

Limits and Banding

This topic describes price limits and banding. Price limits and banding ensure pricing integrity for all products traded on the platform.

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Price Limits

The maximum price range permitted a contract during one trading session. Trading limits are set by the exchange for certain contracts. Price limits should not be considered to be an effective tool to ensure convergence and, in fact, they could actually inhibit convergence if they remain in place during the expiration period of a contract. While CME Group specifies daily price limits for many of its futures contracts that are based on physical commodities (e.g., corn, wheat and soybeans), these limits are removed during the delivery month to ensure that futures settlement prices accurately reflect the value of the underlying commodity at the delivery location.

The Daily Limit Adjustment (DLA) program calculates and applies new high and low price limits during a trading session.

- [AG DLA](#)
Instruments in certain product groups, for example, Agriculture (AG), are required to have high/low limits removed within a certain time period prior to expiration.

GTC or GTD Submitted Outside Daily Limits

Products that have daily limits, based on prior session settlement, cannot trade outside of those daily limits. However, a GTC or GTD order may be entered in most products (Big Equities being the exception) on CME Globex outside of the daily limit. Once accepted, the GTC/GTD will not be actionable until the price comes within the daily (hard) limits of a trading session.

Example: [GTD](#) or [GTC](#)

1. A GTD or GTC order to buy 10 ZCZ1 @ 5600 is entered.
 - The current daily price limits are 5612 minimum and 6212 maximum.
 - The GTD or GTC order is placed on the book.
2. The market closes and reopens on the next day with price limits of 5412 for the minimum and 6012 for the maximum. The order is now inside the daily range.
3. A sell order comes into the book to sell 10 ZCZ1 @ 5600 which matches against the buy order at 5600. (For purposes of this example, we assume that at time of entry, this incoming order is within current price bands.)

Price Banding

To ensure market integrity, CME Globex has a price banding mechanism which subjects all orders to price validation and rejects orders outside the given band. This mechanism prevents antagonistic or erroneous orders, such as limit bids at prices well above the market or limit offers at prices well below the market, from transacting market-moving trades that require subsequent cancellations.

CME Globex uses one mechanism for futures price banding and another mechanism for options price banding. Price banding is applied to each CME Globex product individually. A complete list of banding information for each electronically traded product is available at: [GCC Price Banding](#).

Price banding scans price-based orders, rejecting any buy orders above the "CME Last Price" PLUS a fixed band value or, any sell orders below the CME Last Price MINUS a fixed band value. The Last Price is determined by the last transaction, or the best bid or best offer through the last transaction. Alternatively, the Last Price can be determined by the Settlement Price, if no other prices are available.



In implied markets, the Last Price can be determined by the implied better bid or implied better offer.

Banding does not prevent traders from entering bids below the market or entering offers above the market. It does not restrict how far below or above the market a trader may wish to trade. Banding does not hinder the market's depth in any way. Price Banding only prevents a trader from bidding or offering at prices that appear to be unrealistic and potentially damaging to the marketplace.

Price Banding will not "lock-up" the market in the event of a rapid decline or advance in prices. The price band is based on the last traded price or the best bid or offer. As such, the band is moved by the action of entering bids or offers beyond the most recent last traded price or the best bid or offer.

Although banding does not prevent order entry, for products with price limits or circuit breakers, order entry may be prevented by the price limits or circuit breakers which take precedence over price banding.

Price Banding with Market Limit Orders

Banding does not affect market orders so the price banding logic will not prevent the entry of market orders. A market order only has the potential to match the market price to the best bid or offer in the book but not beyond.

To illustrate this point, consider the entry of a 100-lot market limit order to buy when the book is configured as shown below:

Bid Quantity	Price	Offer Quantity
	150.75	300
	150.50	100
	150.25	50
	150.00	25
35	149.75	
60	149.25	
75	149.00	
25	148.75	

The immediate effect of the 100-lot market order to buy is that the order will be filled for 25 instruments at a price of 150.00. The unfilled 75 buy orders are processed by CME Globex as a 75-lot limit bid at 150.00. As such, a market buy or sell order does not push the book past the current best bid or offer, respectively.

