

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

# Gas Chromatography Autosampler Syringes Product Datasheet



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.

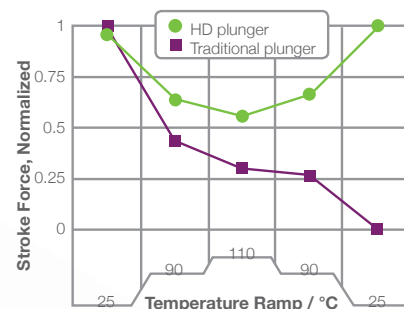
## Market Comparison

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.

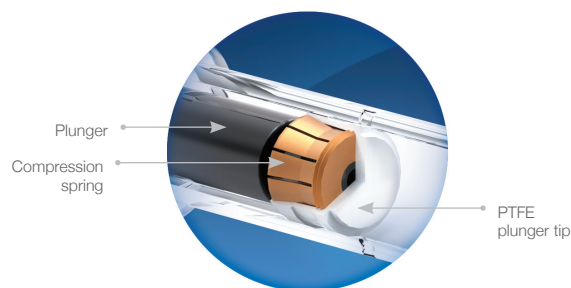
## Benefits of Hamilton CTC PAL System Combi PAL Autosampler Headspace Syringes:

- 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	Fisher Scientific Catalog No.	PAL System P/N	Description	Gauge	Point Style
1.0 mL	14-685-110	SYRC HS1.0-23-5	Model 1001 HD CTC SYR	23	5
2.5 mL	14-685-200	SYRC HS2.5-23-5	Model 1002 HD CTC SYR	23	5
5.0 mL	14-685-201	SYRC HS5.0-23-5	Model 1005 HD CTC SYR	23	5
1.0 mL	14-785- 624	SYRC HS1.0-26-5	Model 1001 HD CTC SYR	26	5
2.5 mL	14-785- 625	SYRC HS2.5-26-5	Model 1002 HD CTC SYR	26	5
5.0 mL	14-785- 626	SYRC HS5.0-26-5	Model 1005 HD CTC SYR	26	5

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

### In the United States:

For customer service, call 1-800-766-7000  
 To fax an order, use 1-800-926-1166  
 To order online: fishersci.com

### In Canada:

For customer service, call 1-800-234-7437  
 To fax an order, use 1-800-463-2996  
 To order online: fishersci.ca



© 2018 Thermo Fisher Scientific Inc. All rights reserved.  
 Trademarks used are owned as indicated at fishersci.com/trademarks.

©2018 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 other trademarks are owned and/or registered by Hamilton Company in the U.S. and/or other countries.