
<td></td>
</tr>
<tr>
<td>Chrome Cr</td>
<td>18</td>
<td>19.5</td>
</tr>
<tr>
<td>Nickel Ni</td>
<td>8</td>
<td>10.5</td>
</tr>
<tr>
<td>Iron Fe</td>
<td>Balance</td>
<td></td>
</tr>
</tbody>
</table>

Raw material decomposition
The major components Fe, Cr, Ni are decomposed to the raw materials as follows:

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Fe %</th>
<th>Cr %</th>
<th>Ni %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless scrap</td>
<td>68%</td>
<td>63%</td>
<td>65%</td>
</tr>
<tr>
<td>Fe scrap</td>
<td>23%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>FeCr</td>
<td>5%</td>
<td>37%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>LME/FeNi</td>
<td>6%</td>
<td>&lt;1%</td>
<td>35%</td>
</tr>
<tr>
<td>FeSi</td>
<td>&lt;1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Sum          | 100%  |

While the slab recipe determines the physical composition of the produced stainless steel grade, the price is determined by MBs raw component prices.

Fastmarkets MB’s raw components prices
Each index comprises the slab’s components weighted according to their relative input weight into the final slab. The final product is within the specifications of the stainless grade of the index according to the AISI/SAE or similar national specification. The prices used are Fastmarkets MB standard prices. In the index price composition they are adjusted for the component’s contents and market conditions.

The index uses the following raw material prices when determining the index’ final price:

- Steel Scrap Stainless 18/8 solids, USD/metric tonne
- Ferrous scrap Rotterdam export shredded fob Rotterdam, USD/metric tonne
- Ferro-chrome 6-8% C basis 60% Cr max. 1.5% Si major European destinations $ per lb Cr, USD/pound
- Ferro-chrome lumpy Cr charge, basis 52% Cr quarterly major European destinations $ per lb Cr, USD/pound
- Nickel Metal Europe uncut cathodes premium indicator in warehouse Rotterdam, USD/metric tonne
- Nickel Metal Europe 4x4 cathodes premium indicator in warehouse Rotterdam, USD/metric tonne
- Nickel Metal Europe briquettes premium indicator in warehouse Rotterdam, USD/metric tonne
- Ferro-silicon lumpy basis 75% Si (Scale pro rata) major European destinations, EUR/metric tonne
- Ferro-manganese basis 78% Mn (Scale pro rata) – Stand. 7.5% C major European destinations, EUR/metric tonne
- Molybdenum Drummed molybdic oxide Free market $ per lb Mo in warehouse, USD/pound
- Europe domestic grade 304 stainless steel cold rolled sheet (2mm) ex-works, EUR/metric tonne
- Nickel Cash-USD/MT-LME
- Nickel 3 Month Forward-USD/MT-LME
- Molybdenum Cash-USD/MT-LME

Calculation of individual index component prices
The Fastmarkets MB Stainless Steel Index uses various raw material prices when determining the final price of the index. These prices used are widely recognised industry standards from Fastmarkets MB and the London Metal Exchange.

The individual prices used are each calculated to individual specifications using set methodologies. The following prices are assessed by Fastmarkets MB in line with published Fastmarkets MB Pricing Principles:
Fastmarkets MB pricing principles
The principles for all Fastmarkets MB prices, whether assessed ranges or indices, are the same. They involve the detailed canvassing of buyers and sellers at set periods by reporters who specialise in the markets they are pricing.

Fastmarkets MB, which is completely impartial and independent, engages with all sides of the market, including sellers, buyers and traders. The goal of Fastmarkets MB reporters is to discover at what level market participants have concluded business, made offers or received bids over a certain defined period, which is generally the period since the conclusion of the previous price quotation. In addition to reported business - and most particularly when no business has been transacted - Fastmarkets MB will weigh bids, offers and assessments of the market by participants.

London Metal Exchange Prices
The below prices are priced by the London Metal Exchange and conform to all the published specifications.

Nickel Cash - USD/tonne - LME
Nickel 3-Month Forward - USD/tonne - LME
Molybdenum Cash - USD/tonne - LME

Price conversions
Prices in currencies other than USD are converted using the official closing FX rate, as provided by Oanda.com. Prices in units other than tonnes are converted to tonnes with the highest available precision. Price sources with a higher frequency than the index update frequency are averaged to match its weekly update frequency. As an example, the LME’s daily nickel prices are averaged over one week to match the weekly Fastmarkets MB Stainless Steel Raw Materials Index.

Publication
The Fastmarkets MB Stainless Steel Index is published every Monday at 4pm London time. Indices are not published on England and Wales public holidays,* which are as follows:

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

*source: www.gov.uk

Where public holidays occur on a Monday, the index 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 uses 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 timeframe 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 methodologies in consultation with industry participants, with the objective of adopting product specifications and trading terms and conditions that reflect and are representative of typical working practices in the iron ore industry.
Fastmarkets MB reviews its methodologies every six months. If market changes necessitate more frequent changes, Fastmarkets MB will implement its formal review process in line with its published consultation process.

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 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.

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 periodic review of the methodology and details of the consultation process to propose changes to the methodology, refer to Fastmarkets MB’s Methodology Review & Consultation Process available on Fastmarkets MB’s website.

Procedure to ensure consistency in the price-discovery procedures
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 Complaints 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 or input errors or incorrect application of the methodology.

To minimise as much as possible the inconvenience to our subscribers, Fastmarkets 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 will publish a correction of a price only where it has established that undeniably there has been an error. Fastmarkets 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 continually seeks to increase the number of market sources willing to take part in the price discovery process. Fastmarkets’ principal requirement is that contributors are active participants in the spot market. Fastmarkets Group’s Data Submitter Policy provides guidelines defining the high level of data quality and integrity that is expected from a contributing organisation providing pricing data. The policy can be found on Fastmarkets’ 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 pricing, or have questions or comments about the methodology and price specifications, please contact the Fastmarkets stainless steel team.

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