

# CTC Combi PAL®-xt and -xt Extended Headspace Mode Gas Chromatography Autosampler Syringes Product Datasheet



Hamilton offers a headspace syringe featuring a new plunger designed specifically for the CTC Combi PAL®-xt gas chromatography (GC) autosampler system. 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.

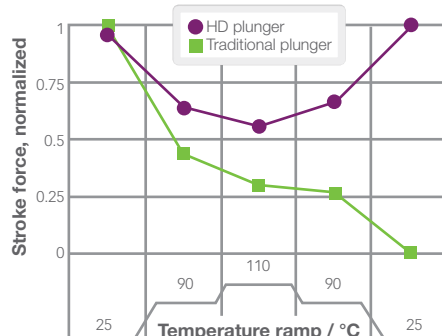
## Market Comparison

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 new 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.

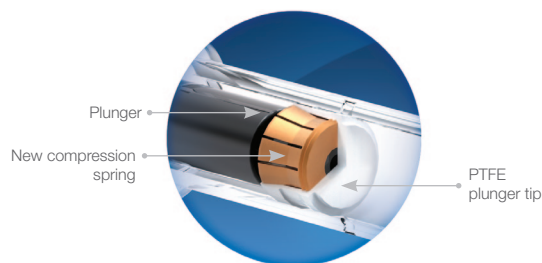
## Benefits of Hamilton CTC Combi PAL® Autosampler Headspace Syringes:

- ▶ 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

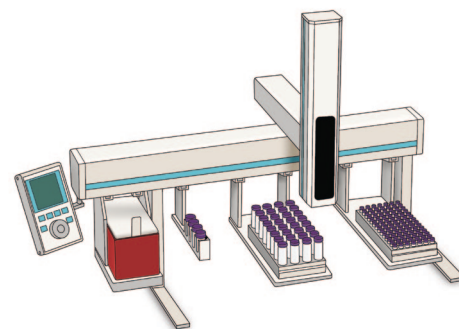


## The HD-Type Syringe Design



**Hamilton HD-Type syringes are specially designed for the CTC Combi PAL®-xt and Combi PAL®-xt extended autosamplers sold under the following brands:**

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



Hamilton CTC 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

Part Number	Volume	Description	Gauge	Point Style
203082	1.0 mL	Model 1001 LTN CTC	23	5
203084	2.5 mL	Model 1002 LTN CTC	23	5
203086	5.0 mL	Model 1005 LTN CTC	23	5
203141	1.0 mL	Model 1001 LTN CTC	26	5
203181	2.5 mL	Model 1002 LTN CTC	26	5
203182	5.0 mL	Model 1005 LTN CTC	26	5

All syringes listed feature a Luer Tip Cemented (LTN) needle termination, and the needles are 51 mm (2 inches) in length.

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](http://www.hamiltoncompany.com/syringes).

© 2013 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.  
 Lit. No. L20087 Rev. B

# HAMILTON®

Web: [www.hamiltoncompany.com](http://www.hamiltoncompany.com)

USA: 800-648-5950

Europe: +41-81-660-60-60

### 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](mailto:sales@hamiltoncompany.com)

### Hamilton Europe, Asia, & Africa

Hamilton Bonaduz A.G.  
 Via Crusch 8  
 CH-7402 Bonaduz, Switzerland  
 Tel: +41-81-660-60-60  
 Fax: +41-81-660-60-70  
[contact@hamilton.ch](mailto:contact@hamilton.ch)

To find a representative in your area, please visit [hamiltoncompany.com/contacts](http://hamiltoncompany.com/contacts).