Banding will protect for the conversion of market orders into limit orders outside of the host at prices that would run through the book. An order under those conditions would be rejected.

Price Banding with Stop Orders

Stop orders are processed relative to the price banding parameters. If the buy (sell) price is farther from the trigger price than the banding parameter then the order is rejected. Therefore, for all accepted Stop orders, if the stop price is hit, the limit order will be at a price within the band.

Price Band Variation

Based on the market state and trading activity, a Price Band Variation (PBV) will be applied above and below the instrument's reported reference price to establish the Price Band Variation Range (PBVR). The PBV is a static value that varies by product. It is symmetrically applied at both the upside (for bids) and downside (for offers) levels with each price change and enforced during the trading session.

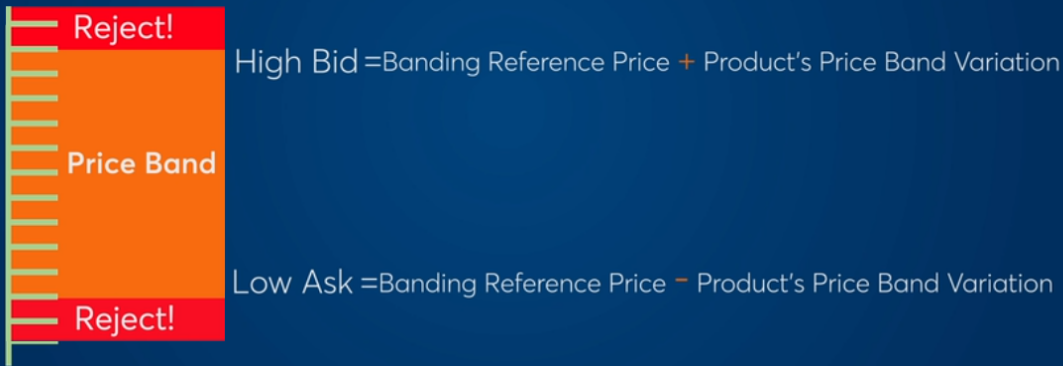
If market conditions dictate a wider price band, for example, in a volatile market where prices are fluctuating rapidly, CME Group may elect to temporarily relax or suspend the price banding restriction. In addition to the PBVR, Daily Trading Limits may be in effect for certain products. Daily Trading Limits are always given priority over PBVR in rejecting orders with erroneous prices. PBVR are monitored throughout the day by the [CME Global Command Center \(GCC\)](#) and may be adjusted if necessary.

It is important to note that the Daily Trading Limits always take precedence over PBVR in rejecting orders with erroneous prices. Price bands are monitored throughout the day by the [CME Global Command Center \(GCC\)](#) and are adjusted when necessary.

Futures Banding

With each price change the PBVR is recalculated and the new range is applied. The CME Globex platform rejects all bids and offers outside the PBVR. Applying the PBV to a reference price determines the PBVR.

An order submitted with a price outside of its corresponding Price Band is rejected.



The reference price used depends on the market state and trading activity:

- The instrument's Settlement Price will serve as the PBVR reference price during the Pre-Open and the Pre-Open/No-Cancel period, until the Indicative Opening Price is calculated.
- Once an **Indicative Opening Price (IOP)** is established, the Indicative Opening Price becomes the PBVR reference price.
- During the continuous trading, the CME Globex Last Price serves as the reference price for the PBVR.
- If a instrument has transitioned to continuous trading with no Indicative Opening Price or CME Globex Last Price being established, then the Settlement Price will continue to serve as the PBVR reference price until a CME Globex Last Price is established.
- In the event of a market emergency where a market is placed in a non-trading mode after continuous trading has begun, then the Indicative Opening Price will serve as the PBVR reference price during the non-regular Pre-Open and the Pre-Open/ No-Cancel Period. If no Indicative Opening Price is available, then the CME Globex Last Price will serve as the PBVR reference price.

The PBVR adjusts dynamically as the CME Globex Last Price changes for a given product.

