

Shanghai Metals Market Price Assessment Methodology

0#/1# Zinc Spot Price

Product: 0#/1# Zinc Spot Price

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1. Guidelines to SMM price assessment methodology

Shanghai Metals Market (“SMM”) is an independent service provider that does not participate in trades. SMM is a market observer that engages buyers and sellers in the commodities market. By consulting with industry independent participants, SMM drafts the methodology, examines and revises it regularly based on the specifications and terms of trade that are generally used in the market, with equal weighting given to transactions that meet the standards. SMM attaches equal importance to normal transactions that meet the specifications and standards. SMM reserves the right to exclude from its price assessment any price data information deemed to be less reliable or unrepresentative.

SMM publishes spot metals prices (or indices, etc., including markets in China or outside of China) on a daily basis, commonly referred to as SMM prices. SMM has formulated corresponding methodologies for the published SMM prices, which have been published on SMM's official website www.smm.cn for reference. The methods and procedures for the formation and release of SMM prices are specified in these methodologies, and SMM prices are formed and released in strict accordance with the regulations of these methodologies.

To reflect the actual trades in the spot market, SMM will update the methodology for SMM price assessments and publish all the revisions on our website www.metal.com (English) or www.smm.cn (Chinese) 28 days ahead of the changes. For queries or suggestions on the methodology, please contact SMM customer services (please find contact information on the SMM official websites). **Please read this paragraph in conjunction with the SMM Methodology Review and Change Policy, and the SMM Complaint Policy.**

This document specifies the standards and management methods for the 0#/1# Zinc Spot Price assessment. These standards are formulated to establish a transparent and verifiable SMM price setting mechanism and provide market participants with an important pricing indicator.

The Committee maintains oversight of the SMM Benchmark methodology and its compilation process, ensuring that SMM prices and indexes reflect as closely as possible the objective conditions of physical markets of relevant commodities. The Committee will immediately point out any problem it finds, and propose external consultations and modifications to the existing methodologies or processes, in order to improve the quality of prices or indices published by SMM. The Committee can only propose changes to the methodologies and processes used in future Benchmark assessments, rather than modifying the already published prices or indexes.

2. Guidelines to 0#/1# Zinc Spot Price

2.5 Definition

The SMM zinc ingot (#0 and #1 zinc, hereinafter referred to as zinc ingot) spot prices are assessed and reported based on the methodology defined in this document. As a benchmark, it can be referred to by parties in upstream and downstream spot market and traders in the spot zinc ingot market as their settlement price. The prices reflect the price range that is most likely to be traded in Shanghai at the time of publication (self pick-up at warehouses) on each complete trading day. The prices are mainly based on spot transaction prices in Shanghai spot market on the same day.

2.6 Introduction of price assessment

SMM collects data information used to evaluate zinc ingot spot prices by means of standard acquisition (that is, the collection of raw data information that complies with the SMM Data Standards Policy), from including the actually traded price of spot transaction provided by the price submitters. The amount of each transaction that can be deemed as the standard zinc ingot spot prices or trades in the price collection will be not less than 30~50 mt. Data collection, assessment (calculation) and daily management of SMM zinc ingot spot prices are conducted by the SMM zinc business team, which consists of 2 price analysts (A and B) and a price manager. Analyst A is in charge of price collection from price submitters and eventually determining prices, analyst B rotates the job of analyst A. Price manager is in charge of reviewing the price assessment process.

The Price published by SMM is intended to reflect the real transactable value of a commodity in a time point or period during the day. As such, where a confirmed deal is done

for the same specification and loading range as confirmed bids and offers, and when all are declared to the market simultaneously, the deal will take precedence over the bids and offers. During the assessment process, we may consider other information. However, actual transactions, bids and offers will always take precedence. Please read this paragraph with the SMM Benchmark Guidelines on Hierarchy of Data Inputs.

2.7 Source of raw price data

2.7.1 Collecting from price data submitters

Please note that the following standards and procedures need to be read together with the For more information, please refer to the Submitter Exclusion or Inclusion policy.

2.7.1.1 Criteria for price data submitters

SMM will select representative market participants from the industry chain as targeted price submitters for SMM zinc ingot spot price assessment (data providers, including smelters, traders and downstream users).

SMM will take reasonable care to determine and verify the authenticity and reliability of price provider. The procedure SMM adopts is designed to minimise the risk of using any abnormal price data and oppose any manipulation of the Benchmark.

