

Multiplate Autosampler

SIL-30ACMP



Multiplate Autosampler Ideal as a Front-End LC to an MS

Nexera

SIL-30ACMP

Multiplate Autosampler



To speed up R&D in such areas as pharmacokinetics (drug manufacturing), it has become increasingly necessary to analyze large numbers of samples at high speed and high precision. In response to these demands, the new multiplate-compatible SIL-30ACMP autosampler has been added to the Nexera UHPLC series.

The SIL-30ACMP achieves an ultrafast injection performance exceeding that of current models while maintaining ultralow carryover performance. In addition, up to 6 microtiter plates can be loaded, enabling a maximum of 2304 samples to be analyzed continuously. By incorporating these various functions, the SIL-30ACMP Autosampler is ideally suited as a front-end LC for LC/MS and LC/MS/MS systems.

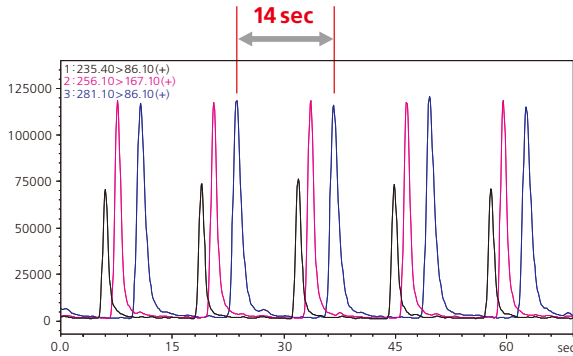
- High-speed injection significantly improves throughput in multi-sample processing
- Ultralow (near-zero) carryover
- Outstanding injection mechanism assures precision when injecting small volumes
- Open access design enables the loading of samples, even during analysis



more Speed High-speed injection significantly improves throughput in multi-sample processing

High-speed injection of 7 seconds enables ultrafast LC/MS/MS analysis

Achieve ultrafast LC/MS/MS analysis by combining the SIL-30ACMP, featuring the fastest injection operating time of just 7 seconds and an analysis cycle of 14 seconds, with the ultrafast positive/negative ionization switching (15 msec) and high-speed scanning (15,000 u/sec) of the Shimadzu LCMS-8030 Triple Quadrupole Mass Spectrometer.

