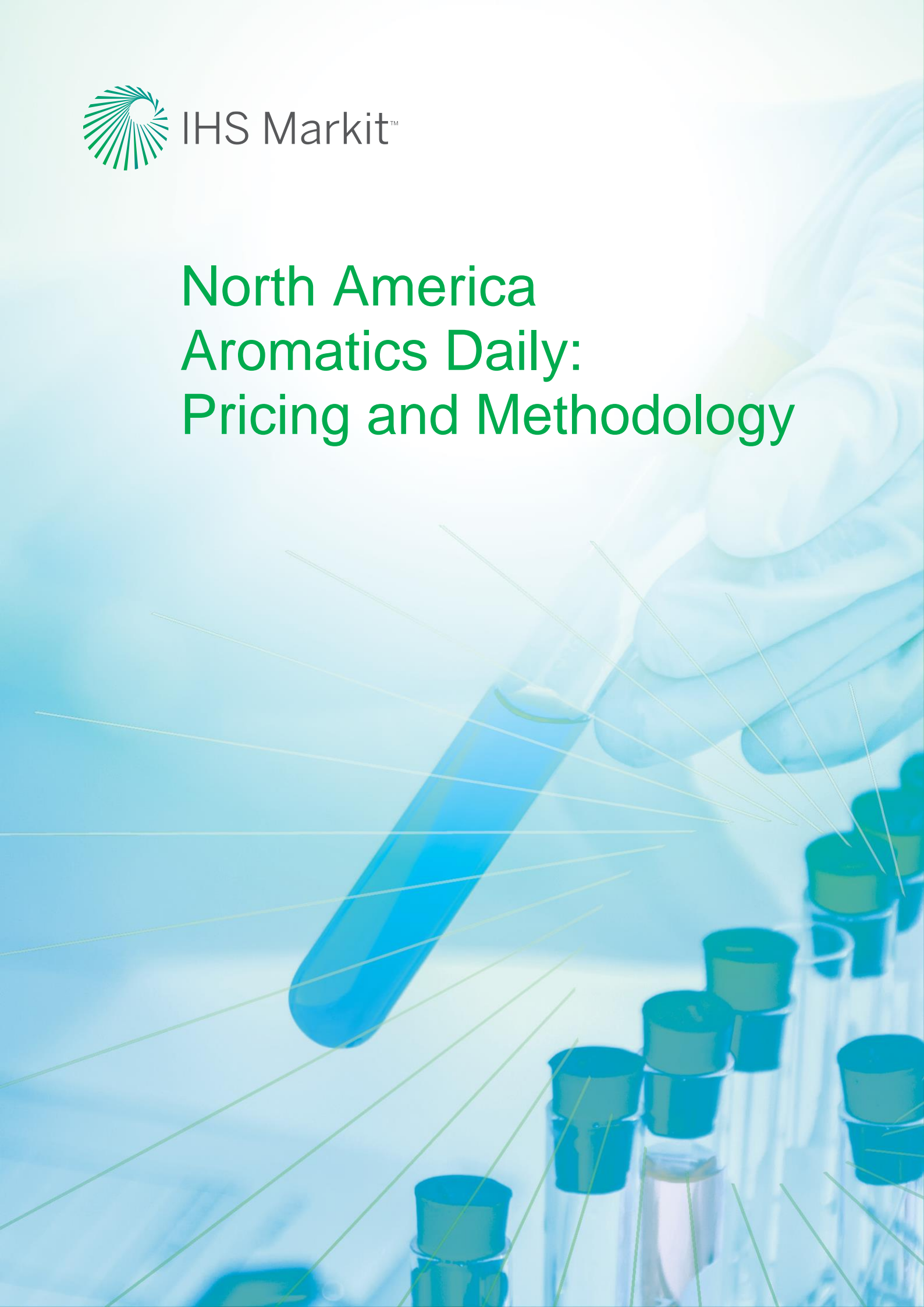




North America Aromatics Daily: Pricing and Methodology



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Overview

This statement of methodology reflects fundamental principles that form the foundation of IHS Markit **Daily North America Aromatics Report**. It includes detailed information on process, data collection, terms and conditions of price acceptance and product specifications.

