

PIX European Packaging Price Indices



Methodology and specifications – December 2019

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Mission statement

Fastmarkets is a leading commodity price reporting agency (PRA) covering the metals, mining, minerals and forest products industries. Our products include Metal Bulletin, American Metal Market, RISI, FOEX, Random Lengths and Industrial Minerals. 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 FOEX, in Helsinki, Finland, operating under the Finnish law, produces trademarked PIX price indices for selected pulp, paper, recovered paper and packaging grades as well as for wood-based biomass and bioenergy products like pellets, wood chips and wood. The first PIX index was launched in September 1996. Fastmarkets FOEX owns the trade mark rights to PIX Index.

Fastmarkets' staff 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 forest products price reporting team. We have offices in New York, Boston, Oakland, Eugene, Charlottesville, Atlanta, Brussels, Helsinki, Beijing, Shanghai, Singapore and Sao Paulo.

The aim of this document is to provide a clear overview of Fastmarkets methodology and specifications for the PIX Packaging Europe Indices. If you have any questions, please contact Fastmarkets FOEX director Tytti Inkinen, tytti@fastmarkets.com.

Price discovery process and methodology

1.1 Methodology Rationale

Fastmarkets FOEX produces independent, fair and representative price indices for European packaging paper and board on a weekly basis. Fastmarkets FOEX's rationale is to adopt and develop the price discovery process and the methodology described in the present guide to produce indices that are a consistent and representative indicator of value of the market to which they relate for the trading period they measure, as well as for the change in prices from one week to the next.

The PIX packaging paper and board benchmark indices are calculated and confirmed by Fastmarkets FOEX based on confidential price information of actual, physical trades of packaging paper and board, collected on a weekly basis by email from companies trading in packaging paper and board. It represents the gross price agreed on contract business for packaging paper and board. The method of index calculation is fixed. The index has a large market coverage and a stable group of price providers.

The time period, or window, identified to assess a market (e.g., daily, weekly, monthly) is determined by Fastmarkets FOEX after considering the number of data points that Fastmarkets FOEX can reasonably expect to collect on a consistent basis over the selected period to support the price assessment process.

1.2 Data collection criteria

Fastmarkets FOEX staff aim to canvas a broad sample of market participants specifically involved in the buying and selling of the packaging grade of interest, with a good representation of both sides of the market. Packaging paper and board producers, traders and consumers qualify as price providers.

Price data is collected weekly from price providers, typically by email. Possibilities to use other alternative ways will be followed-up whenever deemed useful.

Reported price data will be stored at Fastmarkets FOEX for a period of seven years.

Fastmarkets FOEX has the discretionary right to decide whether to include price data received after noon on the working day preceding publication in the index calculation that week.

Price providers designate a person and a deputy for the price reporting task. Each price provider shall report their prices each week or provide a note of how long the last reported price is valid, or report "no transactions" if a provider has no eligible transactions in a given week.

Price providers agree to report their prices according to the methodology described in this document and based on all transactions meeting the specifications and to consult with Fastmarkets FOEX if they have any doubts as to the validity of a price to be reported.

Fastmarkets FOEX encourages organizations to submit all their pricing data, especially all the concluded transactions. Fastmarkets FOEX welcomes organizations to submit transaction data from authorized back office functions.

Company-specific data received from the price providers is accessible only to personnel employed by Fastmarkets FOEX. Board Members do not have access to this data.

Fastmarkets FOEX' personnel dealing with the confidential price data or other sensitive information received from the price providers for the purpose of PIX index calculations, commit not to disclose the data received, nor the source, outside Fastmarkets FOEX.

Fastmarkets FOEX commits to compile the price data, to calculate the index values and to publish the index values in accordance with the rules and specifications set forth in this document.

1.3 What price data providers submit

Data providers submit prices reflecting all eligible transactions, to the extent possible with reasonable efforts, taking into account the practical tasks in the sales administrative work to collect all required transactions. "Transaction" is defined as follows:

1. Final agreement on price for delivery of a specific quantity of recovered paper during the current month. An "eligible transaction" is a transaction that meets the specifications outlined in the Price Specifications section below.

Providers have the option to submit prices in one of three ways:

1. Average price per market (country)
2. Transaction price per supplier/customer
3. Single weighted average price: Providers submit a single price reflecting the weighted average price of all eligible transactions.

This weighted average can be calculated based on actual monthly volumes or from an annual estimate. The way each data submitter reports prices is mutually agreed with Fastmarkets FOEX before they become formal contributors to the PIX indices. The method should be consistently used to the extent possible with reasonable efforts.

