SIX Swiss Exchange
Order Book Trading Guide

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Table of Contents

1. Introduction

1.1 Order Book Matching on the SWXess Trading Platform

The Exchange System is the central component of the SWXess Trading Platform.

- Prior to the complete migration of all instruments onto the new platform it was also referred to as the **Quote System (QS)**or the "Quotematch" Platform, and is the high-transaction matching engine, used for all markets.

    Quotes and Orders can be entered on the Exchange System via two interfaces:

    1. The Standard Trading Interface (STI) is used for entering Orders (also referred to as STI Orders).

    2. The Capacity Trading Interface (CTI) is used for entering Orders (also referred to as CTI Orders or Volatile Orders) and Quotes (also referred to as CTI Quotes). Entry of CTI Orders is limited to equity segments. Entry of CTI Quotes is reserved for Market Makers.
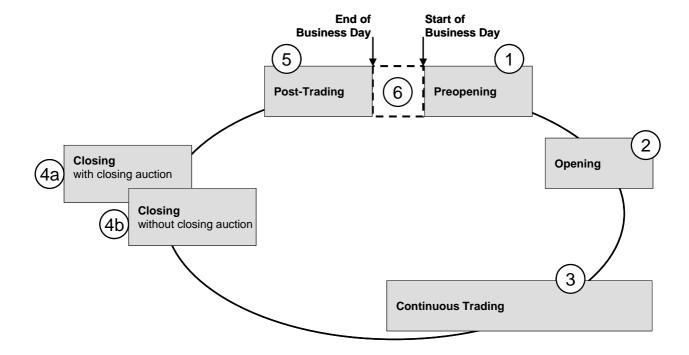
1.2 Market Models

The Exchange System supports various market models. An overview of market models, related product segments and characteristics is given in the following table:

Market Models	Product Segment traded	Market Model characteristics
Central Limit Order Book (CLOB)	- Swiss Equities - International Equities - CHF Bonds - Investment Funds	All Market Models have the same trading periods (see 1.3) and general matching principles (see 1.4). The particularities of the CLOB are: - Stop Trading (Avalanche Stop) based on reference price - Close of Trading (with closing auction or without closing auction) More details in Chapter 2.
Market Maker Book (MMB)	- International Bonds - Exchange Traded Funds (ETF) - Exchange Traded Structured Funds (ETSF) Warrants and Structured Products (Scoach Schweiz AG)	All Market Models have the same trading periods (see 1.3) and general matching principles (see 1.4). The particularities of the MMB are: - Quote based price determination - Stop Trading, when no quote (as benchmark) in the book - Close of Trading (no closing auction, but publication of the closing inside market) More details in Chapter 3.
Market Maker Book – Fill or Kill (MMB-FoK)	International Bonds (with Minimum Denomination>smallest tradable unit)	All Market Models have the same trading periods (see 1.3) and general matching principles (see 1.4). The particularities of the MMB-FoK are: - Orders must be fully executed with each execution at or above the minimum denomination or will be rejected (i.e. Orders are not maintained in the order book). - Close of Trading (no closing auction, but publication of the closing inside market) More details in Chapter 4.

1.3 Trading Periods

A trading day is subdivided into five business periods: Preopening, Opening, Continuous Trading, Close of Trading and Post-Trading, plus the technical End of Day period.

Order/Quote maintenance for each Trading Period:

Extraordinary situations:
(possible in all business periods)

Trading Periods / Transactions		Preopening	Opening	Continuous Trading	Close of Trading	Post-Trading	Suspension	Break
STI Order	Entry	yes[1]	yes	yes	yes[2]	yes[1]	yes[1]	yes[1]
	Deletion	yes	yes	yes	yes	yes	yes	yes
	Automatic Deletion	no	no	no	no	yes[3]	no	no
	Mass Withdraw	yes	yes	yes	yes	yes[3]	yes	yes
CTI Order (Volatile Order)	Entry	yes[1]	yes	yes	yes	no	yes	yes
	Deletion	yes	yes	yes	yes	no	yes	yes
	Automatic Deletion	no	no	no	no	yes[3]	no	no
	Mass Withdraw[4]	yes[4]	yes	yes[4]	yes[4]	yes[4]	yes[4]	yes[4]
CTI Quote	Entry	yes	yes	yes	yes[2]	yes	yes[1]	yes[1]
	Deletion	yes	yes	yes	yes	yes	yes	yes
	Automatic Deletion	no	no	no	no	yes[3]	no	no
	Mass Quote-Update / Withdraw [5]	yes[5]	yes[5]	yes[5]	yes[5]	yes[5]	yes[5]	yes[5]
Executions		no	yes (Auction)	yes	yes[2] (Auction)	no	no	no

[1] Orders will be rejected for securities traded in MMB-FoK. It is also not possible to enter Fill or Kill Orders and Accept Orders.

[2] Order/Quote entry and executions possible for close of trading with closing auction

[3] All Orders with end of day expiry will be automatically deleted after Close of Trading. The same applies to Volatile Orders, which can solely be placed for same-day execution. Quotes will be automatically deleted at the end of Post-Trading.

[4] The Mass Withdraw function is optionally available for Volatile Orders.

[5] The Mass Quote Update function is exclusively available in the securitized derivative market of Scoach Schweiz AG.

①

1.3.1 Preopening

During the **Preopening** period, Orders (Exception: MMB-FoK) and Quotes can be entered or deleted, but no actual trades are generated as no matching occurs. The Orders and Quotes in the book are "theoretically" matched (i.e. no updates to the book are performed) in order to determine the TOP (i.e. the Opening price that would result if the book were to open at that point).

Preopening can have the **Non Opening, Delay Open or Openable** as the "next" order book state, based on the result of the calculation of the theoretical Opening price (TOP). Only when the order book is Openable the trading period can change to Opening.

1.3.1.1 Non Opening

Theoretical Opening Price (TOP) cannot be evaluated (in CLOB and MMB).

If one or more market orders cannot be matched, then a TOP cannot be determined and a Non Opening condition exists.

In this case the **next order book state is "Non Opening".**

NB: In the Market Maker Book "Fill or Kill" Market Model, there is no Non Opening, since (Market) Orders are not entered in the order book.

