

CRU Prices

Mixed Hydroxide Precipitate (MHP)

Methodology and Definitions Guide

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Methodology and Definitions Guide – Mixed Hydroxide Precipitate

1 Scope

This guide covers Mixed hydroxide precipitate (MHP) pricing in China and should be read in conjunction with the CRU Group Compliance Framework and Methodology Guide. It details commodity-specific methodology which has precedence, with all other aspects covered by the Group methodology guide.

2 Methodology

Mixed hydroxide precipitate (MHP)

The CRU Mixed Hydroxide Precipitate (MHP) price is a monthly (once every month) assessment expressed as a percentage of nickel payables based on the London Metal Exchange (LME). The price assessment will be provided as a range. This range represents transactions or other price information in the physical spot market.

The methodology prioritises transaction prices and other methodological rules with limited but necessary application of expert judgement, detailed below, in order to produce a price that benefits from rigour, and analyst expertise and discretion in equal measure.

Data providers

CRU MHP price assessments are based on regular contact with a wide network of market participants including producers and consumers. This network is frequently reviewed to ensure a balance of buyers and sellers. A Non-Disclosure Agreement may be supplied as required.

Above and beyond the criteria stipulated in Section 3.4 of the CRU Group Compliance Framework and Methodology Guide, each data provider must exist on a list of approved data providers before their data can be considered for admission into published prices.

Data submitted and submission process

Transaction data is prioritised as an input and to that extent the hierarchy of acceptable price types follows that described in Section 3.1 of the Group Compliance Framework and Methodology Guide.

In the absence of actual transaction data, the following types of price data may be submitted in the same period: a firm/indicative offer or bid; opinion of the prevailing market price.

Data Providers should provide accurate spot price data to CRU detailing date and type of price data, according to CRU's MHP definitions below.

Admissible price data is limited to business concluded at arms-length. This means the trade must be between companies who are substantially unrelated in ownership and/or where the transaction is not part of any arrangement to guarantee the long-term security of supply, such as an off-take agreement or participation in joint ventures in MHP supplying operations. This therefore necessarily excludes intra-company transfers, as well as shipments to or from joint-venture partners.

Data Providers are to provide CRU with one or more single price figures, each relating to an individual spot deal (a sale or a purchase) concluded between 14:00 on Friday of the week prior to publication and 14:00 UK on the Friday of publication. In the absence of actual transaction data, firm or indicative bids/offers or an opinion of the prevailing market price in the same period can be submitted. The type of price data submitted (actual transaction, firm or indicative bid/offer or opinion) should be indicated to CRU.

Industry participants can submit prices to CRU by telephone, email, private one-to-one instant messenger services or other private means of communication. Information must be submitted to CRU by 14:00 UK time on Friday if it is to be eligible for admission to the monthly MHP assessment published later the same day.

Final Price Assessment

Normalisation

The final price is assessed based on all data received by all permissible means. Data which meet the precise definitions below are eligible for admission without any transformation. Data which do not will be subject to a normalisation process in order to adjust for delivery basis etc.

Exclusion of outliers

An analyst may use expert judgement in the exclusion of a data point as an input to the calculation of the final price. In doing so they would consider: the range and distribution of data collected in the same timeframe from other data providers; previous data received from the same data provider; non-price information received from the data provider; market state and direction information from any other source. Inclusion or exclusion of input data in the final price is explicit and recorded.

Final assessment calculation Process

The high and low values of the published price range are established as follows:

1. All data points submitted are assessed against admissibility criteria in the relevant product specification and the criteria stated in this methodology.
 - a. Data points which meet the criteria without normalisation are determined as admissible.
 - b. Data points that require normalisation and can be normalised are normalised, and the resulting data determined as admissible.
 - c. All other data points are rejected as inadmissible and will not be used in subsequent price evaluation.
 - d. Of the data points that remain, outliers (defined above) may also be rejected as inadmissible if they otherwise do not meet acceptability criteria.
2. Expert judgement is used to establish the high and low values of the published price range by reference to the distribution of admissible data points around the mid-point and values of the lowest and highest data admissible points, in the current and prior assessment periods. Metrics such as the standard deviation may be used as a guide to this process, but not as a sole determinant of the range. This means the high and low of the published range are not necessarily set equal to the highest and lowest admissible data points because to do so would: a. Introduce excessive volatility in the high and low of the published range over time. b. Define the range by individual deals which may carry little volume weight and ignore other admissible data points.

Price determination with no qualifying data points, zero submissions or in an illiquid market

In the case of no qualifying data points, an illiquid market or zero submissions, where submissions, if any, were deemed inadmissible or otherwise where received data is judged insufficient, expert judgement would be used to determine the final benchmark values.

This choice would be based on: observation of the previous price; short term historical price trends; other quantitative market data including prices in other related active markets, producer price change announcements; qualitative information such as that received from interactions with market participants or other CRU analysts, and; other sources of information relevant to the spot market. The price assessor will use their judgement to evaluate the volume, quality and coherence of any such market information they may possess. If one or more of these factors in combination does not provide a sufficiently clear indication of the direction and extent of market movement to allow the price assessor to confidently change the benchmark from the previous value, the prior value would be rolled over to form the current period value.

Expert judgement

Expert judgement may apply to decisions on whether price data submitted relate to actual deals concluded, if normalisation of price data submitted is required and the means of any normalisation, and the inclusion of a data point in calculation of the final price.

An analyst will consult with one or more colleagues before any application of expert judgement if in any doubt or where collective input would improve the quality of a judgement.

Consistency in the application of expert judgement is achieved through a combination of selection, formal and informal training and review, supervision and control processes as detailed in section 2.5 of *the Group Compliance Framework and Methodology Guide*.

Final publication

Before publication, the final price will be verified by a second analyst. CRU MHP prices are published monthly at 16:00 UK time. on the second Friday of the month and made available via FTP data feed and DataLab.

Deactivated prices and changes

A price assessment will remain active as long as there are sufficient buyers, sellers and/or traders for the analyst to make an accurate assessment. If the quotation suffers from limited transparency or if business dynamics change, it may be deactivated following market consultation. Its history will still be available, but no further information will be collected for that assessment from the time it is deactivated.

If you have comments or questions about the methodology used by CRU to assess prices, or questions about particular prices, please email ellie.wang@crugroup.com or customer.services@crugroup.com.

To find out more about CRU's pricing products and services go to www.crugroup.com.

3 Definitions – Mixed hydroxide precipitate (MHP)

Details

Any price data provided to CRU must meet the relevant product definitions. Data Providers will provide CRU with a single price figure relating to all spot sales or purchases concluded in the week/s prior to publication. In the absence of actual transaction data, bids/offers in the same period can be submitted. The type of price data submitted (actual, transaction, firm bid/offer) must be indicated to CRU.

Mixed Hydroxide Precipitate, China 30-40% Ni, 1-6% Co, CIF

DataLab Name:	Mixed Hydroxide Precipitate, 30-40% Ni, 1-6% Co, Spot price; China, CIF
Grade:	30-40% Ni, 1-6% Co
Price basis:	CIF China
Credit/Payment terms:	Bank acceptance (other payment normalized)
Loading Location:	Producer plant
Type:	Spot - Assessed
Unit:	% of LME nickel price
Size:	Min lot size 100t Ni metal
Timing:	No more than 4 weeks forward
Main Consumer Markets:	China
Pricing:	Business reported by sellers to buyers – no inter-trade activity
Duties/Tariffs:	VAT included; any other duties excluded
Frequency:	Monthly