**Futures Settlement Price Discovery Algorithm**

Settlement futures prices are defined in accordance with the internal documents of PJSC Moscow Exchange and JSC NCC.

Parameters used to define Settlement prices are as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter name** | **Time of collection of Market data for the day clearing session** **(MDtimeIcl)** | **Time of collection of Market data for the evening clearing session** **(MDtimeEcl)** | **Frequency of Market data collections****(freq)** | **Number of market data collections****(count)** | **Parameter for establishing priority of market data** **(spread)** |
| **Value** | 3 minutes  | 8 minutes | 5 seconds | 12 | 0.2 |

 13:57-13:58 18:37-18:38

**Day trading session starts**

**Intermediate clearing starts**

**Evening clearing starts**

 10:00 14:00 18:45

**Market data collecting**

**Market data collecting**

For active futures (market data priority = 1):

Starting from the moment ***MDtime*** before the clearing session every ***freq*** seconds ***count*** number of times on all instruments best bids ***bid***, asks ***ask*** and last prices ***last*** are collected.

Filtered values ***bid***, ***ask*** and ***last*** are calculated as a median of the downloaded data. Settlement price is equal to the median of the filtered values ***bid***, ***ask*** and ***last.***

Sample 1: Median of the downloaded data is used as Settlement price

|  |
| --- |
| Market Data |
| **Bid** | **Last** | **Ask** |
| 118110 | 118130 | 118250 |
| 118530 | 118600 | 118760 |
| 118560 | 118570 | 118570 |
| 118590 | 118590 | 118620 |
| 118230 | 118320 | 118400 |
| 118220 | 118440 | 118380 |
| 118640 | 118560 | 118890 |
| 118670 | 118680 | 118700 |
| 118700 | 118800 | 118750 |
| 118340 | 118920 | 118530 |
| Filtered Data |
| 118545 | 118580 | 118595 |
| Settlement Price |  |
| 118580 |  |  |

Sample 2: Settlement price is based on the bid price as bids improve last price.

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| Market Data |
| **Bid** | **Last** | **Ask** |
| 118110 | 118130 | 118250 |
| 118530 | 118130 | 118760 |
| 118560 | 118130 | 118570 |
| 118590 | 118130 | 118620 |
| 118230 | 118130 | 118400 |
| 118220 | 118130 | 118380 |
| 118640 | 118130 | 118890 |
| 118670 | 118130 | 118700 |
| 118700 | 118130 | 118750 |
| 118340 | 118130 | 118530 |
| Filtered Data |
| 118545 | 118130 | 118595 |
| Settlement Price |  |
| 118545 |  |  |

For non-active futures (market data priority = 2):

If another futures contract with this underlying asset contains first priority market data, the settlement price of the non-active futures is based on the active futures price and the uploaded interest rate curve.

Market data is considered to be of second priority if any of the filtered values ***bid***, ***ask*** or ***last*** are missing,or if the bid/ask spread is bigger than **spread\*MR1** % of the quote, where MR1 is the minimum restrictive level of the initial margin rate Level 1 for the underlying asset.

Example:

If futures Num = 2 is non-active, its Settlement price is discovered in the following way:

SP (2) = SP (spot)\* (1 + r \* T), where SP (spot) is the spot settlement price, T – time to futures expiration, r – interest rate for the underlying asset for period T.

Spot settlement price is based on the market data if the asset is traded in the EQ or FX market and defined as per the futures algorithm (can be first or second priority). It can also be defined by haircutting the futures SP with first priority for the current date.