1.3.1.2 Delay Open

CLOB specific:

TOP is outside the expected range:

If the calculated TOP differs from the reference price (see 1.3.4) by more than or equal to an exchange defined range (Stop Trading Range), a Delay Open condition exists. The Stop Trading Range is a percentage range. A Delay Open condition delays the Opening for a period of time defined by the exchange (Stop Trading Duration). The Stop Trading condition can also be cancelled by Market Operations.

In this case the **next order book state is "Delay Open".**

MMB specific:

Matching situation with no quote in the book

If Orders can match but there is no Quote in the book, then the Delay Open condition is set. A Delay Open condition delays the Opening for a period of time defined by the exchange (Stop Trading Duration) or until a Quote is entered. The Stop Trading condition can also be cancelled by Market Operations.

In this case the **next order book state is "Delay Open".**

MMB-FoK specific:

Orders are never entered in the MMB-FoK book. The book may contain only Quotes, thus it is always "openable". In this period, all incoming Orders and Quotes with a volume smaller than the smallest tradable unit are rejected.

1.3.2 Opening

The **Opening** period determines the Opening price and executes the Orders according to the matching rules. In order to establish the Opening price at the start of trading (or upon resumption of trading after an interruption), the principle of highest volume transacted is used. This means that the price is fixed so that the largest possible turnover is achieved.

The Orders and Quotes in the book are matched to produce trades at the last calculated TOP (which becomes the Opening price), determined during the theoretical matching in Preopening. The book is updated during matching.

MMB-FoK specific:

Trades in the Opening can only result from Quotes matching Quotes.

1.3.3 Continuous Trading ③

During the **Continuous Trading** period, new Orders or Quotes are continuously matched with Orders or Quotes already in the book according to the matching rules. All Orders remain in the book until they match or expire (Exception: MMB-FoK). During Continuous Trading, trading in some securities can be briefly interrupted by a so-called 'Stop Trading' in case of extreme price fluctuations or in the absence of a Quote in a matching situation.

Common to CLOB & MMB:

The incoming Order or Quote is matched against the Orders and Quotes already in the book to produce trades. The trade price is determined each time a trade is produced (from matched orders/quotes), and so one incoming Order or Quote can potentially result in several trades at different prices. The book is updated during matching.

CLOB specific:

- Price determination:

  Incoming Orders / Quotes match at the price of existing limit orders.

- Stop Trading:

  If the matching price differs from the reference price by more than or equal to an exchange defined range (Stop Trading Range), a Stop Trading condition exists. This Stop Trading functionality also takes into account the price fluctuation over a predefined period of time (as a general rule, 10 seconds). The Stop Trading condition can be terminated before the time elapses by Market Operations.

MMB specific:

- Price determination:

  Incoming Quotes match at the Quote price or at the best remaining limit in case of surplus on the order side (Quote-based price determination).

- Stop Trading:

  If an incoming Order can match but there is no Quote on the opposite side in the book, then a Stop Trading condition exists. The Stop Trading condition can be terminated before the time elapses, if a Quote is entered in the book, or by Market Operations.

MMB-FoK specific:

All incoming Orders must be either fully matched, with each partial execution at or above the minimum denomination, or are rejected. Orders are not entered in the book.

Remaining Quotes with sizes below the minimum denomination are automatically deleted.

1.3.4 Close of Trading (4)

After Continuous Trading the Exchange System changes into the **Close of Trading.** Three different kinds of the period Close of Trading are used (see table below). In the case of the closing auction (4a) the Exchange System functions in the same manner as it does at the Opening of trading: orders on the book are executed in keeping with the principle of highest volume transacted. However, upon determination of the last-paid price, the status of the order book immediately changes over to Post-Trading status for the next trading day. Any Orders remaining on the order book with today's date are automatically deleted in this change over.

Type of closing

	Rule	Market Model	Products
4a	Close of Trading **with closing auction**	CLOB	• Equities • Funds
4b	Close of Trading **without closing auction**	CLOB	• CHF-Bonds
		MMB / MMB-FoK	• International Bonds • ETF • ETSF • Scoach Schweiz AG - Derivates

Prices at the Close of Trading

	Rule	Closing Price	Reference price after Close of Trading
4a	Closing auction **with price determination**	Auction price	Auction price
4a	Closing auction **without price determination**	Last paid price of trading day	Last paid price of trading day
4b	Close of Trading **without closing auction**	Last paid price of trading day	Last paid price of trading day
4a/ 4b	**No paid price** during trading day	Last closing price	Automatic reference price adjustment*

* The reference price is adjusted daily based on the following rules and conditions:

- On Close of Trading limit orders must be in the order book.
- If the Buy-side Closing Inside Market price is higher than the reference price, the Buy-side Closing Inside Market price is taken as the new reference price.
- If the Sell-side Closing Inside Market price is lower than the reference price, the Sell-side Closing Inside Market price is taken as the new reference price,
- Provided the security has not transferred to Continuous Trading during the trading day (e.g. in the case of a suspension or a Non Opening), the reference price is not adjusted.

In all other cases, the reference price remains unchanged.

1.3.5 Post-Trading ⑤

The Post-Trading period acts largely in the same way as the Preopening period. Orders (Exception: Orders in MMB-FoK; Volatile Orders in Preopening only) and Quotes can be entered or deleted, but no actual trades are generated as no matching occurs. All incoming Orders must have an expiry date in the future.

1.3.6 End of Day ⑥

This "End of Day-Status" is a technical phase. Orders and Quotes cannot be entered.

1.3.7 Extraordinary situations

The normal trading periods can be interrupted by the following extraordinary situations:

- Suspension:

    Trading may be temporarily suspended in individual issues or entire market segments. For the securities involved, no Opening or Continuous Trading will take place. If a security is suspended, all Orders/Quotes remain and can be entered/deleted during suspension (like e.g. in Preopening).

- Break:

    If a technical problem or other emergency situations occur at any point during the day, then the current period is interrupted by a Break phase. A Break starts with a **closing** transition followed by the actual Break phase. During the break, Orders and Quotes can be entered and deleted, but no Order or Quote matching takes place. The Break ends with an **opening** transition.

