

Oxo-Alcohols Methodology

The alcohols (NBA, IBA, and 2-EH) have some uses just as solvents, but are primarily used as feedstocks for other products. About 50 percent of 2-EH is used to make plasticisers – chiefly Di Octyl Phthalate (DOP). Smaller amounts are used to make 2-EH acylate, 2-EH nitrate, a diesel fuel additive and lube additives. NBA is a feedstock for butyl acrylate and methacrylate, butanol-based glycol ethers, butyl acetate, and in some plasticizers. IBA is used as a solvent for nitrocellulose, in hydraulic fluids, and as a resin modifier. DOP is a plasticizer, which is material interested into a plastic (typically PVC) to enhance its flexibility and malleability. Diisononyl phthalate (DINP) is also a plasticiser with 95 percent used in European PVC.

Health risks include irritation to the eyes, skin and respiratory tracks when inhaled.

In Europe DOP has been re-labelled to a higher-risk category, featuring the skull and crossbones on packaging and machinery where it is used. DINP remains in the category below but is under investigation. Producers argue that some of DOP's poor image comes from its association with PVC. They dismiss the Swedish study which led to the re-labelling of the product as it is based on a rat's reaction to DOP, significantly different, say producers, from a human reaction.

Oxo-Alcohol feedstocks are: Butanols: Propylene, N-Butyraldehyde; Isobutanol-Propylene and Isobutyraldehyde; 2EH-N-Butyraldehyde (from Propylene); DOP-2EH and Phthalic Anhydride; DINP-Isononyl Alcohol and Phthalic Anhydride

ICIS pricing quotes oxo-alcohols in Europe, Asia-Pacific and the US.

Frequency:

Published weekly on Fridays in Asia-Pacific and the US, and on Wednesdays in Europe.

Oxo-alcohols (EUROPE)

Weekly Price Assessments:

Isobutanol Spot Prices

- FD NWE (EUR/MT & conversion to US CTS/LB)

N-Butanol Spot Prices

- FD NWE (EUR/MT & conversion to US CTS/LB)

2EH (2ethyl hexanol) Spot Prices

- FD NWE (EUR/MT & conversion to US CTS/LB)

DOP (Di Octyl Phthalate) Spot Price

- FD NWE (EUR/MT & conversion to US CTS/LB)

DINP (Diisonanyl Phthalate) Spot Price

- FD NWE (EUR/MT & conversion to US CTS/LB)

Propylene Feedstock Price

- CONTRACT FD NWE monthly (EUR/MT)

Oxo-alcohols (ASIA-PACIFIC)

Weekly Price Assessments:

N-Butanol Spot Price

- CFR NORTHEAST ASIA (USD/MT & conversion to US CTS/LB)
- CFR SOUTHEAST ASIA (USD/MT & conversion to US CTS/LB)

Isobutanol Spot Price

- CFR EAST ASIA (USD/MT & conversion to US CTS/LB)

2EH (2ethyl hexanol) Spot price

- CFR EAST ASIA (USD/MT & conversion to US CTS/LB, subject to import duty)
- CFR EAST ASIA (USD/MT & conversion to US CTS/LB, exempt from import duty)

DOP (Di Octyl Phthalate) Spot price

- CFR EAST ASIA (USD/MT & conversion to US CTS/LB)

Oxo-alcohols (CHINA)

Weekly Price Assessments:

Import Prices:

N-Butanol Spot Price

- CFR CHINA MAIN PORT (USD/MT)

Isobutanol Spot Price

- CFR CHINA MAIN PORT (USD/MT)

2EH (2ethyl hexanol) Spot price

- CFR CHINA MAIN PORT (USD/MT)

DOP (Di Octyl Phthalate) Spot price

- CFR CHINA MAIN PORT (USD/MT)

Domestic Prices:

N-Butanol Spot Price

- EAST CHINA EX-TANK (CNY/MT)
- SOUTH CHINA EX-TANK (CNY/MT)