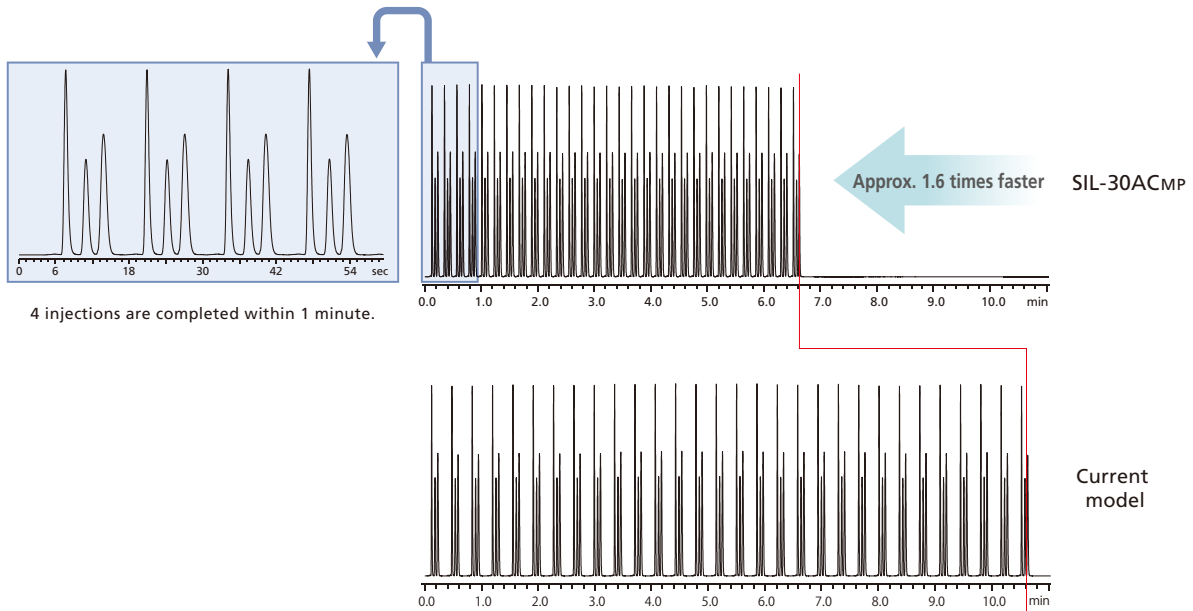


Event #	Compound	Q1 m/z	Q3 m/z
1	Lidocaine	235.4	86.1
2	Diphenhydramine	256.1	167.1
3	Imipramine	281.1	86.1

Column: Shim-pack XR-ODS II (30 mmL. × 1.5 mmL.D., 2.2µm)
Mobile phase: 25% acetonitrile aqueous solution containing 0.1 % formic acid
Flow rate: 1.2 mL/min
Ionization mode: ESI(+)

Improved overall analysis throughput

Even on current models, use of the SIL-30ACMP speeds up analysis. The following example shows that the analysis time can be shortened by at least 2 hours when an injection is performed 1000 times using the SIL-30ACMP.

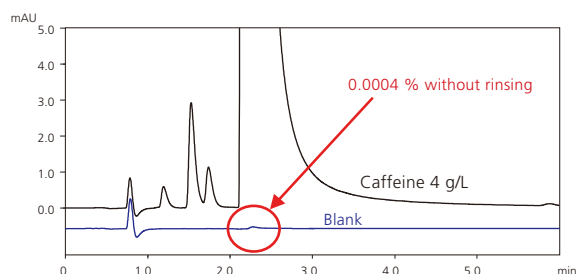


Comparison When Up to 30 Injections Are Performed

near ZERO Carryover Ultralow (near-zero) carryover

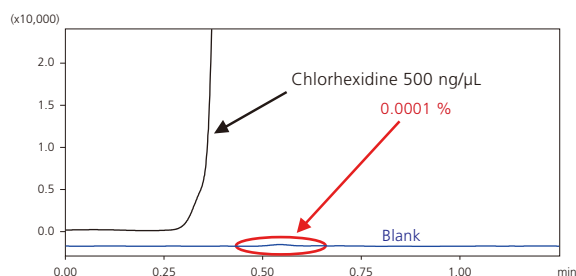
Ultralow carryover achieved without rinsing

When rinsing is performed to keep carryover low, the total analysis time sometimes increases as the number of analyses increases. Nexera autosamplers excel in suppressing carryover even without rinsing.



Ultralow carryover even on a high-sensitivity LC/MS/MS

Ultralow carryover performance is required with LC/MS systems. The SIL-30ACMP demonstrates exceptional carryover performance even on compounds such as chlorhexidine that are very prone to adsorption. Moreover, the SIL-30ACMP features an improved rinsing mechanism to achieve even lower carryover.

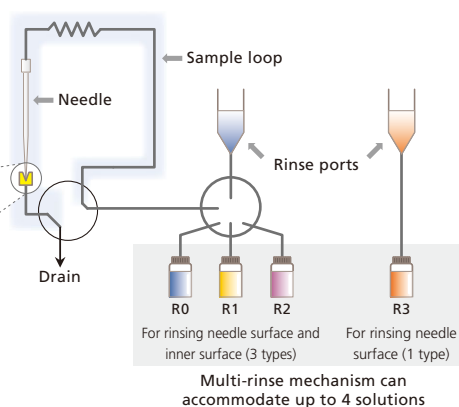
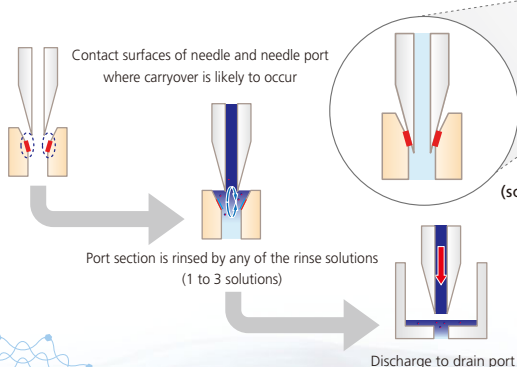


Improvements in high-sensitivity analysis and quantitative precision achieved by ultralow carryover

In the batch analysis of multiple components, components with greatly differing polarities are frequently analyzed together. In cases such as this, sufficient rinsing may not be achieved using one type of rinse solution. To combat this, the SIL-30ACMP has not only been designed with a hardware structure to which components are less likely to adsorb, but also has a modified rinse mechanism designed to achieve even lower carryover.