The SMM policy includes, but is not limited to, steps to take as follows:

- Collect relevant public domain documents (such as business licenses) for each price submitter and verify the authenticity of the documents.
- Ensure that each price submitter engages in the transaction, procurement, sales or production zinc ingots industry chain.

SMM will ensure that each employee who is designated as the contact of the contributor has the right to directly access the relevant data in the company, and has the necessary authority and capability to submit the data to the price analyst of SMM in a timely manner.

SMM will validate the reputation of each contributor by communicating with other reputable market participants.

2.7.1.1.1 Criteria for smelters

- a. Smelters should have zinc ingot capacity of above 100,000 mt on an annualised basis; conduct standardised transactions smoothly across channels with stable sales performance; possess operational integrity, and enjoy good reputation in the market, in the view of SMM.
- b. Smelters should provide objective and honest feedback on their zinc ingot production and sales, including output, operating rate, quality of the product, sales price, sales volume, buyers and inventory, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.
- c. Smelters should have a sound understanding of and insight into the macro economy,

current status of zinc industry and trades of the zinc market, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.

2.7.1.1.2 Criteria for traders

- a. Traders should least have over two years of experience in zinc ingots spot trading with an annual purchasing or sales volume of above 100,000–150,000 mt, conduct standardised transactions smoothly across channels with stable purchasing and sales performance and possess operation integrity, influence and reputation in the market.
- b. Traders should provide objective and honest feedback on their zinc ingot procurement and sales, including quality of the product, prices and volumes for purchase and sales, procurement sources, buyers, and inventory, and be able to keep good contact with SMM Operational Teams accordingly.
- c. Smelters should have a sound understanding of and insight into the macro economy, current status of zinc industry and trades of the zinc market, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.

2.7.1.1.3 Criteria for downstream users

- a. Downstream users should have an annual zinc ingots purchasing volume of above 50,000–100,000 mt, conduct standardised transactions smoothly across channels with stable purchasing performance and possess operation integrity, influence and reputation in the market.
- b. Downstream users should provide an objective and honest feedback on their zinc ingots procurement, including quality of the product, purchase prices and Price, procurement sources, and inventory, and be able to engage well with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.
- c. Smelters should have a sound understanding of and insight into the macro economy, current status of zinc industry and trades of the zinc market, and be able to engage with SMM Operational Teams in accordance with the SMM Benchmark Submitter Code of Conduct.

2.7.1.2 Formation and adjustment of the price submitter list

SMM selects price contributing companies based on the above criteria to produce a stable list. SMM signs a formal agreement with each price contributing company to ensure the accuracy and timeliness of the data provided as well as protect confidential information of the price submitter. At the same time, SMM will protect the corporate secrets of the contributors. SMM arranges a full-time price analyst to collect the information, and communicates regarding the market situation related to price information. SMM will continuously evaluate

each contributor according to the above criteria, and adjust the list of contributors based on the evaluation results. For contributors whose evaluation results do not meet the above standards, SMM will notify them to rectify within a time limit and exclude them from the list for the time being. If the contributor refuses to rectify or does not meet the standard after rectification within 30 days after the rectification notice is issued, SMM will terminate its qualification as a contributor.

The updated list of price submitters is as follows:

Company type	Company Name
Trading	Shanghai Jingsheng Metal Material Co., Ltd.
Downstream	Weifang Aolong Zinc Industry Co., Ltd.
Smelter	Hanzhong Zinc Co., Ltd.
Smelter	Yunnan Xiangyun Feilong Resources Recycling Technology Co., Ltd.
Smelter	Huludao Zinc Industry Co., Ltd.
Trader	Shanghai Aoyuan Metal Materials Co., Ltd.
Smelter	Anhui Tongguan Nonferrous Metals (Chizhou) Co., Ltd.
Trader	Huayi (Shanghai) Industrial Co., Ltd.
Trader	Shanghai Haicheng Goods &J3T; Materials Co., Ltd
Smelter	Yunnan Luoping Zinc & Electricity Co., Ltd.