The overarching goal of IHS Markit daily price assessment is to provide market participants with a trusted and independent benchmark. IHS Markit has no stake in any commodity transactions, is not funded by oil and chemical industry initiatives, and strictly adheres to antitrust guidelines determined by independent legal counsel.

The methodology is continually evolving to reflect changing market realities and IHS Markit takes full responsibility for keeping this statement current.

The IHS Markit North America Aromatics Daily service lists North American daily spot market prices for the following aromatics markets:

- **Benzene FOB/DPP Houston (ASTM D-2359)**
- **Mixed Xylenes FOB/DDP Texas Gulf Coast**
- **Toluene FOB/DPP Houston (Nitration Grade ASTM D-841)**
- **Toluene FOB/DPP Houston Commercial Grade (Does not meet ASTM D-841, but is suitable for gasoline blending)**

All price assessments are subject to compliance with standard trading conditions with regard to **quality, parcel size, loading/delivery ports, laycans and credit terms** as determined by standard market conventions. For IHS Markit standard trading conditions and criteria please refer to the *Methodology Product table*.

Product	Daily	Weekly	Monthly	Currency	Type Contract/Spot	Basis	Location	Delivery Period	Standard Load Size	Unit	Quality	Calculation / Assessment
Benzene M1/Current	x	x	x	USD	Spot	FOB/DDP	Houston	Current month	10,000	BBL	ASTM D-2359/90	Daily methodology doc
Benzene M2/Next	x	x		USD	Spot	FOB/DDP	Houston	Next month	10,000	BBL	ASTM D-2359/90	Daily methodology doc
Benzene M3/Third	x			USD	Spot	FOB/DDP	Houston	Third month	10,000	BBL	ASTM D-2359/90	Daily methodology doc
Benzene Daily rolling Spot Avg	x		x	USD	Spot	FOB/DDP	Houston		10,000	BBL	ASTM D-2359/90	Daily methodology doc (25th previous month to 24th current month)
Nitration-Grade Toluene M1/Current	x	x	x	USD	Spot	FOB/DDP	Houston	Current month	10,000	BBL	ASTM D-841	Daily methodology doc
Nitration-Grade Toluene M2/Next	x			USD	Spot	FOB/DDP	Houston	Next month	10,000	BBL	ASTM D-841	Daily methodology doc
Nitration-Grade Toluene M3/Third	x			USD	Spot	FOB/DDP	Houston	Third month	10,000	BBL	ASTM D-841	Daily methodology doc
Nitration-Grade Daily rolling Spot Avg	x			USD	Spot	FOB/DDP	Houston				ASTM D-841	Daily methodology doc (25th previous month to 24th current month)
Nitration-Grade weighted Spot Avg	x			USD	Spot	FOB/DDP	Houston				ASTM D-842	
Commercial-Grade Toluene M1/Current	x	x	x	USD	Spot	FOB/DDP	Houston	Current month	10,000	BBL	Does not meet ASTM D-841 but suitable for gasoline blending	Daily methodology doc
Commercial-Grade Daily rolling Spot Avg	x			USD	Spot	FOB/DDP	Houston				Does not meet ASTM D-841 but suitable for gasoline blending	Daily methodology doc (25th previous month to 24th current month)
Mixed Xylene M1/Current	x	x	x	USD	Spot	FOB/DDP	TXGC	Current month	10,000	BBL	ASTM D-5211	Daily methodology doc
Mixed Xylene M2/Next	x			USD	Spot	FOB/DDP	TXGC	Next month	10,000	BBL	ASTM D-5211	Daily methodology doc
Mixed Xylene M3/Third	x			USD	Spot	FOB/DDP	TXGC	Third month	10,000	BBL	ASTM D-5211	Daily methodology doc