1.4 Matching Rules & Principles

1.4.1 Matching Rules

The matching rules depend on:

- The market model (CLOB, MMB or MMB-FoK)

- The trading period (e.g. Preopening, Continuous Trading, Close of Trading) in combination with the order book state (e.g. Normal, Non Opening, Delay Open, Stop Trading, Delay Open with Non Opening, Stop trading with Non Opening) as well as the security state (e.g. active, underlying condition, suspended).

Two kinds of matching rules are used:

- **Auction matching rules:**

    The matching rules are used for all situations, other than Continuous Trading:

    e.g. in Preopening, Break or Close of Trading and for Non Opening, Delay Open, Stop Trading, Delay Open with Non Opening, Stop Trading with Non Opening

- **Continuous Trading matching rules:**

  The matching rules used for an active security in Continuous Trading in a normal order book state.

	CLOB	MMB	MMB-FoK
Auction matching rules	See section 2.1	See section 3.1	See section 4.1
Continuous Trading matching rules	See section 2.2	See section 3.2	See section 4.2

1.4.2 Matching Principles

Price-Time Priority:

Before matching, orders (not in MMB-FoK) and quotes on each side of the book are ordered in price-time priority, regardless of which type of matching is being executed.

Best price to worst price (price priority):

- buy: market orders followed by limit orders and/or quotes (highest limit to lowest limit)

- sell: market orders followed by limit orders and/or quotes (lowest limit to highest limit)

then, orders and/or quotes within price, oldest to youngest (time priority).

In Auctions the "Principle of highest volume transacted" is used:

According to the principle of highest volume transacted, exchange prices must be determined such that the highest possible volume of shares will change hands.

After orders and/or quotes have been entered into the order book and matched, the exchange system determines the price that will maximize share turnover.

2. Matching Rules – Central Limit Order Book (CLOB)

Quotes in the CLOB model are treated as limit orders, i.e. the same matching rules apply whether a limit price in the order book results from the entry of a limit order or of a quote.

2.1 CLOB Auction Matching Rules

2.1.1 Principles

The matching rules are used to determine a TOP.

The orders and quotes in the book are "theoretically" matched (i.e. no matching updates to the book are performed, and no trades are produced) in order to determine the TOP (i.e. the opening price that would result if the book were to open at that point).

In the Opening,

- the Opening Trade Price is the last calculated TOP during Preopening.
- the trade price for all trades created during Opening is the Opening Trade Price.
- opening is only performed if the book is in an "openable" condition, as determined during Preopening.

Calculation of the TOP:

Orders/quotes are taken from one side of the book (in price-time sequence) and matched against the orders/quotes from the opposite side of the book (in price-time sequence).

This is only possible while the bid price (of the buy order/quote being considered) is greater than or equal to the ask price (of the sell order/quote being considered).

Matching continues until one of the following two conditions prevail:

- No more orders/quotes are left on one side of the book.
- No more orders/quotes can be matched (bid price is less than the ask price).

The last pair of orders/quotes matched forms the basis for the determination of the TOP, together with the best remaining limit order/quote in the book, and the reference price.

The TOP must be better than or equal to the limit of the best orders/quotes (buy and sell) remaining in the book.

If no TOP can be calculated the TOP is "NULL".

Conditions to be able to calculate a TOP:

- The TOP must lie on a valid price step.
- All market orders must be matched in order to be able to determine a TOP, and so to prevent a Non Opening condition.
- If a security is assigned to a Stop Trading Category which supports Delay Open, then the Delay Open condition must be considered. A Delay Open condition occurs if the TOP differs from the Reference

Price by more than or equal to the exchange defined range (Stop Trading Range). The Stop Trading Range is expressed as a percentage. If a Delay Open condition exists at the time of the Opening, then the Opening is delayed for a period of time configured by the exchange (Stop Trading Duration). The Delay Open condition is removed when the Delay Open is cancelled by Market Operations or when the Delay Open timer elapses; if no Non Opening condition exists, then the book is opened with the current TOP.

Only one Delay Open is allowed per Opening procedure. If after a Delay Open the book goes into Non Opening, then an additional Delay Open after that Non Opening is not allowed.

2.1.2 Scenarios

In cases where the TOP can be determined, the last pair of orders/quotes matched determines the TOP. A buy limit order/quote and sell limit order/quote with equal size are matched at the average price of their limit.

The following table shows the possible combinations of the last pair of matched orders/quotes, the resulting TOP, and the reference to the scenario for more detail.

CLOB Auction Scenarios:

Matching Scenario	Result of Price Determination (TOP)	Scenario Reference
No Market Orders in the Book		
Order book not crossed	Order Book openable without price determination TOP: NULL	CAU1
LO/QU matches with LO/QU (deviation from reference price inside stop trading range)	Openable Opening Price: Arithmetic Mean if no limit better	CAU2
	Openable Opening Price: Remaining Buy LO/QU if better than Arithmetic Mean	CAU3
	Openable Opening Price: Remaining Sell LO/QU if better than Arithmetic Mean	CAU4
LO/QU matches with LO/QU (deviation from reference price outside stop trading range)	Delay Open TOP: Arithmetic Mean if no limit better	CAU5
	Delay Open TOP: Remaining Buy LO/QU if better than Arithmetic Mean	CAU6
	Delay Open TOP: Remaining Sell LO/QU if better than Arithmetic Mean	CAU7
With Market Orders in the Book		
Market Orders would remain after matching	Non Opening TOP: Null	CAU8
MO matches MO	Openable Opening Price = Reference Price	CAU9
	Openable Opening Price: Remaining Buy LO/QU if better than the Reference Price	CAU10
	Openable Opening Price: Remaining Sell LO/QU if better than the Reference Price	CAU11
MO matches MO	Delay Open TOP: Leads to a Delay Open condition	CAU12
	Delay Open TOP: Leads to a Delay Open condition	CAU13
LO/QU matches with MO	Openable Opening Price: Existing Limit price; no LO/QU left in book better than Limit Order Price	CAU14
	Openable Opening Price: Remaining Buy LO/QU if better than Limit Order Price	CAU15
	Openable Opening Price: Remaining Sell LO/QU if better than Limit Order Price	CAU16
LO/QU matches with MO	Delay Open TOP: Leads to a Delay Open condition	CAU17
	Delay Open TOP: Leads to a Delay Open condition	CAU18

Scenario	Auction
CAU1	No Orders matching

Reference Price = 50

Bid Size	T	Bid	Ask	T	Ask Size
100	O	50	53	O	120
200	QU	49	56	QU	100
100	QU	48			
500	O	46			

Results: TOP = Null
Book would open with no trades

Order Book not crossed
If there are no matches possible between Orders/Quotes, the theoretical opening price is set at NULL.