Downstream	Tianjin Youfa Steel Pipe Group Co., Ltd. the first subsidiary
Smelter	Western Mining Co., Ltd.
Smelter	Yunnan Chihong Zn & Ge Co., Ltd.
Smelter	Henan Yuguang Zinc Co., Ltd.
Smelter	Shaanxi Zinc Co., Ltd.
Trader	Shanghai Maoyuan Industry Co., Ltd.
Smelter	Yunxi Wenshan Zinc Indium Smelting Co., Ltd.
Smelter	Jiangxi Copper Lead-Zinc Metals
Downstream	Weifang Longda Zinc Industry Co., Ltd
Smelter	Sichuan Hongda Co., Ltd.
Smelter	Zhuzhou Smelter Group Co., Ltd.
Smelter	Bayannaoer Zijin Nonferrous Metals Co., Ltd.
Trader	Shanghai Jinke Metal Trading Co., Ltd.
Smelter	Shenzhen Zhongjin Lingnan Nonferrous Metals Co., Ltd. Danxia Smelter
Smelter	Nandan County Nanfang Nonferrous Metals Co., Ltd.
Smelter	Chifeng CNMC Zinc Co., Ltd.

Downstream	Ningbo Aluminum Billion Alloy Materials Co., Ltd.
Smelter	Sihuan Zinc & ZnS; Germanium Technology Co., Ltd.
Downstream	Jiangsu Guoqiang Galvanising Industry Co., Ltd.
Smelter	Inner Mongolia Xing'an Copper-Zinc Smelting Co., Ltd.
Trader	Sanshui Industrial Co., Ltd.
Smelter	Yuanling Shanneng Environmental Protection Technology Co., Ltd.

Notes: These companies are in no particular order. SMM will amend the list based on the selection criteria in this document. Data providers will not receive incentives, rewards or benefits from SMM for providing data.

2.7.1.3 Process of price data collection

SMM's Operational Teams will collect zinc ingot spot price data from price submitters by means of phone, fax, email, QQ, WeChat and other forms of communication between 9:15 –10:10 China Standard Time ("CST") on every trading day. (Price data that are submitted after 10:10 CST will not be included in price assessment on the day, while data that does not contain the required minimum information details will not be included either, even if the data are submitted before the deadline) The data will include traded prices within the day, and the most likely traded prices, bids and offers. All communication content on instant messengers, WeChat messaging and emails as well as face-to-face communication will be recorded, while phone communication via phone calls will also be recorded in summary and input into the database. Price data must be a typical, repeatable transaction between unaffiliated market participants (completely financially and legally independent).

SMM's Operational Teams shall abide by business ethics while reporting to their manager about any threat by market participants or any offer and bid that could undermine or influence the assessment during the price collection process.

Price data provided by the submitters to SMM should include at least the following kinds of information. Price analysts should encourage the price submitter to report as much detailed information as possible, not just the minimum requirements specified:

Zinc ingot specifications

Zinc ingot Zn99.995: Commonly called “0# zinc ingots” in the industry, which meet ZN99.995 zinc ingots specified in the national standard GB/T 470–2008. The zinc content is not less than 99.995%. Zinc ingot Zn99.99: Commonly called “1# zinc ingots” in the industry, which meet ZN99.99 zinc ingots specified in the national standard GB/T 470–2008. The zinc content is not less than 99.99%. The details are as follows:

Specification	Chemical composition (mass fraction)/%							
	Zn not less than	Impurities not greater than						
		Pb	Cd	Fe	Cu	Sn	Al	Total
Zn99.995	99.995	0.003	0.002	0.001	0.001	0.001	0.001	0.005
Zn99.99	99.99	0.005	0.003	0.003	0.002	0.001	0.002	0.01

Zinc ingot brands

The main distribution brands of zinc ingot spot are Shuangyan zinc, Qin zinc, Yuguang zinc, Huize zinc, Baiyin zinc, etc.

Transaction price/counter offer/offer, etc.

It can be a specific price number, or it can be shown in the form of the SHFE next month zinc contract + premiums/discounts. The unit of pricing is yuan/mt, without decimal point.

Volume

Minimum volume of 30 mt

Delivery site

Mainstream warehouses in Shanghai. Normally, there are no premiums or discounts for different warehouses in the same location.

Payment terms

Payment terms in the negotiated transaction agreement, such as bank remittance, acceptance bills, etc.

2.3.2 Collecting price data from other submitters

SMM's policy on collecting market information and data is that SMM welcomes all information from various sources or organisations, as long as the data submitter provides them for good faith and authentic purposes. However, the data submitter is required to accept the SMM code of conduct on data submitters. SMM does not accept instant messaging

requests from unidentified individuals. SMM price analysts are required to confirm the identity of market participants at least in accordance with the procedures specified in 2.3.1.1 before conducting instant messaging communication with the data submitter.