Product	Daily	Weekly	Monthly	Currency	Type Contract/Spot	Basis	Location	Delivery Period	Standard Load Size	Unit	Quality	Calculation / Assessment
Mixed Xylene Daily rolling Spot Average	x		x	USD	Spot	FOB/DDP	TXGC				ASTM D-5211	Daily methodology doc (25th previous month to 24th current month)
Mixed Xylene weighted Spot Avg	x			USD	Spot	FOB/DDP	TXGC				ASTM D-5211	

Daily Price Discovery Process

The North American price assessment methodology seeks to capture full day transactions, bids and offers for spot market **benzene, toluene, and mixed-xylenes**. IHS Markit chemical market analysts will proactively poll market participants via electronic instant messaging (such as ICE Chat, Eikon, Yahoo), email, telephone or face-to-face conversation for price data throughout the standard trading day.

Analysts will always attempt to collect data from a broad cross section of the North American aromatics sector, including producers, consumers, traders and brokers, so that IHS Chemical is not reliant on one source for data.

In order to meet publication deadline, IHS Markit reserves the right not to include transactions received **after 4pm** Central Standard time for consideration in the day's final price assessment process or the revision process. Information received beyond this time will be used at the analyst's discretion only.

Market participants are encouraged to report transactions, **real-time** bids and offers and live market bid-offer ranges directly to IHS Markit. The expressions of bids and offers are regarded as open and executable to the **market at large**. IHS Markit will attempt to gather as much price information from the marketplace as possible and from as many sources as it can, so that data is not being provided from any one source. IHS Markit reserves the right to **re-publish** via instant messaging platforms the market information collected, and closely track the evolution of indicative values throughout the business day. All data collected is **time-stamped** and **archived** for review.

Price Assessment Laycans

IHS Markit tracks market activity throughout the North American business day to derive an assessment of spot market prices levels for specified delivery/loading laycans. Based on 'normal' regional market activity, the following laycans will be assessed:

Benzene: Month 1 (M1), Month 2 (M2) and Month 3 (M3).

Mixed Xylenes: Month 1 (M1), Month 2 (M2) and Month 3 (M3).

Toluene: Month 1 (M1), Month 2 (M2) and Month 3 (M3).

On any given day Month 1 refers to the current month, Month 2 = current month +1 and Month 3 = current month + 2.

Price Assessment Criteria

IHS prices are assessed based on the range of confirmed physical deals transacted and reported during the North American working day for the relevant month of assessment. Where only one deal has been confirmed, then that will form the price assessment for the day. Where there is a range of deals for the same month, the lowest and highest traded values will form the

range. *On occasions where there is extreme price volatility or severe illiquidity in petrochemical markets, IHS Markit will assess prices at the analysts' discretion as opposed to traded value or last heard notional ranges.*

Highest priority will be given to transactions that are **transparent** and open to any **reputable counterparty** with proper financial and logistical resources. For a deal to be used in the price assessment, it must be confirmed by a source that has been vetted and deemed an approved market source for the product in question by IHS Markit. A good faith attempt will always be made to "confirm" both sides of any transaction (meaning that the buyer and seller in the transaction have been identified and corroborate the price and terms of the sale). Deals of all types that are confirmed to IHS Markit with the stipulation that they are not for wider publication will not be used within the price assessment.

All transactions are to be "physical" product; the sale of "paper" product (meaning a financial arrangement where no physical volume is expected or required to be exchanged) will not be included in the price range.

Any transaction that has logistic restrictions, quality or specification issues, different currency, load size or shipping terms to those specified in the *methodology product table* or any other special considerations will not be used to determine the posted range.

All buy/sell transactions; time and/or location swaps; any transactions having options which could meaningfully impact the commercial value; will be ignored if discovered, regardless of the price assigned.

If a transaction appears to be "out of market" (meaning significantly different in price than would be expected based on other recently confirmed price points), IHS Markit may elect to ignore the transaction. IHS Markit will also review prior expressions of buying and selling interests to examine the circumstances leading to the trade in order to determine the **integrity** of the transaction.