Scenario	Auction
CAU2	No limit Order left in book better than arithmetic mean of the last two limit Orders matched.

Price Step = 1
Reference Price = 44
Arithmetic Mean = 39.5 rounded to (40)

Bid Size	T	Bid	Ask	T	Ask Size
100	O	40	39	O	100
200	QU	39			

Results: TOP = 40
Book to open with volume 100 @ 40

Scenario	Auction
CAU3	Buy limit Order left in book better than arithmetic mean of the last two limit Order matched.

Price Step = 0.25
Reference Price = 44
Arithmetic Mean = 39.5

Bid Size	T	Bid	Ask	T	Ask Size
100	O	40	39	O	100
200	QU	(39.75)			

Results: TOP = 39.75
Book to open at volume 100 @ 39.75

Scenario	Auction
CAU4	Sell limit Order left in book better than arithmetic mean of the last two limit Order matched.

Price Step = 0.25
Reference Price = 44
Arithmetic Mean = 39.5

Bid Size	T	Bid	Ask	T	Ask Size
100	O	40	39	O	100
			(39.25)	QU	200

Results: TOP = 39.25
Book to open at volume 100 @ 39.25

Scenario	Auction
CAU5	TOP leads to a Delay Open condition

Reference Price = 50
Stop Trading Range = 5%
Arithmetic Mean = (53)

Bid Size	T	Bid	Ask	T	Ask Size
100	O	56	50	O	100

Results: TOP = 53
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

Scenario	Auction
CAU6	TOP leads to a Delay Open condition

Reference Price = 48
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	56	50	O	100
100	QU	(54)			

Results: TOP = 54
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

CAU7

Scenario	Auction
CAU7	TOP leads to a Delay Open condition

Reference Price = 45
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	56	48 ㊽	O QU	100 100

Results: TOP = 49
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

CAU8

Scenario	Auction
CAU8	Market Order remain unmatched in book

Reference Price = 50

Bid Size	T	Bid	Ask	T	Ask Size
100 50	O O	50 49	Market	O	300

Results: TOP = Null
Book condition Non Opening.

Non-opening; If any Market Orders remain unmatched, then a Non Opening condition is set, and a theoretical opening price cannot be determined.

CAU9

Scenario	Auction
CAU9	Market Orders matching; no orders left which are better than the reference price

Reference Price = ㊾

Bid Size	T	Bid	Ask	T	Ask Size
100 200	O O	Market 49	Market 51	O O	100 200

Results: TOP = 49
Book to open with volume 100 @ 49 (reference price)

CAU10

Scenario	Auction
CAU10	Remaining Buy LO/QU better than the Reference Price

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100 200 200	O QU O	Market ㊻ 45	Market	O	200

Results: TOP = 46
Book to open with volume 200 @ 46

CAU11

Scenario	Auction
CAU11	Remaining Sell LO/QU better than the Reference Price

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	Market	Market ㊷ 43	O O QU	50 100 100

Results: TOP = 42
Book to open with volume 100 @ 42

CAU12

Scenario	Auction
CAU12	TOP leads to a Delay Open condition

Reference Price = 50
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100 100	O QU	Market ㊼	Market	O	100

Results: TOP = 53
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

Scenario	Auction
CAU13	TOP leads to a Delay Open condition

Reference Price = 50
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	Market	Market (47)	O	100
				O	100

Results: TOP = 47
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

Scenario	Auction
CAU14	No limit Order left in book better than the limit Order price (for the limit Order)

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
200	O	Market	(45)	O	200
100	QU	41			
200	O	40			

Results: TOP = 45
Book to open with volume 200 @ 45

Scenario	Auction
CAU15	Buy limit Order left in book better than the sell limit price

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	Market	44	O	100
200	O	(45)			
100	QU	45			
500	O	44			

Results: TOP = 45
Book to open with volume 100 @ 45

Scenario	Auction
CAU16	Sell limit Order left in book better than the buy limit price

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	43	Market	O	100
			(42)	QU	100
			43	O	500
			44	O	200

Results: TOP = 42
Book to open with volume 100 @ 42

Scenario	Auction
CAU17	TOP leads to a Delay Open condition

Reference Price = 45
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	43	Market	O	150
100	QU	(42)			
500	O	41			
200	O	40			

Results: TOP = 42
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

Scenario	Auction
CAU18	TOP leads to a Delay Open condition

Reference Price = 38
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	43	Market	O	100
			(42)	QU	100
			43	O	500
			44	O	200

Results: TOP = 42
The book condition is Delay Open, because the TOP differs from the reference price by more than the stop trading range of 5%.

2.2 CLOB Continuous Trading Matching Rules

2.2.1 Principles

- An incoming order/quote is matched against orders/quotes taken from the other side of the book (in price-time sequence). A trade is only possible while the bid price (of the buy order/quote being considered) is greater than or equal to the ask price (of the sell order/quote being considered), or when one or more order is a market order thus giving rise to a crossed book.

- Each incoming order/quote can result in a number of trades, each of which can potentially have a different trade price.

- A new Trade Price can only be determined by an order/quote (incoming or existing) that matches against another order/quote. A new Trade Price must be better than or equal to the limit of the best order remaining in the book (for the incoming order/quote).

- Each time a match occurs, a Stop Trading Check is performed to determine whether a trade will be allowed. This check involves the comparison of the new trade price with the reference price before the current order was entered. The changes in the reference price are also taken into account over a predefined period of time (Avalanche Stop, as a general rule, 10 seconds). If the difference in these trade prices is more than or equal to the Stop Trading percentage range, then a Stop Trading condition occurs. The match that caused the Stop Trading condition does NOT create a trade. A Stop Trading condition halts trading in the book for a period of time defined by the exchange (Stop Trading Duration). The maximum allowable number of Stop Tradings in a day is set by the exchange for each book.