Transactions with prices fixed in advance for a longer period than six months do not count as eligible transactions and shall not be reported to the index.

If the pricing structure includes a cap and floor, the price shall be reported only as long as it remains between the cap and floor. After the price has hit either of the limits, the price within the cap and floor should not be reported.

1.4 Price specifications and reference units

Fastmarkets FOEX has clear specifications for all the price points that it covers. All the reference units, such as currency and volume, are in line with recognized containerboard markets' trading conventions.

Fastmarkets FOEX 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 following industry convention. Fastmarkets FOEX staff ensure that the information they receive matches these specifications.

All Fastmarkets FOEX price specifications define the minimum lot size accepted.

1.5 Criteria to discard pricing data

Transactions are against contract-based business or other recurring business with similar pricing terms. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

The following types of transactions are typically excluded:

- Indexed-price transactions: transactions whose prices are, according to the supply contract, tied to the PIX Packaging Europe Price Index.
- Integrated sales: deliveries between affiliated parties. However, Fastmarkets FOEX reserves the right to include these if price is in line with other open-market transactions reported by data submitters and as long as they include no premium of any sort in the interests of maintaining a more robust index.

Some contracts stipulate that prices are negotiated between buyer and seller but that PIX or another index can be used to settle prices if the buyer and seller can't agree on a price. Transactions under these contracts are not considered indexed and thus shall be submitted to the index.

1.6 Providing prices of non-benchmark grade

Some buyers and sellers trade in linerboard products that do not exactly match the benchmark specifications but have a very high price correlation with the benchmark. These include grades with a different basis weight (e.g. 150 g/m² instead of 175 g/m²), or Testliner 1 instead of Testliner 2. The possibilities of reporting such data need to be discussed with Fastmarkets FOEX before joining PIX. If included, Fastmarkets FOEX would normalize the prices reported by applying the week-on-week change rather than the outright price level of the non-benchmark grade.

1.7 Data validation

Fastmarkets FOEX reviews the incoming price data in order to check its consistency with the reporting rules. If there are any doubts or questions about the price data, Fastmarkets FOEX contacts the price provider.

1.8 Weighting of Data

Weighting between price providers is achieved by assigning more price points to larger buyers/sellers than to smaller ones. The number of price points assigned to each provider is scaled by the annual volume of sales or purchases of containerboard in each index grade group (kraftliner brown, kraftliner white-top, testliners & fluting). Each price provider's weight is kept constant through the year, if no major changes occur in production capacity or purchasing/sales volumes. Volumes are checked in January to define the weighting for that year.

Fastmarkets FOEX aims to achieve an even split between buyers and sellers each week.

The weighting scales for kraftliner brown, kraftliner white-top and testliners & fluting (separate scales for sellers and buyers for Europe), based on the total annual volumes of the previous calendar year are shown in Appendix 1.

The weighting of data providers is limited so that that no single data provider or group of data providers can dominate the index. For PIX Packaging indices, the influence of any single data provider is capped at 25% in the index calculation.

1.9 Aggregation of weighted average prices

If data providers submit a single weighted average price (see Section 1.3 above), that price point is included in the week's collected price points multiple times, according to the number of price points the data provider is allowed. For instance, if a seller of kraftliner is allowed 5 price points and submits a single weighted average price of €X in a given week, then €X is included 5 times in that week's collected price points.

1.10 Calculation procedure

The highest and lowest 10 % of the number of price points are removed before calculating the average. This is done to eliminate clerical errors in the price reporting and to dampen any possible attempts to manipulate the PIX index value in one direction or the other.

1.11 Validity time of price points

If a price provider temporarily discontinues to report prices (e.g. a company may not have sales or purchases during that week/month) Fastmarkets FOEX may use the previous price received, but only for one additional month. From week to week, the monthly price(s) reported will remain unchanged in the index calculation.

1.12 Fall-back procedure

In the unlikely event that there are not enough eligible price points in a given week, and the lack of price points is threatening to distort the index development, Fastmarkets FOEX reserves the right to roll forward previous price data beyond the limits mentioned above. In such case, Fastmarkets FOEX will state that because there are an insufficient number of new price points, the previous week's index value will be republished.

1.13 Monthly average prices

The monthly average of any of the PIX indices is calculated by Fastmarkets FOEX as a straight arithmetic average from the weekly PIX index values of the month in question. The average value is published together with the last weekly index value (included in the monthly average).