Transactions must be conducted **at arm's length** whereby the buyer and seller are not related in any way by means of share ownership or affiliation in each other's company.

All **bona fide** transactions can be considered for index compilation, regardless of whether it is concluded by a natural buyer (end-user), seller (producer) or trader. If a transaction is identified by IHS Markit or market participants as **anomalous or suspicious**, it will be excluded from the assessment process until the situation can be clarified. This can include **repetitive transactions** between two parties within a single trading session, whereby the parties alternately buy and sell from each other. If it is verified that the transaction is above board by the **next business day**, IHS Markit will retroactively revise its market assessment to include the deal.

On days when there have been no confirmed transactions a "notional" price will be posted. A notional price reflects the consultant's best estimate of price or price range where a transaction could have occurred between an interested buyer and interested seller. The consultant will take into account market direction, momentum, demand and supply as well as the most recent transaction price information and the prevailing range of bids and offers, if any. Highest priority will be given to bids and offers that are **transparent** and open to any **reputable counterparty** with proper financial and logistical resources.

Both **repetitive and incremental** bids and offers that conform to standard market conventions, as well as **retracted** bids and offers, are included for consideration in the IHS Chemical price assessment process.

M3 prices will be posted on the basis of confirmed deals for the month in question as per the assessment criteria of M1 and M2. When there are no confirmed deals or notional bid/offer range for M3, then no assessment will be made. However, if a range was posted the previous day then a range must continue to be posted based on editorial judgement.

Notional postings are indicated by the letter "n" located in the right hand column of the price range in question.

Illiquid Markets

IHS Markit recognizes that petrochemical markets can suffer from periods of illiquidity. In the absence of firm bids, offers and transactions, IHS Markit will still poll market participants for expressions of interest to trade. Due to **tight correlation** between certain markets, IHS Markit also tracks **spread values** in upstream feedstock, downstream products, co-products and alternative products. Other factors that can influence prices, such as supply/demand data, macroeconomic issues and geopolitics will also be

filtered for market clarity. Accordingly, in certain assessments where **insufficient market data** exists, IHS Markit analysts will exercise best judgment to **quantify** these **relative values** in the process of compiling the price index.

In the event that certain markets are shut because of public holidays, IHS Markit analysts may elect to **retain** the marker values published on the previous trading day.

Price Assessment Revisions

Daily price postings are open to revision if additional information becomes available after the close of the business day or outside standard working hours, provided the new information meets the deal assessment/confirmation criteria.

For a revision to be made based on new information being provided after initial assessment, a deal must be confirmed by the buyer or seller involved and must be reported no later than the close of business the next business day.

IHS Markit must be satisfied that the deal was fully representative of market conditions at the time of transaction. Changes or corrections will not be made if a transaction was made under conditions of being Private & Confidential (P&C) – and initially reported as such - but the sale was later disclosed following the publication date of the report. IHS Markit always attempts to be fully diligent in their price discovery and confirmation process and will make every reasonable effort to survey the market. However, prices that cannot be confirmed per the above standards before publication will not necessitate a correction.

Information provided by third parties, including brokers, will not be taken into account for the end-of-day assessment without further confirmation from counterparties.

All postings during the current week are “locked down” at the close of business each Thursday to align with the IHS Markit Global Aromatics Weekly report. The weekly aromatics report captures the trading week from Friday to Thursday and uses daily postings to calculate weekly averages. As a result all daily price postings are locked down on a Thursday and no further revisions can be made for the relevant reporting week.

Corrections or changes to prices may also be initiated if the price range was reported incorrectly due to clerical error or if the price and/or terms were misrepresented or misunderstood. In some circumstances the daily report will be re-issued.

Revised postings are indicated by a red letter "r" located in the right hand column of the price range in question.