- The order type of the incoming order determines how the matching rules are applied

  - **Normal orders** and **Quotes** are matched to create trades until either:

    - they are completely matched,

    - a Stop Trading condition ensues – the book is placed into a Stop Trading state,

    - or no more matching is possible.

    Any remaining size is written to the book.

  - **Accept orders** are matched to create trades until either

    - they are completely matched,

    - a Stop Trading condition ensues – the book is NOT placed into a Stop Trading state,

    - or no more matching is possible.

    Any remaining size is NOT written to the book.

  - **Fill or Kill orders** must be able to be completely matched in order to create trades

    - if the whole Fill or Kill order is able to be filled (i.e. completely matched, without causing a Stop Trading condition), then trades are created,

♦ if the whole Fill or Kill order is not able to be filled, then it is killed (i.e. NO trades are created, and the order is NOT written to the book).

2.2.2 Scenarios

The trade price is determined each time a match occurs to produce a trade.

If there is a trade price that differs from the reference price by more than or equal to a predefined percentage, then a stop trading condition occurs.

If a stop trading condition exists and an incoming market order can not match completely then a stop trading with Non Opening condition exists.

CLOB - Continuous Trading:

Matching Scenario	Result of Price Determination	Scenario Reference
No Market Orders in the Book		
LO/QU matches with LO/QU	Existing LO/QU-Price	CCT1
	Stop Trading, because trade price differs from the reference price by more than the Stop Trading range	CCT2
	Stop Trading after Matching	CCT3
With Market Orders in the Book		
MO matches MO	Trade Price = Reference Price	CCT4
	Remaining Buy LO/QU in book better than the reference price (for the incoming market order)	CCT5
	Remaining Sell LO/QU in book better than the reference price (for the incoming market order)	CCT6
MO matches with LO/QU	Trade Price = Best existing LO/QU-Price	CCT7
	No LO/QU better than the incoming LO/QU-Price	CCT8
	Remaining Buy LO/QU better than the incoming LO/QU-Price	CCT9
	Remaining Sell LO/QU better than the incoming LO/QU-Price	CCT10
	Stop Trading (with Non Opening), because trade price differs from the reference price by more than the Stop Trading range and incoming market order can not be completely matched	CCT11

Scenario CCT1	Continuous Trading **Buy limit Order better than or equal to the incoming sell limit Order price (for the incoming limit Order)**					
Reference Price = 42						
Bid Size	**T**	**Bid**	**Ask**	**T**	**Ask Size**	
100	O	(40)	**39**	**O**	**100**	
100	O	38	41	O	100	
100	QU	38	43	QU	100	
Results:	**REF = 40** **Trade with volume 100 @ 40**					

The trade price is determined each time a match occurs to produce a trade and compared to the original reference price. A Stop Trading condition occurs if a trade price would differ from the original reference price by more than or equal to a predefined percentage.

In Stop Trading, the Auction matching rules apply and the TOP is determined.

Scenario CCT2	Continuous Trading The difference between trade price and reference price exceeds the stop trading range.

Reference Price = 50
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	56	50	O	100

Results:	The book goes into Stop Trading TOP = (53)

Scenario CCT3	Continuous Trading The difference between trade price and reference price exceeds the stop trading range.

Reference Price = 50
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
100	O	51	(47)	O	1000
100	O	49			
100	O	47			

Results:	Trade with volume 100 @ 51 Trade with volume 100 @ 49 Then book goes into Stop Trading TOP = 47

Scenario CCT6	Continuous Trading Sell limit Order in book better than the reference price (for the incoming Market Order)

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	Market	Market	O	100
			(42)	O	100
			43	QU	100
			44	O	100

Results:	REF = 42 Trade with volume 100 @ 42

Scenario CCT7	Continuous Trading Incoming Market Order matches against the best limit in the book which is an Order.

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
200	O	Market	(46)	O	200
100	O	41			
100	O	40			

Results:	REF = 46 Trade with volume 200 @ 46

Scenario CCT8	Continuous Trading No limit Orders/Quotes better than the incoming limit Order price (for the incoming limit Order)

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
200	O	Market	⃝46	O	200
100	QU	41			
100	O	40			

Results:	REF = 46 Trade with volume 200 @ 46

Scenario CCT9	Continuous Trading Buy limit Order/Quote better than the incoming limit Order price (for the incoming limit Order)

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
200	O	Market	42	O	200
100	O	⃝46			
100	QU	40			

Results:	REF = 46 Trade with volume 200 @ 46

Scenario CCT10	Continuous Trading Sell limit Order/Quote better than the incoming limit Order price (for the incoming limit Order)

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
200	O	43	Market	O	200
			⃝42	O	200
			43	QU	200

Results:	REF = 42 Trade with volume 200 @ 42

Scenario CCT11	Continuous Trading An incoming Market Order cannot be completely matched

Reference Price = 50
Stop Trading Range = 5%

Bid Size	T	Bid	Ask	T	Ask Size
400	O	Market	56	O	100
100	O	55			

Results:	TOP = Null The book condition is now Stop Trading with Non Opening

3. Matching Rules – Market Maker Book (MMB)

The MMB is used for international bonds, ETF, ETSF and securitized derivatives (Scoach Schweiz AG).

3.1 MMB Auction Matching Rules

3.1.1 Principles

Auction matching rules are used to determine a TOP.

The orders and quotes in the book are "theoretically" matched (i.e. no updates to the book are performed, and no trades are produced) in order to determine the TOP (i.e. the Opening price that would result if the book were to open at that point).

3.1.1.1 Principles and Opening Price

- The Opening Trade Price is the last calculated TOP during Preopening.

- The trade price for all trades created during Opening is the Opening Trade Price.

- Opening is only performed if the book is in an openable condition, as determined during Preopening.

3.1.1.2 Calculation of the TOP

Orders/quotes are taken from one side of the book (in price-time sequence) and matched against the orders/quotes from the opposite side of the book (in price-time sequence).

This is only possible while the bid price (of the buy order/quote being considered) is greater than or equal to the ask price (of the sell order/quote being considered) thus giving rise to a crossed book.

Matching continues until one of the following two conditions prevail:

- No more orders/quotes are left on one side of the book.

- No more orders/quotes can be matched (bid price is less than the ask price).

The last pair of orders/quotes matched forms the basis for the determination of the TOP, together with the best remaining limit order/quote in the book, and the reference price.