1.14 Procedure to ensure consistency in the price discovery procedures

All Fastmarket FOEX price reporters are formally trained in the price discovery process and must abide by a written Code of Conduct and pricing procedures.

On a regular basis, Fastmarkets FOEX staff review markets and methodologies to ensure that assessment methodologies and the assessments they produce are appropriate for the market. Fastmarkets FOEX has also committed to conducting one external audit per year of one key index.

Methodology and specification review process

Fastmarkets FOEX continually develops and revises its methodologies in consultation with industry participants, aiming to adopt product specifications and trading terms and conditions that actually reflect and are representative of typical working practices in the industry. Material changes to the methodology and/or price specification are implemented following a consultation process which starts with Fastmarkets FOEX 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 about the proposed change.

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

Price correction policy

FOEX will not retroactively change the index value based on new information or additional submission of data received after a respective pricing session has closed.

Publication of price errors can occasionally happen for reasons that may include technical input errors or incorrect application of the methodology. To minimize the inconvenience to our subscribers, Fastmarkets FOEX aims to investigate each error as soon as it becomes aware of it and to publish a correction promptly on our website through a pricing notice with an explanation of the reason for the correction.

Fastmarkets FOEX will publish a correction of a price only where it has established undeniably that there has been an error. Fastmarkets FOEX price assessments are produced based on the best data available at the time of the assessment.

Become a contributor to the price discovery process

Fastmarkets FOEX continually seeks to increase the number of market sources willing to take part in the price discovery process. The main condition Fastmarkets FOEX requires from contributors is for them to be active participants in the market. Fastmarkets FOEX Data Submitter Policy provides guidelines defining the high level of data quality and integrity that Fastmarkets FOEX expects from contributing organization providing pricing data. Market participants that wish to provide pricing data and be part of the price discovery process should first read the Data Submitter Policy available on the Fastmarkets FOEX website.

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 FOEX pricing or have questions or comments about the methodology and price specifications, please contact Fastmarkets FOEX director Tytti Inkinen, tytti@fastmarkets.com.

Price specifications

Description: **PIX Kraftliner**

Basis weight: 170-175 g/m²

Unit: Metric ton

Quantity: Minimum 20 metric tons of prime quality in reels

Typical furnish: unbleached chemical long-fibre sulphate pulp

Location: Europe

Incoterm: Delivered at buyer's corrugated box/converting plant or warehouse.

Timing: Orders for delivery during the current month or following month at the latest

Currency: EUR. Prices reported in other currencies are converted to the index currency by Fastmarkets FOEX using the previous Friday's ECB exchange rate.

Payment terms: 10-14 days with cash discount, 30-60 days net or other term of payment which is used in the majority of the trades. Customs and other duties paid.

Price type: Gross prices before customer-specific discounts or rebates. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

Publication: Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

Technical quality criteria: standard strength characteristics

Notes: Terms and definitions according to CEPI European list of corrugated base papers. Prices reflect material that meets the CEPI standard for Brown kraftliner. Used mainly for production of corrugated boxes/board

Description: **PIX White-top Kraftliner**

Basis weight: 135-140 g/m²

Unit: Metric ton

Quantity: Minimum 20 metric tons of prime quality in reels

Typical furnish: bleached and unbleached chemical long-fibre sulphate pulp

Location: Europe

Incoterm: Delivered at buyer's corrugated box/converting plant or warehouse.

Timing: Orders for delivery during the current month or following month at the latest

Currency: EUR. Prices reported in other currencies are converted to the index currency by Fastmarkets FOEX using the previous Friday's ECB exchange rate.

Payment terms: 10-14 days with cash discount, 30-60 days net or other term of payment which is used in the majority of the trades. Customs and other duties paid.

Price type: Gross prices before customer-specific discounts or rebates. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

Publication: Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

Technical quality criteria: standard strength characteristics, brightness: ≥70% ISO (or equivalent when measured with different method)

Notes: Terms and definitions according to CEPI European list of corrugated base papers. Prices reflect material that meets the CEPI standard for White top kraftliner. Used mainly for production of corrugated boxes/board.

Description: **PIX Testliner 2**

Basis weight: 140-150 g/m²

Unit: Metric ton

Quantity: Minimum 20 metric tons of prime quality in reels

Typical furnish: old corrugated containers

Location: Europe

Incoterm: Delivered at buyer's corrugated box/converting plant or warehouse.