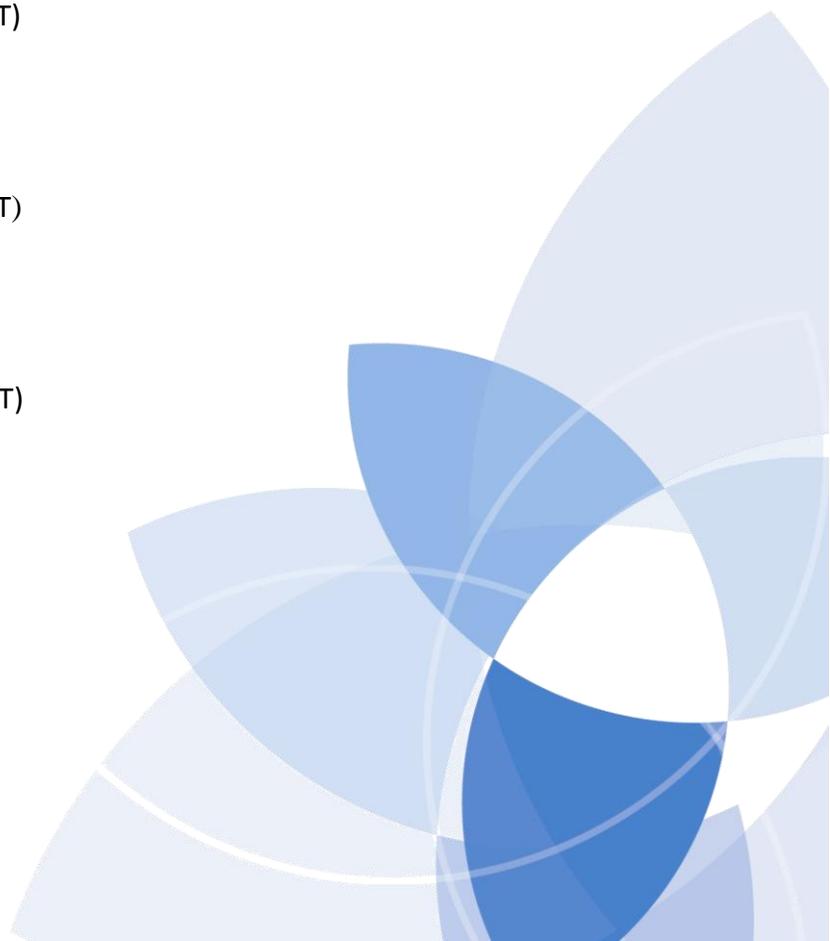
Isobutanol Spot Price

- EAST CHINA EX-TANK (CNY/MT)
- SOUTH CHINA EX-TANK (CNY/MT)

2EH (2ethyl hexanol) Spot price

- EAST CHINA EX-TANK (CNY/MT)
- NORTH CHINA EX-TANK (CNY/MT)

DOP (Di Octyl Phthalate) Spot price

- EAST CHINA EX-TANK (CNY/MT)
 - SOUTH CHINA DEL (CNY/MT)
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Oxo-alcohols (USA)

Weekly Price Assessments:

N-Butanol Domestic Prices (Delivered)

- CONTRACT monthly (US CTS/LB & conversion to USD/MT)
- SPOT (US CTS/LB & conversion to USD/MT)

Iso-Butanol Domestic Prices (Delivered)

- CONTRACT monthly (US CTS/LB & conversion to USD/MT)
- SPOT (US CTS/LB & conversion to USD/MT)

2-EH (2ethyl hexanol) Domestic Prices (Delivered)

- CONTRACT monthly (US CTS/LB & conversion to USD/MT)
- SPOT (US CTS/LB & conversion to USD/MT)

DOP (Di Octyl Phthalate) Domestic Prices (Delivered)

- CONTRACT monthly (US CTS/LB & conversion to USD/MT)
- SPOT (US CTS/LB & conversion to USD/MT)

Export Prices

- N-BUTANOL FOB (US CTS/LB & conversion to USD/MT)
- ISO-BUTANOL FOB (US CTS/LB & conversion to USD/MT)
- 2-EH FOB (US CTS/LB & conversion to USD/MT)

Propylene Feedstock Price

- C GRADE CONTRACT DEL (US CTS/LB)

General Information:

Assessment window: Price assessments are based on information supplied by market participants through the week up to close of business on Fridays at 1700 hours in Singapore, Houston and Shanghai, and on Wednesdays at 1700 hours in London.