The TOP must be better than or equal to the limit of the best orders/quotes (buy and sell) remaining in the book.

If no TOP can be calculated the TOP is "NULL".

3.1.1.3   Conditions to be able to calculate a TOP

- The TOP must lie on a valid price step.

- All market orders must be matched in order to be able to determine a TOP, and so to prevent a Non Opening condition.

- If orders would match in the Opening and there is no quote available in the book, then a Delay Open condition exists. A Delay Open condition delays the Opening for a period of time defined by the exchange (Stop Trading Duration). After this time elapses (and a Non Opening condition does not exist) the Opening procedure will be performed irrespective of the TOP. This Delay Open can also be stopped if there is an incoming quote or a manual cancellation.

Only one Delay Open is allowed per Opening procedure. If after a Delay Open a Non Opening follows, then an additional Delay Open after that Non Opening is not allowed.

3.1.2   Scenarios

With the exception of the Delay Open rule, the determination of the Opening price in the MMB is the same as in the CLOB. **The quote-based price determination does not apply in Preopening.**

MMB Auction Scenarios:

Matching Scenario	Result of Price Determination (TOP)	Scenario Reference
No Market Orders in the Book		
Order book not crossed	Order Book openable without price determination TOP: NULL	Like CLOB (see 2.1.2) CAU1
LO/QU matches with LO/QU (quote in book)	Openable Opening Price: Arithmetic Mean if no limit better	Like CLOB (see 2.1.2) CAU2
	Openable Opening Price: Remaining Buy LO/QU if better than Arithmetic Mean	Like CLOB (see 2.1.2) CAU3
	Openable Opening Price: Remaining Sell LO/QU if better than Arithmetic Mean	Like CLOB (see 2.1.2) CAU4
LO matches with LO (no quote in book)	**Delay Open** Opening Price: Arithmetic Mean if no limit better	**MAU1**
	Delay Open TOP: Remaining Buy LO if better than Arithmetic Mean	**MAU2**
	Delay Open TOP: Remaining Sell LO if better than Arithmetic Mean	**MAU3**
With Market Orders in the Book		
MO matches MO (quote in book)	Non Opening Market Orders would remain after matching	Like CLOB (see 2.1.2) CAU8
	Openable Opening Price = Reference Price	Like CLOB (see 2.1.2) CAU9
	Openable Opening Price: Remaining Buy LO/QU if better than the Reference Price	Like CLOB (see 2.1.2) CAU10
	Openable Opening Price: Remaining Sell LO/QU if better than the Reference Price	Like CLOB (see 2.1.2) CAU11
MO matches MO (no quote in book)	Delay Open TOP: Remaining Buy LO/QU if better than the Reference Price	Like CLOB (see 2.1.2) CAU12
	Delay Open TOP: Remaining Sell LO/QU if better than the Reference Price	Like CLOB (see 2.1.2) CAU13
LO/QU matches with MO (quote in book)	Openable Existing Limit price; no LO/QU left in book better than Limit Order Price	Like CLOB (see 2.1.2) CAU14
	Openable Remaining Buy LO/QU if better than Limit Order Price	Like CLOB (see 2.1.2) CAU15
	Openable Opening Price: Remaining Sell LO/QU if better than Limit Order Price	Like CLOB (see 2.1.2) CAU16
LO matches with MO (no quote in book)	**Delay Open (with Non Opening)** No quote in the book	**MAU4**

The same rule applies in CLOB and MMB for Non Opening.

If orders can match but there is no quote in the book, then the Delay Open condition is set.

Scenario MAU1	Auction Orders can match but no Quote in the book				
Price Step = 1 Reference Price = 44 Arithmetic Mean = 39.5 rounded to �40					
Bid Size	T	Bid	Ask	T	Ask Size
100 200	O O	40 39	39	O	100
Results:	TOP = 40 Book to go into delay open				

Scenario MAU2	Auction no Quote in the book; Buy limit Order left in book better than arithmetic mean				
Price Step = 0.25 Reference Price = 44 Arithmetic Mean = 39.5					
Bid Size	T	Bid	Ask	T	Ask Size
100 200	O O	40 ⟨39.75⟩	39	O	100
Results:	TOP = 39.75 Book to go into delay open				

Scenario MAU3	Auction no Quote in the book; Sell limit Order left in book better than arithmetic mean				
Price Step = 0.25 Reference Price = 44 Arithmetic Mean = 39.5					
Bid Size	T	Bid	Ask	T	Ask Size
100	O	40	39 ⟨39.25⟩	O O	100 200
Results:	TOP = 39.25 Book to go into delay open				

Scenario MAU4	Auction Market buy Order can match only partially and there is no Quote in the book				
Reference Price = 50					
Bid Size	T	Bid	Ask	T	Ask Size
10000 200	O O	Market 51	51	O	200
Results:	TOP = Null Delay Open (no Quote in the book) ➜ Non Opening (unmatched Market Order)				

3.2 MMB Continuous Trading Matching Rules

3.2.1 Principles

- An incoming order/quote is matched against orders/quotes taken from the other side of the book (in price-time sequence). A trade is only possible while the bid price (of the buy order/quote being considered) is greater than or equal to the ask price (of the sell order/quote being considered), or when one or more order is a market order thus giving rise to a crossed book.

- Each incoming order/quote can result in a number of trades, each of which can potentially have a different trade price.

- A new Trade Price can only be determined by an order/quote (incoming or existing) that matches against another order/quote.

- If an incoming quote can match against one or more existing orders, then the quote determines the execution price, as long as the new Trade Price is better than or equal to the limit of the best order remaining in the book (quote-based price determination).

- If an incoming order can match but there is no quote on the opposite side in the book, then a Stop Trading condition exists. The Stop Trading condition will not occur if the maximum allowable number of Stop Tradings in a day (set by Market Operations after the trading day) has been exceeded or if the Stop Trading has been de-activated (intraday) by the Market Operations.

  In case of Stop Trading, no trade is created, and matching is halted for a period of time defined by the exchange (Stop Trading Duration). The stop trading condition is removed when a quote is entered at the opposite side of the book, when the stop trading is cancelled by Market Operations or when the stop trading timer elapses; if no Non Opening condition exists, then the book is reopened with the current TOP.