Timing: Orders for delivery during the current month or following month at the latest

Currency: EUR. Prices reported in other currencies are converted to the index currency by Fastmarkets FOEX using the previous Friday's ECB exchange rate.

Payment terms: 10-14 days with cash discount, 30-60 days net or other term of payment which is used in the majority of the trades. Customs and other duties paid.

Price type: Gross prices before customer-specific discounts or rebates. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

Publication: Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

Technical quality criteria: standard strength characteristics

Notes: Terms and definitions according to CEPI European list of corrugated base papers. Prices reflect material that meets the CEPI standard for Brown Testliner 2. Used mainly for production of corrugated boxes/board.

Description: **PIX Testliner 3**

Basis weight: 140-150 g/m²

Unit: Metric ton

Quantity: Minimum 20 metric tons of prime quality in reels

Typical furnish: old corrugated containers

Location: Europe

Incoterm: Delivered at buyer's corrugated box/converting plant or warehouse.

Timing: Orders for delivery during the current month or following month at the latest

Currency: EUR. Prices reported in other currencies are converted to the index currency by Fastmarkets FOEX using the previous Friday's ECB exchange rate.

Payment terms: 10-14 days with cash discount, 30-60 days net or other term of payment which is used in the majority of the trades. Customs and other duties paid.

Price type: Gross prices before customer-specific discounts or rebates. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

Publication: Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

Technical quality criteria: standard strength characteristics

Notes: Terms and definitions according to CEPI European list of corrugated base papers. Prices reflect material that meets the CEPI standard for Brown Testliner 3. Used mainly for production of corrugated boxes/board.

Description: **PIX RB-Fluting**

Basis weight: 100-105 g/m²

Unit: Metric ton

Quantity: Minimum 20 metric tons of prime quality in reels

Typical furnish: old corrugated containers

Location: Europe

Incoterm: Delivered at buyer's corrugated box/converting plant or warehouse.

Timing: Orders for delivery during the current month or following month at the latest

Currency: EUR. Prices reported in other currencies are converted to the index currency by Fastmarkets FOEX using the previous Friday's ECB exchange rate.

Payment terms: 10-14 days with cash discount, 30-60 days net or other term of payment which is used in the majority of the trades. Customs and other duties paid.

Price type: Gross prices before customer-specific discounts or rebates. Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

Publication: Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

Technical quality criteria: standard strength characteristics

Notes: Terms and definitions according to CEPI European list of corrugated base papers. Prices reflect material that meets the CEPI standard for Recycled fluting. Used mainly for production of corrugated boxes/board.

Revision History

Changes to methodology and specifications will be tracked here.

December 2019 – Data storage rule amended

Storage of price data was changed from five to seven years. The methodology guide was changed accordingly.

June 2019 – PIX Packaging Europe indices added to the methodology

Fastmarkets FOEX revamped the PIX Packaging Europe indices methodology and specifications guidelines as part of the company-wide rebranding. The weighting scale was added.

The methodologies were not changed materially during this process.

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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.

Appendix 1 – The weighting scale

PIX Packaging Europe Indices													
Weighting scale since June 2019													
Categories based on annual supply or consumption													
of Kraftliners / Testliners & RB Fluting grades													
Kraftliner	SELLERS			Price points		Kraftliner	SELLERS			Price points		Testliners & SELLERS	Price points
brown					White-top						RB Fluting		
over	1 000 000	tons	8		over	400 000	tons	8		over	3 000 000	tons	8
up to	1 000 000		7		up to	400 000		7		up to	3 000 000		6
up to	600 000		6		up to	200 000		6		up to	2 000 000		5
up to	300 000		5		up to	100 000		5		up to	1 000 000		4
up to	100 000		4		up to	50 000		4		up to	500 000		3
up to	50 000		3		up to	10 000		3		up to	100 000		2
up to	20 000		2		up to	5 000		2		up to	10 000		1
up to	10 000		1		up to	1 000		1					
Kraftliner	BUYERS			Price points		Kraftliner	BUYERS			Price points		Testliners & BUYERS	Price points
brown					White-top						RB Fluting		
over	300 000	tons	8		over	100 000	tons	8		over	500 000	tons	8
up to	300 000		7		up to	100 000		6		up to	500 000		7
up to	200 000		6		up to	50 000		5		up to	300 000		6
up to	100 000		5		up to	30 000		4		up to	100 000		5
up to	50 000		4		up to	10 000		3		up to	50 000		4
up to	10 000		3							up to	10 000		3