Feature File

Expand the box below to view a Price Banding logical scenario.

BandingMultiplier.feature

Feature: Price Banding during PCP Pre-Open

Background:

Given the following:

* Instrument Group Configurations:

groupName	clearingFormat
6B	M1

* Contracts:

symbol
6BM2

* the following attributes are updated for contract(s) in real time:

securityDescription	settlementPrice	futureBandValue	bandSwitch
6BM2	2000.00	975	true

Scenario: future outside bands during pre-open when pre-open multiplier is set at group level with bandingMultiplier equals to 2

When the following events occur:

* these "new order" message(s) are sent to Globex:

securityDescription	price	side	orderQty	timeInForce
6BM2	2000.0	bid	1	session
6BM2	2000.0	ask	1	session

* the group(s) "6B" is put in "preOpen" with reset statistics "off"

* "bandingMultiplier" of group "6B" is changed to "2"

* these "new order" message(s) are sent to the Globex:

securityDescription	price	side	orderQty	timeInForce
6BM2	2000.0	bid	20	session
6BM2	2000.0	ask	20	session
6BM2	2025.0	bid	20	session

6BM2	3975.0	bid	1	session
6BM2	49.0	ask	1	session

Then the following should happen:

```
* expect execution message(s) with values:
| messageType | securityDescription | price | side | orderQty |
| order ack   | 6BM2               | 2000.0 | bid  | 1         |
| order ack   | 6BM2               | 2000.0 | ask  | 1         |
| order ack   | 6BM2               | 2000.0 | bid  | 20        |
| order ack   | 6BM2               | 2000.0 | ask  | 20        |
| order ack   | 6BM2               | 2025.0 | bid  | 20        |
# expect rejects due to price outside of high and low bands
| order reject | 6BM2               | 3975.0 | bid  | 1         |
| order reject | 6BM2               | 49.0   | ask  | 1         |
```

Scenario: future outside bands during PCP when reserve multiplier is set at group level with bandingMultiplier equals to 2

When the following events occur:

```
* these "new order" message(s) are sent to Globex:
| securityDescription | price | side | orderQty | timeInForce |
| 6BM2               | 2000.0 | bid  | 1         | session      |
| 6BM2               | 2000.0 | ask  | 1         | session      |
* the instrument(s) "6BM2" is put in "reserve"
* "bandingMultiplierForReservedState" of group "6B" is changed to "2"
* these "new order" message(s) are sent to the Globex:
| securityDescription | price | side | orderQty | timeInForce |
| 6BM2               | 2000.0 | bid  | 20        | session      |
| 6BM2               | 2000.0 | ask  | 20        | session      |
| 6BM2               | 2025.0 | bid  | 20        | session      |
| 6BM2               | 3975.0 | bid  | 1         | session      |
| 6BM2               | 49.0   | ask  | 1         | session      |
```

Then the following should happen:

```
* expect execution message(s) with values:
| messageType | securityDescription | price | side | orderQty |
| order ack   | 6BM2               | 2000.0 | bid  | 1         |
| order ack   | 6BM2               | 2000.0 | ask  | 1         |
| order ack   | 6BM2               | 2000.0 | bid  | 20        |
| order ack   | 6BM2               | 2000.0 | ask  | 20        |
| order ack   | 6BM2               | 2025.0 | bid  | 20        |
# expect rejects due to price outside of high and low bands
| order reject | 6BM2               | 3975.0 | bid  | 1         |
| order reject | 6BM2               | 49.0   | ask  | 1         |
```

Scenario: future outside bands during pre-open when pre-open multiplier is set at group level with bandingMultiplier equals to 3

When the following events occur:

```
* these "new order" message(s) are sent to Globex:
| securityDescription | price | side | orderQty | timeInForce |
| 6BM2               | 2000.0 | bid  | 1         | session      |
| 6BM2               | 2000.0 | ask  | 1         | session      |
* the group(s) "6B" is put in "preOpen" with reset statistics "off"
* "bandingMultiplier" of group "6B" is changed to "3"
* these "new order" message(s) are sent to the Globex:
| securityDescription | price | side | orderQty | timeInForce |
| 6BM2               | 2000.0 | bid  | 20        | session      |
| 6BM2               | 2000.0 | ask  | 20        | session      |
| 6BM2               | 2025.0 | bid  | 20        | session      |
| 6BM2               | 3975.0 | bid  | 1         | session      |
| 6BM2               | 49.0   | ask  | 1         | session      |
```