- The order type of the incoming order determines how the matching rules are applied

  - **Normal orders** are matched to create trades until either:

    - they are completely matched, or

    - a Stop Trading condition ensues – the book is placed into a Stop Trading state, or

    - no more matching is possible.

    Any remaining size is written to the book.

  - **Accept orders** are matched to create trades until either

    - they are completely matched, or

    - a Stop Trading condition ensues – the book is NOT placed into a Stop Trading state, or

    - no more matching is possible.

    Any remaining size is NOT written to the book.

  - **Fill or Kill orders** must be able to be completely matched in order to create trades

    - if the whole Fill or Kill order is able to be filled (i.e. completely matched, without causing a Stop Trading condition), then trades are created.

    - if the whole Fill or Kill order is not able to be filled, then it is killed (i.e. NO trades are created, and the order is NOT written to the book).

  - A **quote** is matched to create trades until:

    - it is completely matched, or

    - no more matching is possible.

3.2.2 Scenarios

The trade price is determined each time a match occurs to produce a trade.

Quote-based price determination occurs when an incoming quote matches a limit order and no limit orders with a better price are left on the other side of the book. In this case the price of the quote is used.

If an incoming order can match but there is no quote on the opposite side in the book, then a Stop Trading condition exists.

3.2.2.1 Incoming Quote against Quote

The incoming quote matches against the best quote in the book (bid price >= ask price). The best quote in the book determines the price.

3.2.2.2 Incoming Quote against Limit Orders / Quotes

An incoming quote matches against one or more of the best limit orders in the book.

Quote-based price determination:

- Matching takes place at the price of the quote instead of the price of the existing limit order (as long as there is no surplus on the order side).

- If limit orders remain on the order side that are better than the quote limit, then the best order limit determines the price.

- If a matchable quote exists on the opposite side of the incoming quote, orders with better time-price-priority and quotes are matched at the price of the existing quote.

The following table gives an overview of several scenarios in MMB:

MMB - Continuous Trading:

Matching Scenario	Result of Price Determination	Scenario Reference
LO/MO matches against LO/MO/QU	Existing LO/QU-Price	Like CLOB (see 2.2.2) CCT1
QU/LO matches with MO	Incoming QU-Price	Like CLOB (see 2.2.2) CCT7
QU matches with LO	Price of incoming QU because there's no better price in the book than the quote price => **Quote-based price determination**	MCT1
	Price of incoming QU because there's no better price in the book than the quote price => **Quote-based price determination**	MCT2
	Price of remaining Buy LO/QU => **Quote-based price determination**	MCT3
QU matches with LO/QU	Price of remaining existing QU => **Quote-based price determination**	MCT4
	Price of matched existing QU => **Quote-based price determination**	MCT5
	Price of remaining existing QU => **Quote-based price determination**	MCT6
	Price of matched existing QU and remaining limit => **Quote-based price determination**	MCT7
	Price of matched existing QU and incoming quote => **Quote-based price determination**	MCT8
LO matches with LO	**Stop Trading** (no Quote in the book on the opposite side of the incoming order)	MCT9
	Stop Trading (no Quote in the book on the opposite side of the incoming order) after Matching	MCT10
	No Stop Trading, if matching at the same price as the last matched existing quote	MCT11
	Stop Trading (no Quote in the book on the opposite side of the incoming order) => **Non Opening**	MCT12

Scenario MCT1	Continuous Trading Quote–based price determination; no Orders remain in the book which are better than the Quote

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	51	(50)	QU	200
200	O	49			

Results: REF = 50
Trade with volume 100@50

Quote-based price determination: use Quote price because there's no better price in the book than the Quote price

Scenario MCT2	Continuous Trading Quote-based price determination; no Orders remain in the book which are better than the Quote

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	46	(44)	QU	300
100	O	45			
100	O	45			

Results: REF = 44
Trades with volume 300@44

Quote-based price determination: use Quote price because there's no better price in the book than the Quote price

Scenario MCT3	Continuous Trading Quote-based price determination; buy limit Order better than the incoming Quote price

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	46	44	QU	150
100	O	(45)			
100	O	44			

Results: REF = 45
Trade with volume 100@45
Trade with volume 50@45
because remaining best buy Order 50@45

Scenario MCT4	Continuous Trading Quote-based price determination with Quotes and Orders on the opposite side of incoming Quote

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	45	39	QU	200
100	O	44			
100	QU	(43)			
100	O	42			
100	QU	41			
100	O	40			

Results: REF = 43
Two trades with volume 100@43 | price of remaining existing Quote

Scenario MCT7	Continuous Trading Quote-based price determination with quotes and orders on the opposite side of incoming quote

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	45	39	QU	550
100	O	44			
100	QU	43			
100	O	42			
100	QU	41			
100	O	(40)			

Results: REF = 40
Three trades with volume 100@43 | price of matched existing quote
Two trades with volume 100@41 |
Trade with volume 50@40 | price of remaining limit

Scenario MCT8	Continuous Trading Quote-based price determination with quotes and orders on the opposite side of incoming quote

Reference Price = 44

Bid Size	T	Bid	Ask	T	Ask Size
100	O	45	(39)	QU	1000
100	O	44			
100	QU	43			
100	O	42			
100	QU	41			
100	O	40			

Results: REF = 39
Three trades with volume 100@43 | price of matched existing quote
Two trades with volume 100@41 |
Trade with volume 100@39 | price of incoming quote

Scenario MCT11	Continuous Trading Incoming Market sell Order matches against Quotes and Orders				
Reference Price = 50					

Bid Size	T	Bid	Ask	T	Ask Size
100 300 200	O QU O	52 51 (51)	Market	O	500

Results:	REF = 51 Trade with volume 100@52 Trade with volume 300@51 Trade with volume 100@51 No Stop Trading if the remaining Order(s) can match at the same price as the last matched existing Quote

Scenario MCT12	Continuous Trading Incoming Market buy Order can only partially match and no Quote on the opposite side				
Reference Price = 50					

Bid Size	T	Bid	Ask	T	Ask Size
10000 200	O O	**Market** 50	51	O	200

Results:	TOP = Null Stop Trading (no Quote on the sell side) ➔ Non Opening (unmatched Market Order)

Stop Trading with Non Opening in MMB

4. Matching Rules - Market Maker Book "Fill or Kill" (MMB-FoK)

This book is used for international bonds with minimum denomination > smallest tradable unit.