Multi-rinse mechanism supporting up to 4 solutions

The needle surface can be rinsed by a maximum of two rinse solutions and the needle inner surface can be rinsed by a maximum of three rinse solutions. Of course, rinsing with just one solution in the usual way is also possible. The rinsing order can be set as desired.



Needle port rinsing mechanism

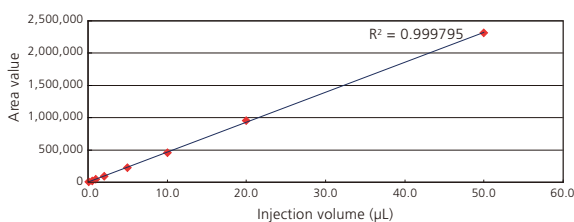
The needle port is one of the places on an autosampler where carryover is likely to occur. On the SIL-30ACMP, the needle port is rinsed automatically.



more Reliable Outstanding injection mechanism assures precision when injecting small volumes

Wide linearity from 0.1 μL to 50 μL

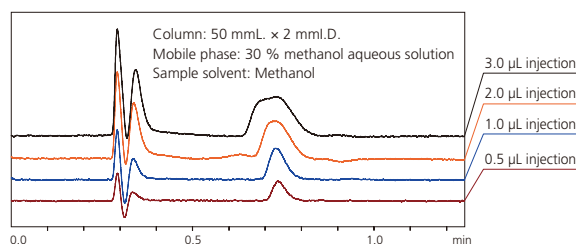
The SIL-30ACMP supports an injection volume range of 0.1 μL to 50 μL . Linearity is achieved within a broad injection range from injection of small volume required on a UHPLC up to the order of several tens of μL used on conventional models. The SIL-30ACMP provides excellent repeatability even in the injection of a volume of 1 μL or less.



Injection Volume (μL)	Repeatability (n = 6)	Injection Volume (μL)	Repeatability (n = 6)
0.1	0.67%	2	0.09%
0.2	0.32%	5	0.05%
0.5	0.26%	10	0.05%
0.7	0.14%	20	0.04%
1	0.11%	50	0.03%

Injection Repeatability (Actual Values)

As shown in the figure to the right, column sizes with an I.D. of approximately 2 mm, which are often used on a UHPLC, are susceptible to the influence of sample solvents, and it may be difficult to increase the injection volume. However, since the SIL-30ACMP is capable of high-precision injection of small volumes, the influence of sample solvents can be suppressed even if pretreated organic solvent-rich samples are injected directly.



In the case of sample solvents having an elution strength greater than that of the mobile phase, the peak shape is sometimes deformed when the injection volume is increased.

more Capacity Open access design enables the loading of samples, even during analysis

Mixture of 3 plates possible

The SIL-30ACMP accommodates 6 microtiter plates (96/384MTP, DWP) or plates for 1.5 mL vials. With 96-well plates, up to 576 samples can be loaded, and with 384-well plates, up to 2304 samples can be loaded at a time. Even with 1.5 mL vials, 324 samples can be loaded, which means that large amounts of samples can be handled with sufficient margin even as a stand-alone unit.



Designed with emphasis on open access

In an open access environment, in which two or more researchers share one system, the ability to load different plates on each rack becomes all the more advantageous. The SIL-30ACMP provides a flexible analysis environment where, for example, one person can be performing on-time analysis with 1.5 mL vials while another is loading a microplate for large-volume analysis. Vials or plates can be replaced even while analysis is in progress. Moreover, the SIL-30ACMP is designed to prevent your hands from coming into contact with the arm or other moving parts (closed-type design). This prevents unexpected accidents during sample replacement from happening.

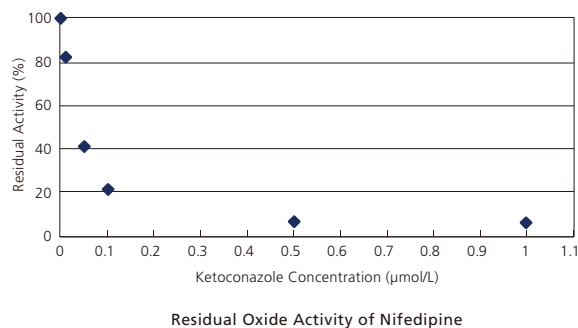
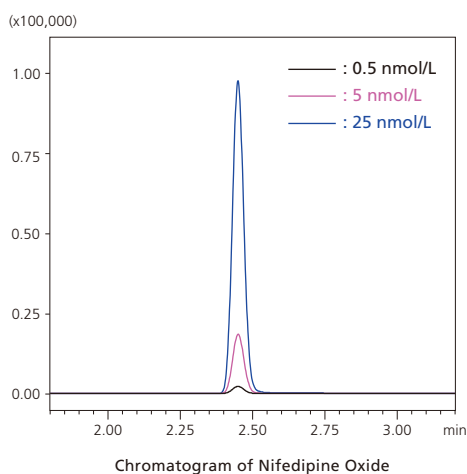
Expansion of the application range by LC/MS/MS

Example of Drug Interaction Testing

With pharmacokinetics, large numbers of samples must be analyzed at high speed and with high precision. By combining the SIL-30ACMP and LCMS-8030, the advantages of the high-precision injection mechanism of the SIL-30ACMP and the reliable quantitative performance of the LCMS-8030 can be utilized, even in drug interaction tests like the one shown below.

■ Linearity of Nifedipine Oxide Standard Solution

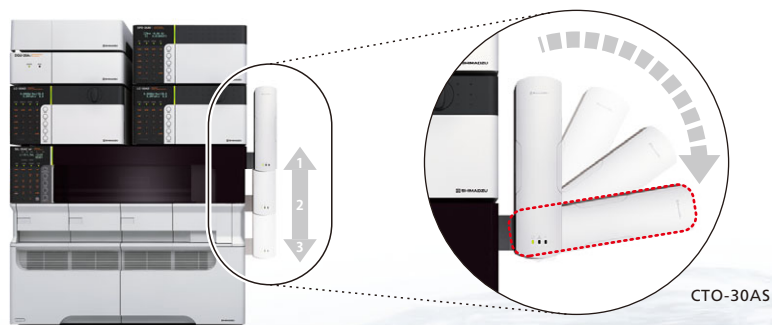
Measurement Standard Sample (nmol/L)	Preparation Concentration (nmol/L)	Measurement Concentration (nmol/L)	Relative Error (%)
0.05	0.05	0.043	-13.2
0.5	0.5	0.56	12.0
5	5	5.1	2.0
25	25	24.8	-0.1
250	250	242.3	-3.1
500	500	507.6	1.5



Column: Shim-pack XR-ODSII (50 mL × 2.0 mm I.D., 2.2 µm)
 Mobile phase: 0.1 % formic acid water/methanol; Gradient elution
 Flow rate: 0.4 mL/min
 Ionization mode: ESI(+)

Minimized the column – mass spectrometer distance

On an LC/MS system, shortening the piping from the column to the MS is important. The optional CTO-30AS Column Oven is installed on the side of the SIL-30ACMP. Its installation height (3 levels) and angle (between vertical and almost horizontal) can be adjusted to align with the height of the detector. Since the column outlet can be aligned with the detector's entrance and the height of the LC/MS interface, piping after exiting the column is much shorter. This minimizes peak dispersion and achieves ultrafast, high-separation analysis by making full use of the column's performance.