Then the following should happen:

```
* expect execution message(s) with values:
| messageType | securityDescription | price | side | orderQty |
| order ack   | 6BM2               | 2000.0 | bid  | 1         |
| order ack   | 6BM2               | 2000.0 | ask  | 1         |
| order ack   | 6BM2               | 2000.0 | bid  | 20        |
| order ack   | 6BM2               | 2000.0 | ask  | 20        |
| order ack   | 6BM2               | 2025.0 | bid  | 20        |
| order ack   | 6BM2               | 3975.0 | bid  | 1         |
| order ack   | 6BM2               | 49.0   | ask  | 1         |
```

Scenario: future outside bands during PCP when reserve multiplier is set at group level with bandingMultiplier equals to 4

When the following events occur:

* these "new order" message(s) are sent to the Globex:

securityDescription	price	side	orderQty	timeInForce
6BM2	2000.0	bid	1	session
6BM2	2000.0	ask	1	session

* the instrument(s) "6BM2" is put in "reserve"

* "bandingMultiplierForReservedState" of group "6B" is changed to "4"

* these "new order" message(s) are sent to the Globex:

securityDescription	price	side	orderQty	timeInForce
6BM2	2000.0	bid	20	session
6BM2	2000.0	ask	20	session
6BM2	2025.0	bid	20	session
6BM2	3975.0	bid	1	session
6BM2	49.0	ask	1	session
6BM2	5902.0	bid	1	session

Then the following should happen:

* expect execution message(s) with values:

messageType	securityDescription	price	side	orderQty
order ack	6BM2	2000.0	bid	1
order ack	6BM2	2000.0	ask	1
order ack	6BM2	2000.0	bid	20
order ack	6BM2	2000.0	ask	20
order ack	6BM2	2025.0	bid	20
order ack	6BM2	3975.0	bid	1
order ack	6BM2	49.0	ask	1
# expect rejects due to price outside of bands				
order reject	6BM2	5902.0	bid	1

Video

Click the icon below to view a video for Futures Price Banding:



Options Banding

Price Banding for options is enforced in consideration of the following:

Although a series of options on a futures instrument may trade frequently, any single specific strike price option may not trade or be quoted regularly. The price of the underlying futures instrument may change substantially relative to the option's CME Last Price, causing the market value of a formerly out-of-the-money option to increase significantly while the PBVR is locked in place.

Options with different strikes require different price bandwidths. PBVRs for "out-of-the-money" options should be narrower than those for "in-the-money" options to reflect the differences in the extent to which bids and offers departing from their fair market value may be considered erroneous.

For these reasons, CME Group has instituted enhanced options price banding, a dynamic price banding system, for selected options and options spreads traded on the CME Globex platform.

Enhanced Options price banding is identical to futures price banding, with the following modifications:

For Outright Options - based on market conditions, the reference price is set to either the:

- Last Price of the option
- Theoretical Options Price based on well-established options pricing algorithms
- Last Price in combination with the Theoretical Options Price, if practical.

For Options Spreads (UDS) – the reference price is a theoretical value derived from the reference prices of the legs within the UDS. A change to the legs' reference prices will result in an updated reference price of the UDS. The Last Price or Bid/Offer of the UDS will not update the reference price. If a customer experiences issues entering orders due to price banding, contact the CME Global Command Center (GCC) to adjust price bands.

The width of the price bands is determined by the following:

- A Fixed PBV for the entire option series which is identical to the price banding for futures
- A Dynamic PBV based on the delta of the option, as estimated by the Theoretical Options Price calculation
- A Dynamic PBV based on a percentage of the Theoretical Options Price, where the percentage is based on the delta of the option