**The key venues & how they work**

**1) Aquis Market at Close (MaC)**

**What it is:** A lit, alternative closing auction that **executes at the *primary* exchange’s official closing price** (PCP) — designed to give cheaper, competing capacity at the close. [aquis.eu](https://www.aquis.eu/markets/market-at-close)

**Mechanics (4 phases):**

1. **Unlocked phase** starts when the primary begins its close auction; orders (incl. market orders) can be entered/amended/cancelled.
2. **Random lock** occurs mid-auction (random point within a 30-second window).
3. **Locked phase** (no changes; matching by member/time priority).
4. **Execution**: If the primary publishes a valid closing price, matched orders print **at that price**; **unmatched orders are cancelled** (giving you time to re-route to the primary if needed). If the primary auction is extended or cancelled, MaC orders are rejected/cancelled for that stock. [aquis.eu](https://www.aquis.eu/markets/market-at-close)

**Notables:** “Fraction of the cost” vs primary close fees; approved by FCA/AMF; no order-size caps; member/time matching priority. [aquis.eu](https://www.aquis.eu/markets/market-at-close)

**2) Turquoise Plato Trade At Last™ (TAL)**

**What it is:** A **dark** post-close matching phase that **prints at the *primary* closing price**. Supports both **firm** and **conditional (block)** interest (via Plato Block Discovery). [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)[The TRADE](https://www.thetradenews.com/turquoise-plato-trade-at-last-closing-auction-mechanism-goes-live/?utm_source=chatgpt.com)

**Mechanics & window:**

* During the day, Turquoise Plato matches at the **primary midpoint (RPW)**; after the primary’s closing auction finishes and publishes the official close, it switches into **Trade At Last** and matches **at the PCP** **until 16:45 UK time**.
* TAL only runs if a **valid PCP** is published **before 16:45**; otherwise it does not match that day. [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)

**Reg basis & order types:** Leverages **Reference Price Waiver (RPW)** and **Large-in-Scale (LIS)** waivers; accepts firm and conditional blocks; persists resting Plato interest into the TAL phase. Available on **TGHL (UK)** and **TGHE/TQEX (EU)** MTFs. [docs.londonstockexchange.com+1](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)[TradingHours](https://www.tradinghours.com/mic/s/tqex?utm_source=chatgpt.com)

**3) Cboe Closing Cross (3C)**

**What it is:** A **post-market crossing session** (not a “trade-at-close-price” book). You submit **limit orders** after continuous trading ends; Cboe runs **back-to-back 15-second crossing periods** over ~**25 minutes** with its own **price-formation algorithm**. Prints are **not pegged to the primary close**; the cross chooses a single match price that maximises executable volume (tie-breaks to proximity to last price, then highest price). [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Key rules:**

* **Limit orders only**, on-tick; optional **MinQty**; no price improvement; **static price collars** (±15%/±20% depending on liquidity) referenced to recent prices/CBBO/previous primary close.
* Identified under **BATE (BXE)** / **CEUX (DXE)**; flagged as **Periodic Auction / out-of-session**.
* Typical session: from continuous end to **+25 minutes**, with 15-second crosses. (Segment-specific start/end times vary.) [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Quick comparison (what prints where)**

| **Venue** | **Price** | **When it runs** | **Pre-trade model** | **Primary dependency** | **Typical use case** |
| --- | --- | --- | --- | --- | --- |
| **Aquis MaC** | **Primary closing price** | Parallel with primary close (locks mid-auction; executes right after close) | **Lit**, member/time priority | Needs a valid PCP; cancels if primary auction extended/cancelled | Cheaper PCP fills; keep some flow out of crowded primary; get **price certainty** with earlier lock. [aquis.eu](https://www.aquis.eu/markets/market-at-close) |
| **Turquoise TAL** | **Primary closing price** | After the primary publishes PCP, up to **16:45 UK** | **Dark**, RPW + **LIS** (firm & conditional) | Runs only if PCP available before 16:45 | **Block/conditional** interest at PCP; extra PCP capacity post-close. [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf) |
| **Cboe 3C** | **Own cross price (not PCP)** | Post-close, ~**25 min** in 15-sec windows | Periodic cross; **limit-only**; static collars | Independent of PCP | Work residual at your chosen limit after the close; discretionary end-of-day rebalancing. [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf) |

**Pros & cons in practice**

**Aquis MaC**  
**Pros:** PCP prints with **earlier lock** (reduces last-second imbalance games); **cost savings** vs primaries; unmatched orders cancelled in time to redirect; simple connectivity (same as Aquis lit). **Cons:** **Fill risk** if no contra; still **not the official auction**; operational dependency on the primary (extensions cancel MaC participation); fragmenting size away from the primary can dilute your auction leverage. [aquis.eu](https://www.aquis.eu/markets/market-at-close)

**Turquoise TAL**  
**Pros:** PCP prints **after** the primary; supports **conditional/LIS blocks** — good for sizeable, low-footprint crosses; re-uses your Plato workflow. **Cons:** No TAL if the **PCP isn’t available before 16:45**; not the official close; purely offsetting interest (no match → no fill). [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)

**Cboe 3C**  
**Pros:** **Extra post-close liquidity window**; **price discretion** (set your limit); frequent mini-crosses can find contra without live-auction signalling; risk controls via **static collars**. **Cons:** **Not at PCP** (basis risk vs official close); **limit-only**; not part of the benchmarked close; liquidity varies by name; some instruments (e.g., REGM ETFs) excluded. [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Liquidity & market-structure context**

* Across Europe, **closing mechanisms** (primary + alternatives) are a big deal: ~**18%** of consolidated turnover in STOXX 600 names (Jan-2021 to Sep-2022). That’s why venues compete hard around the close. [SSRN](https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID4639927_code2377732.pdf?abstractid=4533545&mirid=1&utm_source=chatgpt.com)
* Aquis positions MaC as **“Europe’s largest closing auction”** and highlights lower fees; treat that as a **marketing claim** and check internal fill stats by name. [aquis.eu](https://www.aquis.eu/markets/market-at-close)
* Turquoise publicly notes TAL’s **firm + conditional** support and post-close window, specifically **to 16:45 UK**. [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)[The TRADE](https://www.thetradenews.com/turquoise-plato-trade-at-last-closing-auction-mechanism-goes-live/?utm_source=chatgpt.com)
* Cboe publishes detailed **3C** specs: **15-second** crossing periods across **~25 minutes**, **limit-only**, **collars**, and **price-formation** logic distinct from PCP. [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Routing playbook (what most buy-/sell-sides do)**

1. **Anchor in the primary** for benchmarked flow (you need official close participation).
2. **Layer MaC** for price-certain PCP fills at lower cost and to avoid adding to visible primary imbalances; consider the lock timing so you can still redirect if size doesn’t match. [aquis.eu](https://www.aquis.eu/markets/market-at-close)
3. **Use TAL** to sweep **dark/LIS PCP** interest after the close (firm + conditional). Great for high-touch/PT names where you have blocks to pair. [docs.londonstockexchange.com](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)
4. **Work residuals in 3C** if you want discretion on price **post-close** (accepting basis risk vs PCP). The 15-sec cadence can find natural contra with less crowding. [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Handy venue specifics (quick reference)**

* **Aquis MaC (AQXE/AQEU)**: sequential phases; random lock mid-auction; cancels if primary extends; executes at PCP; member/time priority; “fraction of cost”. [aquis.eu+1](https://www.aquis.eu/markets/market-at-close)
* **Turquoise TAL (TGHL UK / TGHE/TQEX EU)**: day = midpoint; **TAL = PCP** after close, **until 16:45 UK**; **RPW + LIS**, **firm + conditional** allowed; Plato interest persists into TAL. [docs.londonstockexchange.com+1](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-trading-services-description-v3_40_i5.pdf)[TradingHours](https://www.tradinghours.com/mic/s/tqex?utm_source=chatgpt.com)
* **Cboe 3C (BATE/CEUX)**: **post-market** 25-min session; **15-sec crosses**; **limit-only**; static collars (±15%/±20%); price chosen by crossing algorithm; not PCP. [cdn.cboe.com](https://cdn.cboe.com/resources/participant_resources/BCE-GuidanceNote_3C_Final.pdf)

**Explicit venue fees (close)**

| **Venue** | **What you pay to execute** | **Notes** |
| --- | --- | --- |
| **Primary exchange (example: LSE SETS close)** | **0.45 → 0.35 → 0.25 bps** (banded by monthly value traded). Minimum **£0.11** per executed order. | LSE publishes a single equity value-traded scheme that applies to electronic executions (incl. auctions). No separate “close surcharge” is listed in the public tariff. Other schemes (e.g., LPS, Liquidity Taker Packages) can alter your effective rate. [London Stock Exchange Docs](https://docs.londonstockexchange.com/sites/default/files/documents/trading-services-price-list-january-2025.pdf) |
| **Aquis Market-at-Close (MaC)** | **Either** fixed **£30,000 / month** (unlimited MaC messages) **or** **0.1 bps** on MaC traded value (member can elect; 6-month minimum; 3-month notice to switch). | MaC executes **at the primary official close price**. Aquis positions MaC as a lower-cost alternative to national exchanges’ close; MaC messages don’t count towards Aquis’ message-based tiers. [aqx-web-prod-s3-public-read.s3.eu-west-2.amazonaws.com+1](https://aqx-web-prod-s3-public-read.s3.eu-west-2.amazonaws.com/Aquis_Fee_Schedule_effective_1_April_2025_5e7ccb68d8.pdf)[Aquis](https://www.aquis.eu/markets/market-at-close?utm_source=chatgpt.com) |
| **Turquoise Plato Trade-At-Last (TAL)** | **No incremental TAL fee**; TAL prints are charged **as per Turquoise Plato Order Book** (**0.30 bps** standard EU tariff). | TAL matches **at the primary close price** after the close (up to 16:45 UK). Supports firm + conditional (LIS) interest. [London Stock Exchange Docs+1](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-europe-tariff-schedule-2.6ii-eff.-1-jan-2025.pdf) |
| **Cboe Closing Cross (3C)** | **Free** for standard 3C executions (fee code **CC**). **0.075** (bps) if the match is **self-match** (fee code **CS**). | 3C is a **post-close periodic cross** with its own price formation; **not pegged to PCP**. Fees are quoted **per side** on Cboe’s schedule. [Cboe Global Markets+1](https://www.cboe.com/europe/equities/participation/fee_schedule/) |

**Rule-of-thumb all-in venue fee per £10m executed (illustrative):**

* LSE primary close @ **0.35 bps** mid-band ≈ **£3,500**. [London Stock Exchange Docs](https://docs.londonstockexchange.com/sites/default/files/documents/trading-services-price-list-january-2025.pdf)
* Aquis MaC @ **0.1 bps** ≈ **£1,000** (or **£0** marginal if you’re already on the **£30k/mo** fixed plan and under its cap). **Fixed vs variable MaC break-even ≈ £3bn** MaC notional per month. [aqx-web-prod-s3-public-read.s3.eu-west-2.amazonaws.com](https://aqx-web-prod-s3-public-read.s3.eu-west-2.amazonaws.com/Aquis_Fee_Schedule_effective_1_April_2025_5e7ccb68d8.pdf)
* Turquoise TAL @ **0.30 bps** ≈ **£3,000**. [London Stock Exchange Docs](https://docs.londonstockexchange.com/sites/default/files/documents/turquoise-europe-tariff-schedule-2.6ii-eff.-1-jan-2025.pdf)
* Cboe 3C **Free** (standard) = **£0**; **£750** if self-matched (0.075 bps). [Cboe Global Markets](https://www.cboe.com/europe/equities/participation/fee_schedule/)

Notes: Figures exclude broker commissions, exchange membership/connectivity, and CCP/settlement fees. Statutory taxes (e.g., UK SDRT, FR/ES/IT FTT) depend on **instrument jurisdiction**, not venue.

**Implicit / practical cost drivers (quick matrix)**

| **Factor** | **Primary closing auction** | **Aquis MaC** | **Turquoise TAL** | **Cboe 3C** |
| --- | --- | --- | --- | --- |
| **Benchmark certainty** | **Official PCP** | PCP (same as primary) | PCP (same as primary) | **Not** PCP (basis risk) |
| **Fill probability / depth** | **Highest** (crowded) | Good, but contingent on contra | Good for **blocks/conditional** | Varies; depends on cross interest |
| **Impact risk** | Higher (visible imbalances) | Lower vs primary (earlier lock) | Low (post-close PCP) | Low (post-close), but not PCP |
| **Info leakage** | Auction IOI streams visible | Lower (order lock then print) | Low (dark/conditional) | Low-moderate (visible 3C book) |
| **Operating risk** | Cut-off sensitive | Dependent on primary publishing PCP | Runs only if PCP published by cut-off | Runs regardless of PCP |

**1. Primary Exchange Closing Auctions (Official MOC)**

**NYSE Closing Auction**

* **Official close for NYSE-listed securities**.
* **Order types**:
  + **MOC** (Market-on-Close): market-priced, executes at official closing price.
  + **LOC** (Limit-on-Close): limit-priced, executes if limit is compatible with closing price.
  + **D Orders**: designed for Designated Market Makers (DMMs) to offset imbalance.
* **Cut-offs**:
  + 15:45 ET – MOC/LOC orders can be entered/modified.
  + 15:50 ET – imbalance publication begins (updates every 5 seconds).
  + 15:55 ET – no more cancellations/reductions allowed (except legitimate error).
* **Price determination**: Auction price determined by supply/demand crossing, overseen by the **DMM** (still unique to NYSE).

**Nuances**:

* NYSE allows *D Orders* and *Supplemental Liquidity Providers* to help manage imbalances.
* DMMs can use discretion (within bands) to stabilise close → adds “human element” not seen on fully electronic markets.
* Transparency: imbalance feed every 5s gives traders ability to react, but can also create signalling risk.

**NASDAQ Closing Cross**

* **Official close for NASDAQ-listed securities**.
* **Order types**:
  + MOC, LOC, Imbalance-Only (IO), Early IO orders.
* **Cut-offs**:
  + 15:50 ET – final cut-off for MOC/LOC (except to correct errors).
  + Continuous IO order entry/modifications up to 16:00.
* **Mechanics**: Fully electronic cross, no DMM.
* **Transparency**: NASDAQ disseminates **Net Order Imbalance Indicator (NOII)** every 5 seconds from 15:50 to 16:00.
* **Price determination**: Algorithm maximises executable volume, minimises imbalance, minimises distance from last sale.

**Nuances**:

* Very **mechanical/transparent** process, in contrast to NYSE’s discretionary DMM role.
* Attracts significant ETF and tech stock liquidity.
* Some strategies exploit **imbalance flip-flops** seen in NOII feed.

**🔹 2. Alternative Close Mechanisms**

Unlike Europe’s MTF MaC/TAL/3C, in the US there are no formalised “secondary MOC auctions,” but there are **alternative execution venues**:

* **Off-Exchange TRFs / ATSs**: Some brokers cross client flow internally **at the official close price** (benchmark fills, often called "Guaranteed Close" or “At-Close facilitation”).
* **Dark Pools**: Some ATSs peg to the **Primary Closing Price (PCP)**, allowing block crosses immediately after 16:00 at the close.
* **Guaranteed MOC services**: Brokers (e.g., GS, JPM, MS) often offer “Guaranteed Close” where they commit to execute at the official close, absorbing the risk of imbalance impact themselves.

**Nuance:**

* Unlike Europe, **no exchange-run alternative PCP auctions** exist (i.e., no "MaC" equivalent).
* Off-exchange activity is still reported to the tape as executed “at the close,” but primary auction remains the price setter.

**🔹 3. Pros & Cons of US Closing Venues**

| **Venue** | **Pros** | **Cons** |
| --- | --- | --- |
| **NYSE Close** | Deepest liquidity in US cash equities; DMM stabilisation; official benchmark | Less predictable (DMM discretion); later imbalance info (15:55 cut-off); signalling risk |
| **NASDAQ Close** | Fully electronic; transparent NOII; massive ETF/tech liquidity | No discretionary human stabilisation; imbalance flips common |
| **Broker Guaranteed MOC** | Certainty of fill; no need to manage imbalance | Potentially higher spread/fee; broker assumes risk (can be priced in) |
| **Dark Pool PCP Crosses** | Block liquidity; lower signalling | Dependent on contra; not part of official auction |

**🔹 4. Current Trends & New Developments**

1. **Growing concentration of volume at the close**:
   * In the US, ~**7–8% of total daily notional** trades in the closing auctions.
   * Even higher for large-cap stocks and ETFs (often >10%).
   * Mirrors Europe’s ~18% share, but US is less concentrated (still more intraday liquidity).
2. **Rise of Guaranteed Close flow**:
   * More buy-side using brokers’ guaranteed MOC services for operational ease and benchmark alignment.
   * Debate: does this **internalisation** siphon liquidity away from the primary close, worsening imbalances?
3. **Regulatory scrutiny**:
   * SEC monitoring auctions as “critical price formation moments.”
   * Discussions about transparency, DMM discretion at NYSE, and potential for **standardisation** across venues.
4. **Auctions & ETFs**:
   * ETFs heavily rely on the close for NAV alignment.
   * NASDAQ’s transparent cross is particularly popular for ETF managers.
5. **Technology changes**:
   * NYSE experimenting with more electronic tools for DMMs.
   * NASDAQ refining NOII dissemination to reduce “gaming” (e.g., order flip-flops in imbalance feeds).