Open access improves analysis efficiency

Speedy analysis of a large quantity of samples by open access

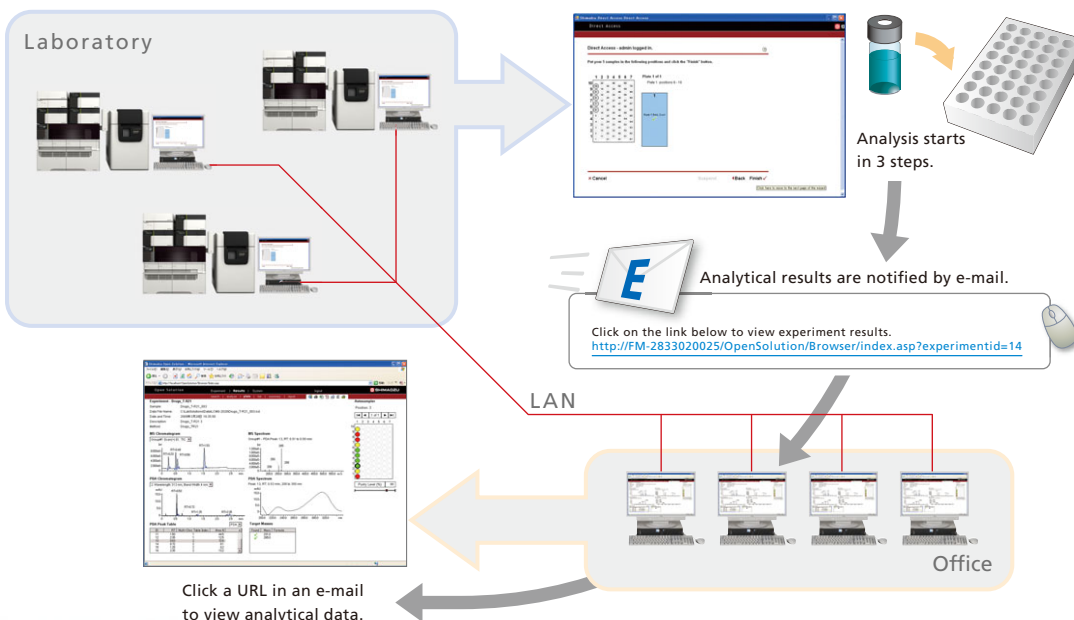
Three sample racks in the SIL-30ACMP are recognized automatically and allow samples to be loaded at any time except when samples are being injected. Two or more experimenters can comfortably share one system. Analyses that used to require multiple systems can now be conducted using one system, saving energy and reducing running costs. A comfortable analysis environment can be built by combining the SIL-30ACMP with Open Solution open access software.



Large numbers of compounds are processed simply and speedily when combining the SIL-30ACMP and LCMS-2020.

Simple analysis environment by Open Solution

Because Open Solution uses Microsoft Corporation's Internet Explorer, there is no need to install any other special software on each PC. Moreover, there are only three operations from login to start of analysis. Analytical results can also be quickly checked on Internet Explorer and easily output in predetermined formats.





JQA-0376

Founded in 1875, Shimadzu Corporation, a leader in the development of advanced technologies, has a distinguished history of innovation built on the foundation of contributing to society through science and technology. We maintain a global network of sales, service, technical support and applications centers on six continents, and have established long-term relationships with a host of highly trained distributors located in over 100 countries. For information about Shimadzu, and to contact your local office, please visit our Web site at www.shimadzu.com



SHIMADZU CORPORATION. International Marketing Division

3. Kanda-Nishikicho 1-chome, Chiyoda-ku, Tokyo 101-8448, Japan

Phone: 81(3)3219-5641 Fax: 81(3)3219-5710

URL <http://www.shimadzu.com>

Company names, product/service names and logos used in this publication are trademarks and trade names of Shimadzu Corporation and its affiliates. In this publication, those names and logos may be used without trademark symbol "TM" or "®".

Third-party trademarks and trade names may be used in this publication to refer to either the entities claiming the marks and names or their products. Shimadzu Corporation disclaims any proprietary interest in trademarks and trade names other than its own.

The contents of this publication are subject to change without notice. Shimadzu does not assume any responsibility or liability for any damage, whether direct or indirect, relating to, or arising out of the use of this publication.