2.8 Detailed formation process and related regulations

2.4.1 Data collection

SMM Price analysts will collect price data and information based on the standards mentioned above. And a preliminary raw dataset is finally generated after taking into account major factors, such as offer levels, trading situations in the spot and futures markets, macroeconomics, market transactions, supply and demand, inventory levels, and other major political, economic, and natural factors.

2.4.2 Data normalisation

SMM price analysts will normalise the preliminary data results, and the finalised prices will be in the form of the range of discounts or premiums against the corresponding SHFE next-month zinc contract prices. (selection of futures contract as benchmark: futures contract that is referred to by more than 70% of mainstream offers and transactions is deemed as the benchmark contract for price assessment on the day)

The price data will be recorded both electronically and in writing. All electronic and written records are archived by analysts and kept at least five years in a secure network environment and physical environment. For more details, please refer to the SMM Recordkeeping Policy.

2.4.3 Information data analysis, verification and screening

SMM will always endeavour to confirm bids, offers and deals information with related parties. SMM will endeavour to verify all the market data obtained by the buyer/seller with the counterparty of the buyer/seller. SMM will perform multi-party verification on information provided by the buyers/sellers with their counterparties, and will cross-validate with other relevant participants if the buyers and sellers are unable or unwilling to provide the information.

SMM will exclude any questionable, irreproducible or apparently abnormal quote and transaction in the price evaluation process, and note the reason for removal in the original data set, which will also be kept at least five years. For example: A certain company has no spot transaction or quotation, but still gives a single-day price suggestion. A certain transaction price is obviously high due to special circumstances or special services. A certain company's quotation is intentionally high due to the company's special internal sales plan or policy. A certain company deliberately issues its bids in advance out of a prediction of the market. A certain company did not communicate effectively on that day.

SMM ensures that only transactions and quotes made between financially and legally

independent parties will be included in the price evaluation process. SMM price analysts will compare and analyse data submitted by SMM price submitters, verifying whether the prices show trends that run counter to the wider market.

If any unusual submissions are found, SMM Price analysts need to investigate them. The SMM Price analysts will re-contact the price submitter to verify the accuracy, applicability and completeness of the submitted data. If it is confirmed that it is due to an error in the submission process, such as an input error, etc., SMM will correct the error and re-validate and screen. If there is no error in the submission process, it can be concluded that the data submitted by the price submitter is not a qualified data and needs to be removed from the original data set.

Finally, SMM will obtain a final data set based on the calculation model, and it will exist in the form of absolute price.

Minimal subjective judgement from analysts is required in the SMM price evaluation process. The established standards and procedures will be applied to manage the actions taken by SMM price analysts in screening the collected data, and to evaluate the data included in the price assessment is valid or if the abnormal data has been excluded. The experience of SMM price analysts in the zinc ingot trading market is to ensure that only data that meets clear methodological requirements can be included in the price evaluation process. After screening the original data set and removing disqualified data, SMM price analysts will not have any subjective judgment about the normalised data or the price assessments.

The SMM Benchmark Management Committee regularly reviews the implementation of these procedures to ensure compliance with its published standards. To attain the highest possible standards, SMM Price analysts are trained and regularly appraised in their respective markets in which they are responsible for assessing prices. This ensures that SMM analysts follow the requirements of the methodology in a consistent manner.

2.4.4 Evaluation of published prices (calculation)

The preliminary spot price range is based on the current price of the next-month zinc contract on the Shanghai Futures Exchange (SHFE) at 10:15 CST plus premiums or discounts.

SMM will assess a mainstream premium or discount in the analysis, verification and screening of information data. For example, if more than 20 out of 30 price submitters suggest that the premium or discount quotation for the day should be 50 yuan/mt, then SMM will assess the premium or discount for the day at 50 yuan/mt.

After years of tracking and gathering feedback, SMM applies a price-range strategy in assessing spot zinc ingot prices as other strategies have proven unreliable. For example, a tonnage weighted calculation will be easily affected by traded price and volumes. As trading

volumes are unpredictable, price assessments cannot be done if there are no deals. Low trading volumes will also be inaccurate.

2.4.5 Special circumstances

SMM reserves the right to exercise judgments when trading liquidity is thin. We will assessments based on the economy, relationships between products, transportation and forward market if there is a lack of credible or verifiable market information, so as to make sure that the data samples used to evaluate the spot prices are sufficient and accurate. For more details, please refer to the SMM Illiquid Market Management Policy and SMM Expert Judgment Policy.

