

GAS CHROMATOGRAPHY AUTOSAMPLER SYRINGES

CTC PAL® System Combi PAL / PAL Combi-**xt** Headspace



Hamilton offers a headspace syringe featuring a unique plunger designed specifically for the CTC PAL System Combi PAL®-**xt** gas chromatography (GC) autosampler. The High Dynamic (HD) plunger is optimized for high-throughput, excellent reproducibility, and sets a new standard for headspace syringes.

Modern GC headspace analysis, such as ITEX, requires injecting over large temperature ranges. Conventional headspace syringes on the market use a rubber O-ring sealed plunger which has a limited sealing performance at high temperatures due to varying thermal expansion between the different materials. The high dynamic HD-Type syringe employs a unique spring in the plunger tip which compensates for the materials' different expansion coefficients, creating a better seal over a larger temperature range, and it also improves lifetime.

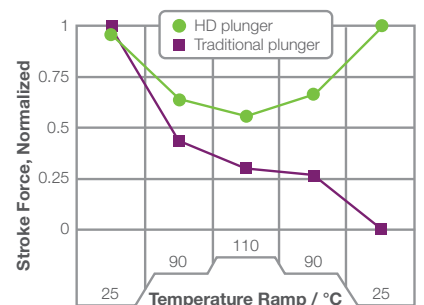
Market Comparison

A head-to-head comparison with other conventional syringes used for GC headspace demonstrates Hamilton HD-Type syringes perform better in a wider range of temperatures. In the study, sealing performance was estimated by measuring the force needed to move the plunger in the glass barrel. The force was monitored for a temperature ramp from 25°C to 110°C and back to 25°C. The HD-plunger demonstrated improved sealing performance at higher temperatures (110°C and above) and did not lose its sealing properties during cool down as is often a problem with traditional plungers. Instead, the HD plunger dynamically reacted to temperature changes and compensated for the thermal expansion of the PTFE tip, maintaining a perfect seal.

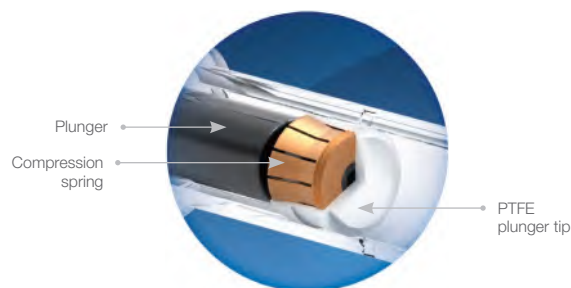
Benefits of Hamilton CTC PAL System Combi PAL Autosampler Headspace Syringes:

- Unique spring-in-plunger design creates a dynamic seal between the plunger tip and the inside of the glass barrel for leak-free operation
- Excellent performance over a large temperature range
- Increased lifetime compared to traditional headspace syringes
- Improved accuracy and reproducibility of GC headspace analyses

Sealing Performance of HD and Traditional Plungers



The HD-Type Syringe Design



Hamilton HD-Type Syringes are Specially Designed for the CTC PAL System Combi PAL-xt and Combi PAL-xt Extended Autosamplers Sold Under the Following Brands:

- AB SCIEX™
- Agilent
- Alpha M.O.S.
- Antek
- Bruker
- Dionex®
- GE®
- GERSTEL®
- GL Sciences
- Lauda
- LEAP Technologies
- MicroCal™
- MPS
- PERICHROM
- PerkinElmer®
- Shimadzu
- SOTAX
- Thermo Scientific®
- Waters®
- Zoex



Hamilton CTC PAL System Combi PAL syringes are Gastight® syringes with a PTFE plunger tip that creates a tight seal between the syringe barrel and plunger allowing for liquid or gas sampling.

Ordering Information

| Volume | Hamilton P/N | PAL System P/N | Description | Gauge | Point Style |
|--------|--------------|-----------------|-----------------------|-------|-------------|
| 1.0 mL | 203082 | SYRC HS1.0-23-5 | Model 1001 HD CTC SYR | 23 | 5 |
| 2.5 mL | 203084 | SYRC HS2.5-23-5 | Model 1002 HD CTC SYR | 23 | 5 |
| 5.0 mL | 203086 | SYRC HS5.0-23-5 | Model 1005 HD CTC SYR | 23 | 5 |
| 1.0 mL | 203141 | SYRC HS1.0-26-5 | Model 1001 HD CTC SYR | 26 | 5 |
| 2.5 mL | 203181 | SYRC HS2.5-26-5 | Model 1002 HD CTC SYR | 26 | 5 |
| 5.0 mL | 203182 | SYRC HS5.0-26-5 | Model 1005 HD CTC SYR | 26 | 5 |

All syringes listed feature a Luer Tip Cemented (LTN) needle termination.

For more information on these and other Hamilton syringes, including information on terminations, point styles, gauges, and other specifications, please visit www.hamiltoncompany.com/syringes.

© 2023 Hamilton Company. All rights reserved.
 PAL is a registered trademark of CTC Analytics AG, Switzerland.
 AB SCIEX is the property of AB Sciex Pte. Ltd.
 Thermo Scientific and Dionex are registered trademarks of Thermo Fisher Scientific Inc.
 GE, imagination at work and GE monogram are trademarks of General Electric Company.
 MicroCal is a trademark of GE Healthcare companies.
 GERSTEL is a registered trademark of GERSTEL GmbH & Co. KG.
 Waters is a registered trademark of Waters.
 PerkinElmer is a registered trademark of PerkinElmer, Inc.
 All trademarks are owned and/or registered by Hamilton Company in the U.S. and/or other countries.

Lit. No. 20087 Rev. D – 09/2023

HAMILTON

Hamilton Americas & Pacific Rim
 Hamilton Company Inc.
 4970 Energy Way
 Reno, Nevada 89502 USA
 Tel: +1-775-858-3000
 Fax: +1-775-856-7259
 sales@hamiltoncompany.com

Hamilton Europe, Asia & Africa
 Hamilton Central Europe S.R.L.
 str. Hamilton no. 2-4
 307210 Giarmata, Romania
 Tel: +40-356-635-055
 contact.lab.ro@hamilton-ce.com

Web: www.hamiltoncompany.com
 USA: 800-648-5950
 Europe: +40-356-635-055

To find a representative in your area, please visit: www.hamiltoncompany.com/contacts