4.1 MMB-FoK Auction Matching Rules

4.1.1 Principles

Auction matching rules are used to determine a TOP.

In the case of the MMB-FoK, only quotes may be in the book. The book is thus always "openable". To ensure a transparent TOP calculation the entered quotes must be a multiple of the minimum denomination or else are rejected. If no TOP can be calculated the TOP is "NULL".

During the auction all incoming orders are rejected.

Trades in the Opening can only result out of matching between quotes.

4.1.2 Scenarios

The following table shows the possible combinations of the last pair of matched orders, the resulting TOP, and the reference to the scenarios for more detail (only possible with multiple Market Makers):

MMB-FoK Auction Scenarios:

Matching Scenario	Result of Price Determination (TOP)	Scenario Reference
Order book not crossed	Order Book openable without price determination TOP: NULL	FAU1
QU matches with QU	Price according the principle of highest volume transacted	FAU2

In the following scenarios minimum denomination is set at 50,000 and the price step is set at 0.10:

Scenario FAU1 — Auction — No matching Quotes

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.40	101.80	QU	100'000
150'000	QU	101.20	102.00	QU	150'000

Results: TOP = Null
Book would open with no trades

Order Book not crossed
If there are no matches possible between Quotes, the theoretical opening price is set at NULL.

Scenario FAU2 — Auction — No matching Quotes

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	101.40	QU	150'000
100'000	QU	101.40	101.80	QU	250'000

Results: REF = 101.40

Trade with volume 100'000 @ 101.40
Trade with volume 50'000 @ 101.40

4.2 MMB-FoK Continuous Trading Matching Rules

4.2.1 Principles

All incoming orders must be either fully matched, with each partial execution at or above the minimum denomination, or are rejected. **Orders are not entered in the book.**

This rule applies to all order types supported (normal, accept, Fill or Kill).

An incoming quote matches with existing quote(s) as long as the resulting trades are not below the minimum denomination. **Remaining quotes with sizes below the minimum denomination are automatically deleted.**

4.2.2 Scenarios

The following table gives an overview of several scenarios in MMB-FoK:

MMB-FoK - Continuous Trading:

Matching Scenario	Result of Price Determination	Scenario Reference
No Market Orders in the Book		
LO/QU matches with QU	Price of matched existing QU; unmatched part of QU deleted	FCT1
	Price of matched existing QU; unmatched part of quote remains in book	FCT2
	No Trade!	FCT3
	No Trade!	FCT4
With Market Orders in the Book		
MO matches with QU	Price of matched existing QU; unmatched part of quote deleted	FCT5
	Price of matched existing QU; unmatched part of quote remains in book	FCT6
	No Trade!	FCT7
	No Trade!	FCT8

In the following scenarios minimum denomination is set at 50,000 and the price step is set at 0.10:

Scenario FCT1	Continuous Trading Quotes in book, incoming Order matches existing Quotes

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	(101.50)	**101.40**	O	80'000
100'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results:	REF = 101.50 Trade with volume 80'000 @ 101.50 Unmatched quote of size 20'000 deleted, because it's lower than the minimum denomination

Scenario FCT2	Continuous Trading Quotes in book, incoming Order matches existing Orders/Quotes

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	**101.40**	O	150'000
100'000	QU	(101.40)	101.80	QU	250'000
			101.90	QU	250'000

Results:	REF = 101.40 Trade with volume 100'000 @ 101.50 Trade with volume 50'000 @ 101.40

Scenario FCT3 — Continuous Trading
No Trade! Incoming Order cannot be fully matched with partial executions at or above the min.denom.

Reference Price = (101.40)

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	~~101.40~~	O	~~140'000~~
100'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.40

No trade!
The incoming order is rejected, because one resulting trade would be below the minimum denomination

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Scenario FCT4 — Continuous Trading
No Trade! Incoming Order cannot be fully matched with partial executions at or above the min.denom.

Reference Price = (101.50)

Bid Size	T	Bid	Ask	T	Ask Size
250'000	QU	101.50	~~101.40~~	O	~~280'000~~
250'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.50

No trade!
The incoming order is rejected, because one resulting trade would be below the minimum denomination

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Scenario FCT5 — Continuous Trading
Minimum denomination
Quotes in book, incoming Market Orders

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	(101.50)	Market	O	80'000
100'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.50
Trade with volume 80'000 @ 101.50

Unmatched quote of size 20'000 deleted, because it's lower than the minimum denomination!

Scenario 3.2 FCT6 — Continuous Trading
Minimum denomination
Quotes in book, incoming Market Orders

Reference Price = 101.40

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	Market	O	150'000
100'000	QU	(101.40)	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.40
Trade with volume 100'000 @ 101.50
Trade with volume 50'000 @ 101.40

Scenario FCT7 — Continuous Trading
Minimum denomination
Quotes in book, incoming Market Orders

Reference Price = (101.40)

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	Market	O	249'000
100'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.40
No trade!
The incoming market order is rejected, because the incoming order does not match completely.

Scenario FCT8 — Continuous Trading
Minimum denomination
Quotes in book, incoming Market Orders

Reference Price = (101.40)

Bid Size	T	Bid	Ask	T	Ask Size
100'000	QU	101.50	Market	O	140'000
100'000	QU	101.40	101.80	QU	250'000
			101.90	QU	250'000

Results: REF = 101.40
No trade!
The incoming market order is rejected, because one resulting trade of 40'000 would be lower than minimum denomination.

5. Appendix

5.1 Terms & Abbreviations

The following abbreviations are used in this document:

Abbreviation	Description
CLOB	Central Limit Order Book
LO	Limit Order
MMB	Market Maker Book
MMB-FoK	Market Maker Book – Fill or Kill
MO	Market Order
QU	Quote
QS	Quote System
SWX	Former name of SIX Swiss Exchange
SWXess	New trading platform of SIX Swiss Exchange
TOP	Theoretical Opening Price

5.2 Representation of Matching Rules Scenarios

Matching rules scenarios presented in the previous chapters use the structure and the abbreviations explained in the figure below: