Top 10 HPLC System Manufacturers in 2026 Compared

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Executive Summary

High-performance liquid chromatography (HPLC) and its higher-pressure successor, ultra-high-performance liquid chromatography (UHPLC), remain the workhorse separation techniques of pharmaceutical, biotechnology, environmental, and food-testing laboratories. As of August 2026, the global HPLC systems market has no single agreed size: **Grand View Research** put it at $4,961.4 million in 2024, growing at a 6% compound annual growth rate (CAGR) to $7,025.4 million by 2030 (Source: www.grandviewresearch.com), while **Fortune Business Insights** values the 2025 market at $5.36 billion rising to $9.13 billion by 2034 (Source: www.fortunebusinessinsights.com); other named research firms' estimates range as high as $7.01 billion by 2031, detailed in the Data Analysis section below. This report compares nine suppliers of analytical HPLC/UHPLC systems—**Waters Corporation**, **Agilent Technologies**, **Thermo Fisher Scientific**, **Shimadzu Corporation**, **PerkinElmer**, **JASCO**, **Hitachi High-Tech**, **KNAUER**, and **O-CP GmbH**—plus **Gilson**, whose VERITY 281 is a semi-preparative/preparative HPLC platform. Bio-Rad and other suppliers of adjacent purification technologies remain relevant market participants but are not included in this analytical-HPLC comparison. Grand View Research separately names Sartorius, PerkinElmer, Bio-Rad, Merck KGaA, Gilson, and Danaher among HPLC-market participants (Source: www.grandviewresearch.com).

Technically, UHPLC systems separate compounds using sub-2-micron particles at pressures that vendor documentation places as high as 1,500 bar (22,000 psi) for **Thermo Fisher's Vanquish Horizon** (Source: www.thermofisher.com, compared with conventional HPLC ceilings around 350 to 400 bar (5,000 to 6,000 psi) as described by Waters (Source: www.waters.com). Trade press coverage places UHPLC backpressures as high as 18,000 psi compared with 6,000 psi for conventional HPLC, with run times roughly one-tenth as long (Source: www.labmanager.com). Every major vendor pairs its hardware with a chromatography data system (CDS): Waters' **Empower**, which the company says is used in roughly 80% of novel drug submissions to the FDA, EMA, and China's NMPA (Source: ir.waters.com); Agilent's **OpenLab CDS**, now at version 3.0 with workstation, client/server, and cloud deployment options (Source: www.agilent.com); Thermo Fisher's **Chromeleon**; and Shimadzu's **LabSolutions**.

No named research firm publishes a fully vendor-by-vendor global HPLC market-share table, but **QYResearch** reports that the top three companies collectively hold about 66% of the global HPLC market, with the European Union and United States each accounting for roughly 34% of demand (Source: www.giiresearch.com). Buyers choosing among these systems in 2026 should weigh pressure and particle-size requirements, detector needs, CDS features that may support a laboratory's validated 21 CFR Part 11 program, on-premises versus cloud deployment, and total cost of ownership rather than defaulting to a single "best" brand; the sections below quantify these differences system by system.

Introduction and Background

High-performance liquid chromatography, commonly abbreviated **HPLC**, is an analytical technique that forces a liquid sample through a column packed with a solid stationary phase under high pressure, separating a mixture's components so they can be identified and quantified. **Ultra-high-performance liquid chromatography (UHPLC)**, sometimes marketed as UPLC, is a newer generation of the same technique that uses smaller stationary-phase particles and substantially higher operating pressures to shorten run times and improve resolution. Both remain central to pharmaceutical quality control, biologics characterization, environmental monitoring, and food-safety testing, and the instruments underpinning them are produced by a relatively concentrated set of global manufacturers.

Market-sizing estimates for the category vary considerably depending on scope and methodology. Grand View Research's narrowly scoped HPLC systems report puts 2024 global revenue at $4,961.4 million, growing at a 6% CAGR from 2025 to 2030 (Source: www.grandviewresearch.com), while IMARC Group's report, listed on marketresearch.com, sizes the market at $5.9 billion in 2024, projected to reach $8.4 billion by 2033 (Source: www.marketresearch.com). QYResearch's figure is notably lower, at $3,529 million in 2024 (Source: www.giiresearch.com), illustrating how differently research firms scope "the HPLC market" (instruments only versus instruments plus consumables and services). This report treats these figures as directional rather than definitive and presents the discrepancies openly in the Data Analysis section below.

This comparison evaluates the manufacturers most consistently named across these reports on four dimensions: instrument capabilities (pressure range, flow rate, detector options), the chromatography data system each vendor pairs with its hardware, adoption and corporate scale, and documented strengths and limitations. It also answers the practical questions buyers raise most often when selecting a system in 2026, including how UHPLC differs from conventional HPLC, which CDS platforms support multi-vendor instrument fleets, and what criteria should drive a purchase decision for a regulated laboratory.

Waters Corporation

Capabilities

Waters, founded when **Jim Waters** built the company's first infrared gas analyzer in 1958 (Source: www.waters.com), sells three current HPLC and UHPLC platform families. The flagship **ACQUITY Premier System** is rated to a maximum operating pressure of 15,000 psi with an operating flow-rate range of 0.001 to 2.000 mL/min (Source: www.waters.com), and it can be fitted with a UV detector, photodiode array (PDA), fluorescence (FLR), charged aerosol (CAD), refractive index (RI), evaporative light-scattering (ELS), or mass-spectrometry detector (Source: www.waters.com). The mid-tier **Alliance iS HPLC System** carries a maximum operating pressure of 10,000 psi up to 5.000 mL/min, over a flow range of 0.001 to 10.000 mL/min (Waters Alliance iS specification sheet. The entry and mid-level **Arc HPLC System** has a documented maximum pressure limit of 9,500 psi (Source: support.waters.com) and offers nine detector options, including a photodiode array detector and the ACQUITY QDa mass detector (Source: www.waters.com. All three systems are designed to run under Waters' **Empower** chromatography data system, which the company describes as scalable from a single workstation to an enterprise-wide network with on-premises or cloud deployment (Source: help.waters.com) and which maintains a project-level audit trail that keeps track of activities such as method creation and data acquisition (Source: help.waters.com).

Adoption

Waters Corporation was organized as a Delaware corporation in 1991 (Source: www.sec.gov) and introduced the ACQUITY UPLC System, the technology underpinning its modern UHPLC line, in 2004 (Source: www.sec.gov). The company is headquartered in Milford, Massachusetts, and reports approximately 16,000 employees worldwide (Source: ir.waters.com). Waters reported fiscal-year 2025 sales of $3,165 million that grew 7% as reported (Source: ir.waters.com), and the company states that approximately 80% of novel drugs submitted to the FDA, EMA, and China's NMPA use Empower (Source: ir.waters.com), a vendor claim rather than an independently audited ranking.

Strengths and Limitations

Waters' documented strength is breadth of detector options paired with Empower's reported prevalence in regulatory filings, which matters for laboratories whose methods must transfer smoothly between sites and contract partners already standardized on the same CDS. A neutral limitation is that Waters' mid-tier and entry systems (10,000 psi and 9,500 psi respectively) sit below the pressure ceilings some competitors report for their comparable UHPLC-class instruments, meaning laboratories requiring the very highest linear velocities may need to specify the ACQUITY Premier tier specifically rather than a lower-tier Waters system.

Agilent Technologies

Capabilities

Agilent, created in 1999 as a spin-off of Hewlett-Packard's test-and-measurement and chemical-analysis instrument businesses (Source: www.eetimes.com), released its next-generation **InfinityLab LC Series** in October 2024, comprising the 1290 Infinity III LC, 1260 Infinity III Prime LC, and 1260 Infinity III LC systems (Source: www.agilent.com). Its application-specific **1290 Infinity III High-Throughput UHPLC System** operates up to 1,300 bar (Source: www.agilent.com), roughly equivalent to 18,850 psi. Agilent's CDS, **OpenLab CDS**, is currently at software version 3.0 and can be deployed as a standalone workstation, "workstation plus," client/server network, or virtualized environment, and it can control non-Agilent liquid chromatography, gas chromatography, and ion chromatography instruments in addition to Agilent's own hardware (Source: www.agilent.com). OpenLab CDS records every operator entry or action that creates, modifies, or deletes an electronic record in secure, time-stamped audit trails (Source: www.agilent.com), and Agilent supports deploying OpenLab CDS and its ECM XT document-management module on Amazon Web Services and Microsoft Azure (Source: www.agilent.com), while noting that protection of laboratory data and applications remains the responsibility of the lab's own IT function under a shared-responsibility model (Source: www.agilent.com).

Adoption

Agilent is headquartered in Santa Clara, California, with principal executive offices at 5301 Stevens Creek Boulevard (Source: www.sec.gov), and it reported approximately 18,000 employees worldwide and $6.95 billion in company-wide revenue for fiscal 2025, according to its own corporate fact sheet (Agilent fact sheet. That revenue figure spans Agilent's entire instrumentation and services portfolio, not the LC/HPLC product line alone.

Strengths and Limitations

Agilent's OpenLab CDS explicitly supports third-party instrument control and multiple deployment topologies, which the company frames as useful for laboratories that need to standardize software across a mixed instrument fleet rather than a single-vendor bench. Agilent itself describes audit-trail review as "typically a time-consuming, detail-oriented chore" that its CDS is built to streamline (Source: www.agilent.com, an acknowledgment that Part 11 compliance workflows carry real operational overhead regardless of vendor. A neutral limitation for buyers is that, as with any large multi-product supplier, Agilent's HPLC-specific figures (revenue, headcount) are not broken out separately from its broader life-sciences and diagnostics business in public disclosures.

Thermo Fisher Scientific

Capabilities

Thermo Fisher's **Vanquish Horizon UHPLC System** is rated for maximum operating pressures of up to 1,500 bar, or 22,000 psi (Source: www.thermofisher.com, among the highest pressure ceilings documented for the analytical UHPLC systems reviewed in this report. The company's **Vanquish Neo** system, aimed at nano-, capillary-, and micro-flow liquid chromatography paired with mass spectrometry, uses ProFlow XR pump technology rated for robust operation up to 1,500 bar across a flow range of 1 nanoliter per minute to 100 microliters per minute (Vanquish Neo specification sheet. The Vanquish line integrates with Thermo Fisher's **Chromeleon Chromatography Data System (CDS)** and its built-in compliance tools (Source: www.thermofisher.com; Thermo Fisher states that Chromeleon 7.3.2 provides tools to maintain data integrity and meet 21 CFR Part 11 electronic-signature requirements (Source: www.thermofisher.com), including an up-to three-stage sequence-level electronic-signature approval process (Source: www.thermofisher.com). Thermo Fisher's HPLC/UHPLC detector portfolio spans UV-Vis absorption, fluorescence, and refractive-index optical detectors (Source: www.thermofisher.com), and the company states its fluorescence detectors can be 10 to 1,000 times more sensitive than UV detectors for compounds containing fluorophores (Source: www.thermofisher.com).

Adoption

Thermo Fisher Scientific's principal executive offices are in Waltham, Massachusetts 02451, per its fiscal-year 2025 Form 10-K filed with the SEC (Source: www.sec.gov). The company's investor-relations overview states annual revenue over $45 billion (Source: ir.thermofisher.com), while its SEC-filed FY2025 annual report states total revenue of $44.56 billion (Thermo Fisher FY2025 annual report, a minor rounding discrepancy between marketing copy and the audited figure that this report notes for transparency.

Strengths and Limitations

Thermo Fisher's documented pressure ceiling (1,500 bar/22,000 psi on Vanquish Horizon) is the highest among the flagship analytical UHPLC systems reviewed here, which the company positions as enabling the shortest possible run times on sub-2-micron columns. As with Agilent and Waters, Thermo Fisher's chromatography business sits inside a much larger diversified life-sciences and laboratory-equipment portfolio, so buyers evaluating the company specifically as an HPLC vendor should look at product-line documentation (Vanquish, Chromeleon) rather than corporate-wide revenue figures.

Shimadzu Corporation

Capabilities

Shimadzu's **Nexera** series spans four pressure tiers, from conventional HPLC configurations rated at 44 MPa (approximately 440 bar) with particle sizes above 3 micrometers (Source: www.ssi.shimadzu.com) up to the flagship **Nexera X3** UHPLC configuration rated to 130 MPa. Within that lineup, the Shimadzu **LC-40D** pump module operates from 0.1 microliters per minute to 10 milliliters per minute with an accuracy of plus or minus 1 percent (Source: www.ssi.shimadzu.com). Shimadzu markets the Nexera 40 Series as the smallest footprint systems in its class (Source: www.ssi.shimadzu.com), a vendor claim about physical size rather than an independently verified benchmark. Shimadzu's CDS, **LabSolutions**, provides authentication, audit trails, electronic signatures, and data management (Source: www.ssi.shimadzu.com). Shimadzu documents these as features for regulated workflows, but the laboratory remains responsible for determining whether its validated system and procedures meet applicable 21 CFR Part 11 and predicate-rule requirements (Source: www.shimadzu.com). The company also offers installation-qualification and operational-qualification (IQ/OQ) documentation and validation support for regulated laboratories (Source: www.shimadzu.com). LabSolutions is offered in three platform tiers, including a networked "CS" database configuration for multi-computer laboratories that maintains a single unified audit trail across the connected environment (Source: www.ssi.shimadzu.com).

Adoption

Shimadzu Corporation was established in March 1875 and is headquartered in Kyoto, Japan (Source: www.shimadzu.com). As of March 31, 2026, the Shimadzu Group reported 14,649 employees globally (Source: www.shimadzu.com).

Strengths and Limitations

Shimadzu's four-tier pressure ladder, from 44 MPa conventional HPLC up to 130 MPa UHPLC, gives laboratories a way to match instrument cost and capability to workload rather than over-specifying every bench. A neutral, quantified limitation is that Shimadzu's flagship UHPLC pressure ceiling of 130 MPa (approximately 18,850 psi) sits below Thermo Fisher's 1,500 bar (22,000 psi) Vanquish Horizon, a difference buyers running the most pressure-demanding sub-2-micron methods should factor into method-transfer planning.

PerkinElmer

PerkinElmer, now a Revvity brand, introduced its current **LC 300** HPLC/UHPLC platform together with **SimplicityChrom** CDS software in 2020 (Source: ir.revvity.com). The LC 300 platform offers pump options rated at 6,000, 10,000, and 18,000 psi (Source: shop.perkinelmer.com), and PerkinElmer markets Analytical HPLC, HPLC, and UHPLC configurations under the same LC 300 family, letting a laboratory scale pressure and throughput without switching platforms (Source: www.perkinelmer.com). Revvity, PerkinElmer's parent company, reported full-year 2024 GAAP revenue of $2,755 million (Source: ir.revvity.com), compared with the approximately $2.9 billion PerkinElmer reported for 2019 at the time of the LC 300 launch (Source: ir.revvity.com). The companies' portfolios are not directly comparable because Revvity spun off PerkinElmer's former Applied, Food and Enterprise Services businesses into a separately traded company in 2023.

JASCO

JASCO's integrated **LC-4000 Series** is offered across three pressure platforms of 50 MPa, 70 MPa, and 130 MPa, corresponding respectively to conventional HPLC, rapid HPLC, and sub-2-micron UHPLC separations (Source: www.jasco-global.com). Its LC-4000 UHPLC configuration is rated to 130 MPa (Source: www.jasco-global.com). JASCO also sells preparative HPLC systems for compound isolation, with flow rates from up to 20 mL/min on 21.2 millimeter internal-diameter columns to much higher flows on larger-diameter preparative columns, controlled through its ChromNAV-FC fraction-control software (Source: jascoinc.com). JASCO Corporation was established on April 1, 1958, and is headquartered in Hachioji, Tokyo (Source: www.jasco-global.com), and the company traces its HPLC product lineage back to the start of commercial HPLC in the early 1970s (Source: www.jasco-global.com).

Hitachi High-Tech

Hitachi High-Tech's current analytical platform, **Chromaster PLUS**, offers pump modules rated up to 40 MPa (model 5110) or 60 MPa (model 5160) (Source: www.hitachi-hightech.com), with the higher-pressure 5160 module operating across a flow-rate range of 0.001 to 5.000 mL/min (Source: www.hitachi-hightech.com). Hitachi High-Tech Corporation was established on April 12, 1947 (Source: www.hitachi-hightech.com) and reported group revenues of 821.7 billion yen for the fiscal year ended March 2026 (Source: www.hitachi-hightech.com).

KNAUER

KNAUER's high-end analytical UHPLC line, the **AZURA 1240 bar System**, is rated to 1,240 bar (Source: www.knauer.net) and is compatible with multiple third-party chromatography data systems rather than a single proprietary CDS, which the company frames as "you name it, we have it" flexibility for laboratories standardized on ClarityChrom, Chromeleon, or OpenLab (Source: www.knauer.net). KNAUER was founded in Berlin on October 1, 1962, by chemist Herbert Knauer and his wife Roswitha (Source: www.knauer.net), and the company states it was the first European manufacturer to produce HPLC devices in modular design (Source: www.knauer.net). KNAUER remains a family-owned business with about 190 employees (Source: www.knauer.net), making it the smallest company by headcount among the manufacturers profiled in this report and a useful illustration that HPLC hardware is not exclusively the domain of multi-billion-dollar diversified conglomerates.

O-CP GmbH

O-CP GmbH (ORGANIC-CONSULT PFEIFFER GmbH) designs customized HPLC systems for laboratory, pilot-plant, and production applications. Its analytical HPLC offering includes pumps specified from 0.001 to 10 mL/min at up to 400 bar; the company also offers semi-preparative and preparative systems. O-CP describes its systems as configurable to customer requirements, so a single flagship model, fixed detector menu, and universal native CDS cannot be compared directly with the standardized analytical-UHPLC platforms above (O-CP HPLC Systems overview; O-CP HPLC Devices overview.

Gilson

Gilson's **VERITY 281 HPLC System** is a semi-preparative and preparative purification platform. Gilson states that configurations can use high-pressure gradient pumps with flow rates up to 200 mL/min and pressures up to 600 bar (8,700 psi); the system is controlled by **TRILUTION LC** software (VERITY 281 HPLC System. This makes Gilson a relevant tenth manufacturer for laboratories whose HPLC requirement is compound isolation and purification rather than routine analytical assay work.

Adjacent Purification Supplier: Bio-Rad Laboratories

Bio-Rad's liquid chromatography portfolio centers on its **NGC Medium-Pressure Chromatography Systems**, controlled by ChromLab Software, which the company describes as providing system control, automated methods, and analysis options (Source: www.bio-rad.com). Unlike the small-molecule analytical HPLC systems described above, the NGC line is built primarily for biomolecule and protein purification workflows rather than pharmacopeial small-molecule assay work. Bio-Rad is headquartered in Hercules, California, and reported full-year 2024 net sales of $2,566.5 million (Source: investors.bio-rad.com), with its Life Science segment contributing $1,028.1 million of that total per its SEC filing (Source: www.sec.gov).

Additional Market Participants

Grand View Research's competitive-landscape data for the HPLC market also names Sartorius, PerkinElmer, Bio-Rad, Merck KGaA, Gilson, and Danaher among global participants (Source: www.grandviewresearch.com), reflecting a market where bioprocessing-focused suppliers and diversified life-sciences holding companies compete alongside the dedicated analytical-instrument makers profiled above.

Chromatography Data System (CDS) Software Comparison

Every HPLC or UHPLC hardware purchase is paired with a chromatography data system, the software that controls the instrument, acquires and stores chromatographic data, and manages the electronic-records and electronic-signature workflows regulated laboratories need. The **U.S. Food and Drug Administration's** Part 11 guidance states that the regulation applies to records in electronic form that are created, modified, maintained, archived, retrieved, or transmitted under agency recordkeeping requirements (Source: www.fda.gov), which is why every major CDS vendor documents its audit-trail and electronic-signature capabilities explicitly. FDA guidance also states the agency does not intend to enforce certain Part 11 provisions, including specific validation, audit-trail, and record-retention requirements, while the underlying predicate recordkeeping rules continue to apply (Source: www.fda.gov), a nuance that shapes how CDS vendors position their compliance features.

Among the platforms compared in this report, **Waters Empower** is scalable from a single workstation to an enterprise-wide network with either on-premises or cloud deployment (Source: help.waters.com) and offers a "Full Audit Trail Support" administrative policy so that, with this policy enabled, anytime someone creates a new project it automatically receives a project audit trail (Source: help.waters.com). **Agilent OpenLab CDS** supports four deployment topologies (workstation, workstation plus, client/server, and virtualization) and explicit control of non-Agilent LC, GC, and IC instruments (Source: www.agilent.com). **Thermo Fisher Chromeleon** scales from a single laboratory to global, multi-site, cloud-based deployment (Source: www.thermofisher.com) and provides data security and audit-trail documentation built on a relational database to support simplified reviews (Source: www.thermofisher.com), while also supporting third-party systems including capillary electrophoresis instruments under the same GMP compliance framework (Source: www.thermofisher.com). **Shimadzu LabSolutions CS** maintains a single unified audit trail across a networked laboratory (Source: www.ssi.shimadzu.com) and offers a mid-tier "DB" (single-computer database) configuration for laboratories not yet ready for a fully networked deployment (Source: www.ssi.shimadzu.com. Laboratories running instruments from multiple vendors also have vendor-neutral options: **ACD/Labs' Spectrus Processor** is described by its maker as a multi-technique, vendor-neutral application for getting answers from analytical data "regardless of the instrument" that generated it (Source: www.acdlabs.com).

CDS deployment economics are shifting toward the cloud but remain predominantly on-premises today. Mordor Intelligence estimates that on-premises solutions accounted for 62.02% of the chromatography data systems market in 2025, while cloud deployments are expanding at a 12.03% CAGR (Source: www.mordorintelligence.com) (Source: www.mordorintelligence.com), a growth rate that outpaces the underlying hardware market and suggests laboratories are increasingly evaluating CDS platforms on cloud readiness rather than purely on-premises capability.

Feature Comparison

Table 1 below summarizes the representative system, maximum documented operating pressure, chromatography software, and headquarters location for each of the ten manufacturers compared in this report.

MANUFACTURER	REPRESENTATIVE HPLC SYSTEM/USE CASE	MAXIMUM DOCUMENTED PRESSURE	NATIVE CDS SOFTWARE	HEADQUARTERS
Waters	ACQUITY Premier System	15,000 psi (Source: www.waters.com)	Empower	Milford, Massachusetts, USA
Agilent Technologies	1290 Infinity III High-Throughput UHPLC	1,300 bar (approximately 18,850 psi) (Source: www.agilent.com)	OpenLab CDS	Santa Clara, California, USA
Thermo Fisher Scientific	Vanquish Horizon UHPLC	1,500 bar (22,000 psi) (Source: www.thermofisher.com	Chromeleon CDS	Waltham, Massachusetts, USA
Shimadzu	Nexera X3	130 MPa (approximately 18,850 psi)	LabSolutions	Kyoto, Japan
PerkinElmer	LC 300 (UHPLC configuration)	18,000 psi (Source: shop.perkinelmer.com)	SimplicityChrom	Shelton, Connecticut, USA
JASCO	LC-4000 UHPLC	130 MPa (approximately 18,850 psi) (Source: www.jasco-global.com)	ChromNAV	Hachioji, Tokyo, Japan
Gilson	VERITY 281 HPLC System (semi-preparative/preparative purification)	Up to 600 bar (8,700 psi) (VERITY 281 HPLC System	TRILUTION LC	Middleton, Wisconsin, USA
Hitachi High-Tech	Chromaster PLUS 5160	60 MPa (Source: www.hitachi-hightech.com)	LaChrom/EZChrom	Minato-ku, Tokyo, Japan
KNAUER	AZURA 1240 bar System	1,240 bar (Source: www.knauer.net)	Multi-vendor compatible (ClarityChrom, Chromeleon, OpenLab)	Berlin, Germany
Bio-Rad Laboratories	NGC Medium-Pressure Chromatography Systems (biomolecule purification, not analytical HPLC)	Not disclosed in psi/bar for this application-specific class	ChromLab Software (Source: www.bio-rad.com)	Hercules, California, USA

The comparison shows that documented UHPLC pressure ceilings cluster tightly between roughly 1,240 and 1,500 bar for the highest-end analytical systems, with Thermo Fisher's Vanquish Horizon at the top of the range and KNAUER's AZURA 1240 the nearest competitor among the manufacturers reviewed. CDS strategy diverges more sharply: Waters, Thermo Fisher, and Shimadzu each promote a proprietary flagship platform tightly integrated with their own hardware, while Agilent's OpenLab CDS and KNAUER's multi-vendor compatibility explicitly target laboratories running mixed instrument fleets. The table compares nine analytical-HPLC suppliers, including O-CP, plus Gilson's preparative HPLC use case; Gilson's pressure and flow specification should therefore not be interpreted as a like-for-like benchmark for routine analytical UHPLC. Bio-Rad remains an adjacent purification supplier and is discussed separately above.

Performance and Benchmarks: HPLC versus UHPLC

Table 2 below contrasts the technical operating envelopes of conventional HPLC and UHPLC, the distinction underlying the "uhplc vs hplc systems" comparison buyers most frequently search for.

PARAMETER	CONVENTIONAL HPLC	UHPLC
Typical maximum pressure	Approximately 350 to 400 bar (5,000 to 6,000 psi) (Source: www.waters.com); Phenomenex describes HPLC as "moderate pressure (up to 6000 psi)" (Source: www.phenomenex.com	Up to approximately 1,240 to 1,500 bar (18,000 to 22,000 psi) across the flagship systems compared in this report; Phenomenex describes UHPLC as "high pressure (up to 15,000 psi)" (Source: www.phenomenex.com
Stationary-phase particle size	Typically 3 to 5 micrometers, described by Phenomenex as "larger particles in the stationary phase" (Source: www.phenomenex.com)	Below 2 micrometers, described by Phenomenex as "smaller particles in the stationary phase" (Source: www.phenomenex.com)
Typical routine assay run time	Baseline (commonly around 30 minutes for routine assays)	Shortened to under 5 minutes for the same class of routine assay, per Mordor Intelligence citing a 2025 survey (Source: www.mordorintelligence.com)
Typical instrument cost	Roughly $50,000 for a conventional unit	Roughly $150,000, per Mordor Intelligence (Source: www.mordorintelligence.com)

Waters' own educational materials illustrate why the pressure gap is so large: reducing particle size from 5.0 to 1.7 micrometers, roughly a threefold decrease, is predicted by chromatographic theory to raise backpressure by a factor of more than 20, and Waters reports observing a comparable increase in practice when testing the change (Source: www.waters.com). Trade publication Lab Manager similarly describes UHPLC as running at backpressures up to 18,000 psi compared with 6,000 psi for conventional HPLC, with run times roughly one-tenth as long (Source: www.labmanager.com). These figures are broadly consistent across vendor, market-research, and trade-press sources, even though the exact pressure and cost numbers vary somewhat by source and by which specific instrument tier is being described.

Beyond raw speed, the pressure and particle-size gains matter most where separation demand is growing fastest: Mordor Intelligence reports that instruments accounted for 48.25% of HPLC market revenue in 2025 while consumables, including the specialized columns needed for UHPLC separations, are expanding at an 8.26% CAGR, and attributes part of that growth to biologics, noting that eighteen monoclonal antibodies won FDA approval in 2024 and sustained a pipeline that depends on multi-column purification trains (Source: www.mordorintelligence.com).

Data Analysis and Evidence

Table 3 below compares global HPLC market-size and growth estimates from six named research firms, illustrating how much these figures diverge depending on scope, base year, and methodology.

RESEARCH FIRM	BASE YEAR VALUE	FORECAST VALUE	CAGR
Grand View Research	$4,961.4 million (2024) (Source: www.grandviewresearch.com)	$7,025.4 million (2030)	6% (2025-2030) (Source: www.grandviewresearch.com)
Fortune Business Insights	$5.36 billion (2025) (Source: www.fortunebusinessinsights.com)	$9.13 billion (2034)	6.10% (Source: www.fortunebusinessinsights.com)
Mordor Intelligence	$5.44 billion (2025) (Source: www.mordorintelligence.com)	$7.01 billion (2031)	4.49%
IMARC Group	$5.9 billion (2024) (Source: www.marketresearch.com)	$8.4 billion (2033)	3.9%
QYResearch	$3,529 million (2024) (Source: www.giiresearch.com)	$4,416 million (2031)	3.3%
MarketsandMarkets	$4.5 billion (2020) (Source: www.marketsandmarkets.com)	$5.7 billion (2025)	4.6%

No two firms agree on the market's exact size, and the spread (from QYResearch's $3.5 billion 2024 estimate to IMARC's $5.9 billion for the same year) reflects differing decisions about whether to include consumables, service revenue, and adjacent chromatography formats within "HPLC." Regional breakdowns show a similar pattern of rough but not exact agreement: Fortune Business Insights attributes 39% of the global HPLC market to North America (Source: www.fortunebusinessinsights.com), while Mordor Intelligence puts North America's 2025 share at 37.66%, with Asia-Pacific the fastest-growing region at a 6.72% CAGR (Source: www.mordorintelligence.com). Grand View Research's separate country-level model projects the U.S. HPLC market to grow from $1,370.4 million in 2024 (Source: www.grandviewresearch.com) to $1,898.5 million by 2030, and its North America model separately projects $1,571.7 million in 2024 (Source: www.grandviewresearch.com) growing at a 5.6% CAGR through 2030 (Source: www.grandviewresearch.com).

On vendor concentration, QYResearch reports that the European Union is the largest single national/regional HPLC market with about 34% share, with the United States close behind, and separately reports that the top three companies in the global HPLC market occupy about 66% combined market share (Source: www.giiresearch.com, consistent with the concentrated set of large diversified instrument makers profiled in this report. The adjacent chromatography-columns market, tracked separately by MarketsandMarkets, was valued at US$2.58 billion in 2024 (Source: www.marketsandmarkets.com) with a 7.3% CAGR through 2031 (Source: www.marketsandmarkets.com), and North America held a 44.4% revenue share of that market in 2025 (Source: www.marketsandmarkets.com). The broader chromatography instruments category, which includes gas chromatography alongside HPLC, was sized by Grand View Research at $9,822.6 million in 2023, growing to $13,801.3 million by 2030 (Source: www.grandviewresearch.com).

Implications and Future Directions

Three factors may shape how laboratories select HPLC and UHPLC systems through the rest of this decade. First, Mordor Intelligence estimates that cloud CDS deployments are expanding at a 12.03% CAGR; buyers should treat that as a publisher estimate and assess each vendor's current deployment and data-management capabilities. Second, biologics manufacturing and purification remain an important adjacent use case for preparative chromatography systems; FDA's 2024 report records 18 biosimilar approvals for eight reference products, not 18 monoclonal-antibody approvals (FDA's 2024 New Drug Therapy Approvals report. Third, the publisher's approximately threefold conventional-HPLC-to-UHPLC cost comparison is an illustrative estimate, not a broadly applicable quoted-price benchmark; laboratories should obtain configuration-specific quotations and evaluate total cost of ownership.

Selecting among the manufacturers compared in this report requires weighing several criteria rather than any single specification:

- **Required pressure and particle-size range**: laboratories running legacy methods on 3 to 5 micrometer columns do not need a 1,500 bar system, while method-development labs pushing sub-2-micron separations should specify the highest documented pressure ceiling available,

such as Thermo Fisher's Vanquish Horizon or KNAUER's AZURA 1240.

- **Detector requirements**: laboratories needing charged-aerosol or evaporative light-scattering detection for non-chromophoric compounds should confirm the specific detector is offered on the exact system tier under consideration, since detector options often differ between a vendor's entry, mid, and flagship platforms.
- **CDS compliance features**: 21 CFR Part 11 electronic-records and electronic-signature support, audit-trail granularity, and multi-stage electronic-signature approval workflows vary in implementation detail across Empower, OpenLab CDS, Chromeleon, and LabSolutions, even though all four vendors document Part 11-oriented capabilities.
- **Deployment model**: buyers should confirm whether their preferred CDS supports the specific cloud provider, on-premises client/server, or single-workstation topology their IT policy requires, since cloud deployment maturity differs by vendor.
- **Multi-vendor instrument fleets**: laboratories operating instruments from more than one manufacturer should weight CDS platforms, such as OpenLab CDS or KNAUER-compatible third-party software, that explicitly document non-native instrument control.
- **Total cost of ownership**: instrument list price is only one input; consumables (columns, detector lamps, seals) and CDS licensing and validation costs accumulate over a system's operating life.

Chromatography data increasingly functions as one input into a laboratory's broader quality and enterprise data infrastructure rather than a standalone record store, since audit-trail exports, method libraries, and instrument qualification records must ultimately reconcile with quality management systems, laboratory information management systems (LIMS), and, in regulated commercial and clinical operations, enterprise platforms used well beyond the bench. Life-sciences-focused technology consultancies observe this integration challenge directly: intuitionlabs.ai, a life-sciences and artificial-intelligence (AI) consultancy that does not manufacture laboratory instruments, describes its own data-engineering practice as delivering "robust data pipelines, integration, warehousing, and business intelligence for actionable insights" (Source: intuitionlabs.ai) for pharmaceutical and life-science organizations, and states that its teams "understand the unique regulatory landscape, data complexities, and business drivers of the life sciences sector" (Source: intuitionlabs.ai). For laboratories weighing CDS platform choices against downstream data-integration requirements, that kind of independent, vendor-agnostic advisory perspective can complement rather than replace the instrument and software vendors' own documentation.

Frequently Asked Questions (FAQs)

What is the difference between HPLC and UHPLC? UHPLC uses smaller stationary-phase particles, typically below 2 micrometers versus 3 to 5 micrometers for conventional HPLC, at substantially higher operating pressures, commonly up to 1,240 to 1,500 bar (18,000 to 22,000 psi) on flagship systems compared with roughly 350 to 400 bar (5,000 to 6,000 psi) for conventional HPLC (Source: www.waters.com). The result is shorter run times, with trade press describing UHPLC run times as roughly one-tenth as long as conventional HPLC (Source: www.labmanager.com), at a higher instrument acquisition cost.

Which company has the largest share of the HPLC market? No named research firm publishes an audited, vendor-by-vendor global share breakdown, but QYResearch reports that the top three companies collectively hold about 66% of the global HPLC market (Source: www.giiresearch.com), a concentration consistent with Waters, Agilent, Thermo Fisher, and Shimadzu being the manufacturers most consistently named across the market reports reviewed in this article.

Waters, Agilent, or Shimadzu: how do their flagship systems compare? On documented maximum pressure, Waters' ACQUITY Premier reaches 15,000 psi (Source: www.waters.com), Agilent's 1290 Infinity III High-Throughput UHPLC reaches roughly 18,850 psi at 1,300 bar (Source: www.agilent.com), and Shimadzu's Nexera X3 reaches 130 MPa, also roughly 18,850 psi. Each pairs its hardware with a proprietary CDS (Empower, OpenLab CDS, and LabSolutions respectively) that documents 21 CFR Part 11 electronic-records support, so the practical choice for most regulated laboratories turns on existing software standardization, detector requirements, and vendor service coverage rather than pressure specification alone.

What is the best HPLC system in 2026? There is no single system that is objectively "best" across all applications; the right choice depends on required pressure and particle size, detector needs, CDS compliance and deployment requirements, and budget, as detailed in the "Implications and Future Directions" section above.

Which chromatography data system software works with instruments from multiple manufacturers? Agilent's OpenLab CDS explicitly documents control of non-Agilent LC, GC, and IC instruments (Source: www.agilent.com), KNAUER's AZURA systems are built to run under multiple third-party CDS platforms including Chromeleon and OpenLab (Source: www.knauer.net), and ACD/Labs' Spectrus Processor is marketed as a vendor-neutral platform for processing data regardless of the originating instrument (Source: www.acdlabs.com).

How should a laboratory choose an HPLC system? Match pressure and particle-size capability to the methods actually being run, confirm the required detector is available on the specific system tier, verify the paired CDS meets the laboratory's 21 CFR Part 11 and deployment requirements, and evaluate total cost of ownership across instrument, consumables, and software licensing rather than list price alone, as detailed above.

Conclusion

The HPLC and UHPLC systems market in 2026 remains dominated by a small group of long-established instrument makers, chiefly Waters, Agilent, Thermo Fisher Scientific, and Shimadzu, alongside mid-market and specialist instrument makers or system suppliers including PerkinElmer, JASCO, Hitachi High-Tech, KNAUER, O-CP, and Gilson. This comparison profiles nine analytical-HPLC suppliers—O-CP included—plus Gilson for preparative HPLC capability rather than as a like-for-like analytical UHPLC supplier. Major vendors pair their hardware with CDS platforms that offer electronic-record, electronic-signature, and audit-trail features; the laboratory must validate its specific system and procedures against applicable 21 CFR Part 11 and predicate-rule requirements. Implementation, deployment flexibility, and multi-vendor instrument support differ meaningfully across Empower, OpenLab CDS, Chromeleon, and LabSolutions. Market-size estimates for the category diverge by nearly two-to-one across research firms, from roughly $3.5 billion to $5.9 billion depending on scope, underscoring that buyers should treat any single market-size figure as directional context rather than a precise benchmark.

For laboratories evaluating a purchase, the practical differentiators are not marketing claims about being "the best" but quantifiable specifications: maximum pressure and compatible particle size, the specific detector types offered on a given system tier, the CDS platform's documented compliance and deployment features, and total cost of ownership across a roughly $50,000 to $150,000 range depending on whether conventional HPLC or UHPLC capability is required. Cloud-based CDS deployment and evolving laboratory data-management needs may continue to shape vendor roadmaps over the next several years, making it worth revisiting vendor-specific documentation periodically rather than treating any comparison, including this one, as a permanently fixed ranking.

Tags: hplc, uhplc, hplc system manufacturers, waters empower, agilent openlab cds, thermo fisher vanquish, shimadzu labsolutions, chromatography data system, hplc vs uhplc, hplc market size

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Contact founder Adrien Laurent and team at intuitionlabs.ai/contact for a consultation.

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