In addition, SMM will also make a price but moved all the there is only one offer or bid, or when the price difference between offers and bids is too big to assess a tradable price. In these two cases, information of spread trade and mainstream market relationships will also be taken into consideration. SMM will set the assessed price between the highest bid and the lowest offer if information on the offers and bids manage to meet all other requirements set in this assessment methodology.

SMM will not set the minimum trading volumes for the price assessment under circumstances where sparse deals are heard in the market.

2.4.6 Prices publication

The SMM Guangdong zinc ingot spot price assessment is published daily before 10:20 CST on the SMM English and Chinese websites at www.metal.com (English) or www.smm.cn (Chinese), except for weekends and public holidays. The deadline for price collection is 10:10 CST.

The time of the price publication may also be affected by emergencies and force majeure factors, such as power outages and natural disasters. In such cases, SMM will make every effort to inform the market of the delayed publication schedule as soon as possible. **For more details, please refer to the SMM Disaster Recovery Procedures.**

2.4.7 Modification of published prices

If there are any errors (mistake in calculation or errors caused by incorrect operations) after the price is published, SMM will immediately issue a correction statement to reflect the correct price. **For more details, please refer to the SMM Error Correction Policy.**

2.5 Review of key points

2.5.10 Price (product) standard

3 Zinc ingot Zn99.995: Commonly called “0# zinc ingots” in the industry, which meet

ZN99.995 zinc ingots specified in the national standard GB/T 470–2008. The zinc content is not less than 99.995%. Zinc ingot Zn99.99: Commonly called “1# zinc ingots” in the industry, which meet ZN99.99 zinc ingots specified in the national standard GB/T 470–2008. The zinc content is not less than 99.99%. The details are as follows:

Specification	Chemical composition (mass fraction)/%							
	Zn not less than	Impurities not greater than						
		Pb	Cd	Fe	Cu	Sn	Al	Total
Zn99.995	99.995	0.003	0.002	0.001	0.001	0.001	0.001	0.005
Zn99.99	99.99	0.005	0.003	0.003	0.002	0.001	0.002	0.01

2.5.2 Major brands and producers

Huludao Zinc Industry	Huxin
Baiyin Nonferrous	Honglu
Shaanxi Dongling	Dongling
Shanxi Hanzhong Zinc Industry	Shuangyan
Chifeng Hongye zinc smelting	Chifeng
Bayannaer Zijin	Zijin
Zhuzhou Smelter Group	Huoju
Yuguang Gold Lead	Yuguang
Sichuan Hongda Zinc	Cishan
Yunnan Xiangyun Feilong	Feilong
Yunnan Jinding	Cishan
Yuntong Zinc Industry	Tiefeng
Luoping Zinc & Electricity	Jiulong
Zhongjin Lingnan Nonfermet	Nanhua
Hechi Nanfang	Qilin

Note: This list is in no particular order. SMM zinc ingot spot price assessments cover brands that include but are not limited to the above ones.

Reference volume

SMM sets the typical transaction size that reflects market circulation at 30–500 yuan/mt.

2.5.4 Delivery method

Delivered on transaction day, ex-works, by sea, rail or trucks

2.5.5 Payment terms

Bank transfer, received on the same day.