Price Assessment Disputes

Every spot price editor at IHS Markit understands that his or her top priority is calling market assessments fairly. Our methodologies are crafted after careful consultation with our customers and applied by our editors to ensure maximum transparency and accuracy.

Still, we understand there may be times when spot price customers wish to question, dispute or comment on a price assessment and/or our methodologies. As a valued IHS Markit spot price customer, you have the right to:

- a prompt reply to any inquiry regarding price assessments and/or methodology within two trading days
- a full consideration by senior IHS Markit spot market personnel of any request for a correction or adjustment of a price assessment as well as any suggested changes to spot price methodology and complete confidentiality.

In the event of an **assessment dispute**, the disputing party should inform IHS Markit of their complaint by the following business day via telephone call, email or instant messaging platforms and all complaints will be acknowledged in writing within one business day. The party should, within one business day, supply IHS Markit with **evidence** of mishandling and/or misinformation of material data that had directly resulted in the distortion of the marker assessment.

The appropriate IHS Markit personnel will reply to complaints with two (2) spot trading days via email. This reply may or may not be a resolution of the complaint but it will acknowledge receipt of the complaint and assure the complainant that he or she can expect an answer in a timely manner.

Upon review and verification of the data, and IHS Markit may then publish a price revision. IHS Markit guarantees complete **confidentiality** of the data provider in the price dispute.

Daily Rolling Monthly Spot Averages

The daily rolling monthly spot price average indexes are only listed in the North American market daily service aromatics report. These are shown for current month benzene, toluene and mixed xylenes and are calculated as straight arithmetical averages of both the daily high and low postings during the period between the 25th of the prior month (or the next trading day after if the 25th is not a trading day) and the 24th of the current month (or the prior trading day if the 24th is not a trading day). The current month indexes are re-calculated each day during the posting period and then locked-down as the current month rolls after the close of business on the 24th. The cycle then continues for the new current month. An eleven month history is also shown.

Daily spot price assessments also form the basis for prices reported in the IHS Markit Weekly Global Aromatics report. Due to the nature of the Weekly report, current month spot prices will continue to be posted in the Daily report up until the last Thursday of any given month, even if the daily spot average for the current month has ceased calculating, therefore any current month prices posted after the 24th will only contribute towards the weekly average calculation and not the daily rolling monthly spot price average calculation.

Methodology Review

IHS Markit price assessment methodology is constantly scrutinized internally for clarity, relevance and comprehensiveness by market analysts and senior analysts across the IHS chemical group. Methodology changes involve a robust polling of the marketplace to ensure all points of view are considered prior to any changes being considered or made.

Internally, all methodologies are reviewed on a quarterly basis, within the Market Daily Service group and records of any proposed methodology change are stated in a central electronic file.

IHS Markit also encourages industry participants to propose improvements or revisions to daily price assessment methodology via e-mail, telephone and instant messaging. Based on the input received, IHS Markit senior leadership within the chemical group will decide whether to accept or reject suggestions made by stakeholders for methodology changes.

Once a spot methodology change is contemplated, IHS Markit will reach out to stakeholders in the form of a formal note delivered via email soliciting feedback on the change.

Feedback may be given via post, email or telephone and the opportunity to comment on any contemplated spot methodology change is open for no less than four (4) weeks and generally not more than six (6) weeks.

In the case of methodology additions, a draft notice is sent out to customers with a deadline for comments set at a maximum of two (2) weeks.

IHS Markit will publish stakeholder comments received with our responses regarding proposed methodology changes on our website and will respect commenter confidentiality when requested.

About IHS Markit

IHS Markit (Nasdaq: INFO) is a world leader in critical information, analytics and solutions for the major industries and markets that drive economies worldwide. The company delivers next-generation information, analytics and solutions to customers in business, finance and government, improving their operational efficiency and providing deep insights that lead to well-informed, confident decisions. IHS Markit has more than 50,000 key business and government customers, including 85 percent of the Fortune Global 500 and the world's leading financial institutions. Headquartered in London, IHS Markit is committed to sustainable, profitable growth.

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