Specification: N-butanol in Europe and Asia refers to product with a minimum purity of 99.5% and in the US, refers to product with a minimum purity of 99%. Iso-butanol is quoted in Europe with a minimum purity of 99.5% and a maximum water content



of 0.05%. 2EH in Europe refers to product with a minimum purity of 99.5%, a maximum water content of 0.1% and a maximum acidity of 0.01%. In the US, 2EH refers to product with a minimum purity of 99% and in Asia refers to product with a minimum purity of 98%, but in particular, 2EH in China refers to product with a minimum purity of 99.5%.

Timing: Cargoes loading or delivered four weeks forward from the date of publication.

In the Oxo-Alcohols (China) report, imported cargoes are assessed for loading or delivery four weeks forward from the date of publication, and domestic cargoes are assessed for loading within 3 days after full payment from the buyers.

Terms: Typically 30-60 days after bill of lading date. In Asia, the price range is based on credit terms of LC 90 days. Confirmed deals with differing credit terms will be factored into the assessment but will be adjusted to LC 90 days equivalent.

In the Oxo-Alcohols (Asia-Pacific) report, spot price assessments for 2EH are split between cargoes which are subject to and exempted from import duties in East Asia. The free trade agreement (FTA) drawn up in early 2009 between China and ASEAN (Association of South East Asian Nations) has exempted oxo-alcohols exports from ASEAN countries to China from the 5.5% tariff, which imports from other countries such as Japan and South Korea are subject to. The CFR E Asia quote (subject to duty) is represented by South Korean and Japanese exports to China. The quote also includes trade within the region i.e. from South Korea to Taiwan. Exports from China, after considering rough freight costs, are also included in the CFR E Asia assessment. ASEAN exports to China are reflected in the CFR E Asia (duty exempt) quote. In addition, trade within the ASEAN region, is free of import duty, in accordance with the ASEAN FTA (AFTA).

In the Oxo-Alcohols (China) report, domestic prices refers to deals in which the buyers accomplish the full payment ahead of or on the cargoes loading.

In the European report, the prices quoted are spot prices. To reflect this particular market, this term incorporates single spot deals as well as freely negotiated monthly business. It does not include any transaction between a buyer and seller in which the buyer is required to take a set volume from a seller.

Standard cargo size: For Asia, cargoes assessed are typically 1,000 tonnes. In the Oxo-Alcohols (China) report, domestic 2EH cargoes assessed are 50-200 tonnes, and domestic N-butanol or Iso-butanol cargoes assessed are 20-100 tonnes. In the US, prices reflect small-to-medium domestic contracts (1-3 million lbs/yr) on each contracted range per alcohol type. In Europe, assessments represent trucks with cargoes of 25-200 tonnes.



Assessment basis: Price assessments are based on information gathered throughout the week from market participants including producers, consumers, traders and distributors. In the event of a lack of trades, the published price range represents the highest bids received and the lowest sell indications for the week.

All regional reports offer market commentary that where appropriate includes details of traced transactions, news on the supply/demand balance, export/import information and other factors impacting the market with more emphasis placed on price movements occurring in the latter part of the week.

The European market is balanced with limited availability for export.

Although China is the key net importer for oxo-alcohols in Asia, information in the Asia report also covers southeast Asia, Taiwan and Korea

Export pricing information in the US report represents price ideas for spot business to Latin America.

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