**🔹 5. Key Nuances vs Europe**

* **US primary closes dominate** → no parallel MTF-style close auctions.
* **NYSE vs NASDAQ model** → DMM discretion (human element) vs electronic cross.
* **Guaranteed Close services** are a uniquely US phenomenon (in Europe, brokers sometimes do this, but MTFs created competing “MaC/TAL” mechanisms instead).
* **Regulatory lens** → US regulators focus on DMM role, imbalance transparency, and broker internalisation; EU regulators focus on fragmentation across MTFs.

✅ In short:

* **If you need official benchmarks → you must go to NYSE/NASDAQ close.**
* **If you want certainty → consider broker Guaranteed Close.**
* **If you want block PCP liquidity → look at ATSs that cross at the close.**
* **Strategically → balance between MOC (guaranteed fill, but potential impact) and conditional/off-exchange (size but no guarantee).**

**1. Explicit trading costs**

| **Venue / Service** | **Execution fee** | **Notes** |
| --- | --- | --- |
| **NYSE Closing Auction** | Exchange fee schedule: ~**0.3–0.5 bps** for auction executions (similar to continuous fees; varies by tier/membership). | Additional **reg + clearing** fees (Section 31, FINRA TAF, NSCC) apply. Brokers may add commission on top. |
| **NASDAQ Closing Cross** | ~**0.3 bps** (standard Nasdaq tape A/B/C rates). | Same as regular execution; auction doesn’t carry a surcharge. |
| **Broker Guaranteed Close** | **No explicit venue fee** to client — broker charges either: (i) a **flat commission** (bps) or (ii) embeds cost in risk transfer spread. | You pay a premium for certainty. Effective cost often **> official auction fees**. |
| **ATS / Dark Pool PCP Cross** | Typically **free or very low (≤0.1 bps)** per side (depends on ATS). | Uses **primary closing price**; execution certainty depends on contra. |

**2. Mechanics & transparency**

| **Venue / Service** | **Price formation** | **Transparency** | **Cut-offs** | **Liquidity depth** |
| --- | --- | --- | --- | --- |
| **NYSE Close** | DMM-run auction; DMM has discretion within bands to stabilise; prints official close | **Imbalance feeds** (every 5s, from 15:50 ET); final cutoff 15:55 | High (largest for NYSE names) |  |
| **NASDAQ Close** | Algorithmic cross maximising executable volume, minimising imbalance | **NOII** imbalance feed every 5s from 15:50–16:00 | Final cutoff 15:50 ET | High (esp. ETFs, tech stocks) |
| **Broker Guaranteed Close** | Broker internalises risk, guarantees execution **at official close price** | **Opaque** — no imbalance data to client; broker manages fill | Often order deadline **before 15:45–15:50 ET** (broker dependent) | Broker capacity-driven; not pooled |
| **ATS / Dark PCP Cross** | Pegged to **Primary Closing Price** | **Dark** — no pre-trade transparency | Orders accepted up to ~16:00 | Thin; opportunistic block fills |

**3. Implicit cost / risk factors**

| **Venue / Service** | **Pros** | **Cons** |
| --- | --- | --- |
| **NYSE Close** | Deepest official liquidity; index/ETF NAV benchmark alignment | DMM discretion (less predictable); visible imbalances → signalling/impact |
| **NASDAQ Close** | Fully electronic; transparent NOII; reliable ETF close | Imbalance “flip-flops”; less human stabilisation than NYSE |
| **Broker Guaranteed Close** | **Certainty of fill** at PCP; operational simplicity | Hidden broker charge; broker may unwind in auction, adding to imbalance |
| **ATS / Dark PCP Cross** | Potential for **block liquidity** at PCP with low footprint | Fill risk (no contra → nothing executes); not part of official auction prints |

**4. Practical “rule-of-thumb” costs on $100m notional**

| **Venue** | **Approx exchange fee (bps)** | **All-in client cost** |
| --- | --- | --- |
| **NYSE auction** | ~0.35 bps | ~$350k (excl. broker commission) |
| **NASDAQ auction** | ~0.3 bps | ~$300k |
| **Guaranteed Close** | Broker-dependent; often 0.5–1.0 bps effective | ~$500k–$1m |
| **ATS PCP cross** | ≤0.1 bps | ≤$100k (if filled) |

**5. New developments to note**

* **Growing share of close flow** (~7–8% US turnover, higher in large caps).
* **Broker “Guaranteed Close”** products gaining traction with passive funds, but regulators watching internalisation.
* **NYSE** exploring more electronic DMM support; **NASDAQ** refining NOII feeds to reduce order “gaming”.
* **ETF reliance** → makes closing mechanisms systemically important.