2.5.6 Delivery location

Warehouses in Shanghai

2.5.7 Unit of pricing

Yuan/mt

2.5.8 Format of publishing

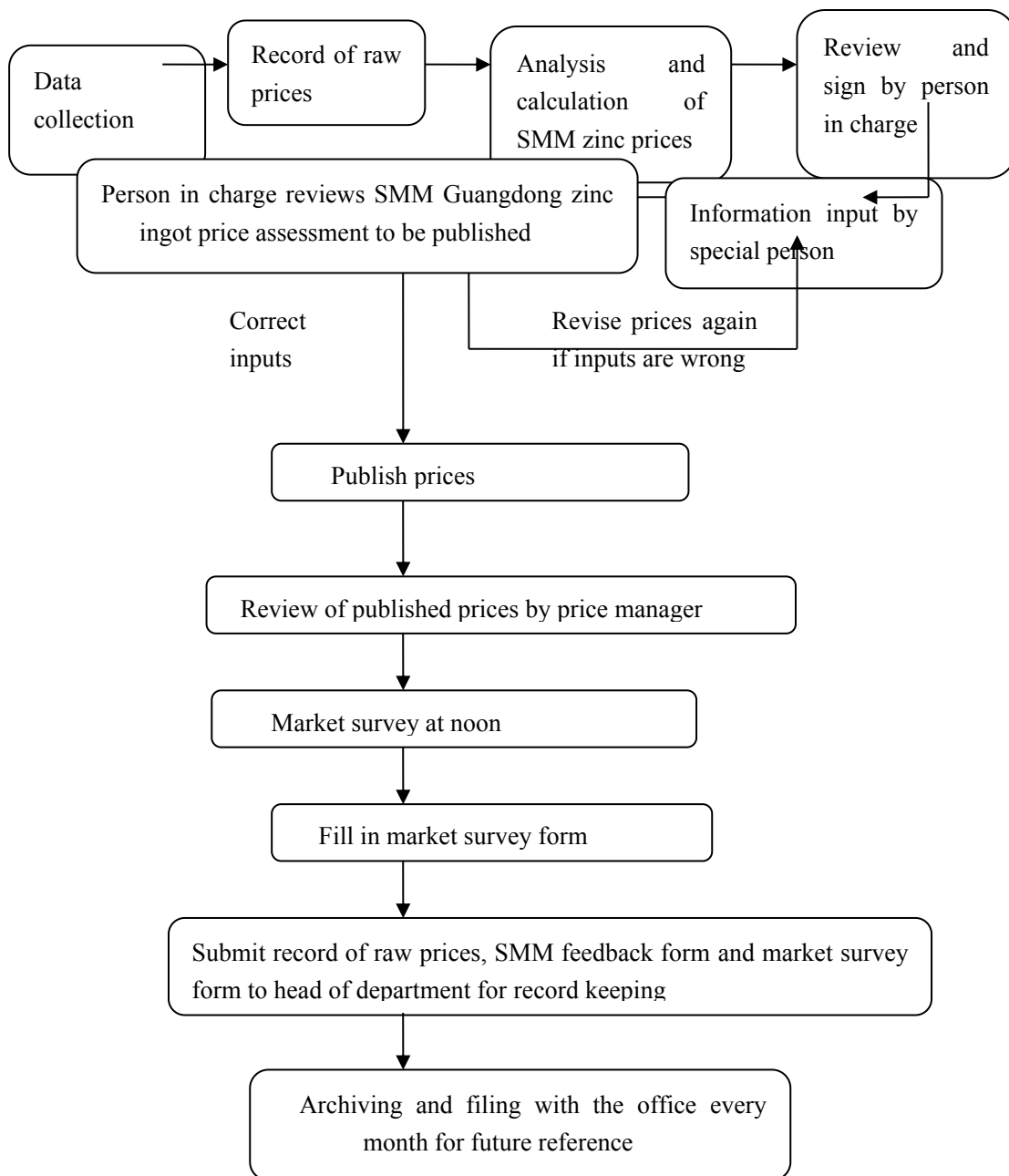
The prices are published as a price range, including 13% VAT.

2.5.9 Publication time

Before 10:20 CST, Monday to Friday (except for weekends and public holidays)

2.6 Price assessment process

SMM undertakes the zinc ingot price assessments between 9:15–10:15 CST on every working day. The detailed process is as follows:



2.7 Adjustment to the price assessment methodology

SMM updates our methodologies on a regular basis to reflect a constantly changing metals trading market. Amendments will be made based on feedback by market participants, and an internal check will be also made regularly. We will follow the external consultation work-flow to amend discrepancies in the methodology that may be less time-sensitive. Major revisions and updates will be published 28 days ahead of the changes, to seek opinions from market participants, unless there are unavoidable and unpreventable circumstances such as natural disasters, war or bankruptcy of the exchange, which will shorten the period. SMM

promises to carefully look into any feedback to the adjustment of the price methodologies, and will amend the methodologies under certain circumstances even if some market participants do not approve of the changes. In addition, SMM has a formal methodology consultation process. SMM promises to arrange an official consultation of the zinc ingots Price Index assessment at least once a year. Dates of the most recent and the next session are at the start of this document. **For more details, please refer to the SMM Methodology Review and changes Policy.**

3. Historical data

This paragraph should be read in conjunction with the SMM Record Retention Policy.

The price of SMM zinc can be checked as early as July 10, 2000.

For information on subscribing to historical price data, please visit www.smm.cn.

4. Compliance with SMM Policies

All SMM employees must comply with the methodologies published by SMM, as well as follow SMM's internal standards and policies. They include the SMM Conflict of Interest Policy, SMM Whistleblowing Policy, SMM Error Correction Policy, SMM Methodology Review, Consultation and Modification Policy, and SMM Complaint Policy.