

## Agilent 1260 Infinity II Prime Workflows

## **Technical Note**

This note guides you through the main differences in instrument operation while upgrading from 1260 Infinity II Quaternary (G7111B) to 1260 Infinity II Prime (G7104C) LC.

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# Summary and Benefits of Prime Workflows

Workflow	Definition of Workflow	Why is the Prime Workflow Different?	Benefits of 1260 Infinity II Prime
Priming	Priming is done upon installation of the system or when the system has no solvent present and has become dry (empty bottle heads)	With the Multipurpose Valve, the system can automatically purge the lines without the user's presence at the instrument	Automatic Multipurpose Valve for remote control
Preparing for Analysis	Purging and then equilibrating the system for analysis.	The typical piston movement of the 1260 Infinity II Prime Pump is optimized to deliver flow more accurately and precisely. This method, however, is not as efficient at dissolving micro air bubbles in the flow path. The conditioning function moves the pistons in a way to dissolve micro air bubbles	Prime Pump piston movements results in more accurate and precise flow
Setting up a Method	Writing a method in the Chromatography Data System (CDS)	The 1260 Infinity II Prime Pump uses solvent compressibility tables to actively optimize the compressibility value needed for the compression of solvent to the system pressure	Prime Pumps have the optimized compression step automatically based on the system pressure and composition
Diagnostic Signals	Monitoring the health of the system	The Prime Pump essentially has no ripple because of the optimized piston movements. Therefore, the active tuning monitors the health of the system	Prime Pumps have essentially no ripple and actively tunes for optimized pump performance

#### Table 1 Summary and benefits of prime workflows



# Priming

# Priming Workflow for 1260 Infinity II (G7111B) Using Isopropanol

- 1 Open the purge valve of your pump by turning it counterclockwise.
- 2 Open the Method dialog box via right-click the pump dashboard then select Method.
- **3** Set the flow rate to 5 mL/min.

		Quat. Pump (G7111B)	
Flow		Advanced	
	5.000 1 mL/min	Timetable (empty)	

4 Select 100 % for solvent channel A.

Solvents	
A:	100.0 ; %
B:	☑ 0.0 ÷ %
C:	✓ 0.0 ÷ %
D:	☑ 0.0 ≎ %

- 5 Turn on the flow.
- **6** Observe if the solvent in the tubing of channel A is advancing towards the pump. If not, follow the substeps:
  - a Disconnect the solvent tubing from the MCGV.
  - **b** Attach a syringe with a syringe adapter and pull the liquid through the degasser.
  - c Re-attach the tubing to the MCGV.
- 7 Pump 30 mL isopropanol to remove residual air bubbles.
- 8 Switch to the next solvent channel and repeat the two preceding steps until all channels have been purged.
- **9** Turn off the flow and close the purge valve.

# Priming Workflow for 1260 Infinity II Prime (G7104C) Using Isopropanol

1 Right-click the pump dashboard and select Prepare Pump.



- 2 Select **Purge** and set the parameters:
  - Duration: 5 min
  - Flow: 3 mL/min
  - Composition: 100 % A

1	Purge			
N	Use for ch	anging mobile phases, drav	wing solvent or for remo	oving air bubbles.
	Duration:	5.00 📫 min	Composition A:	100.00 1 %
	Flow:	3.000 ÷ mL/min	Composition B:	0.00 ÷ %
			Composition C:	0.00 📫 🗞
			Composition D:	0.00 📫 %

- 3 Click Start.
- **4** Observe if the solvent in the tubing of channel A is advancing towards the pump. If not, follow the substeps:
  - a Disconnect the solvent tubing from the MCGV.
  - **b** Attach a syringe with a syringe adapter and pull the liquid through the degasser.
  - c Re-attach the tubing to the MCGV.
- 5 Wait for the pump to automatically stop purging after 5 min.
- **6** Switch to the next solvent channel and repeat the preceding steps until all channels have been purged.

# Preparing for Analysis

## Preparing for Analysis Workflow for 1260 Infinity II (G7111B)

- 1 Open the purge valve of your pump by turning it counterclockwise.
- 2 Open the **Method** dialog box via right-click the pump dashboard then select **Method**.
- 3 Set the flow rate to 5 mL/min.

		Quat. Pump (G7111B	
Flow	1	D Advanced	
	5.000 : mL/min	Timetable (empty)	

- 4 Flush the vacuum degasser and all tubes with at least 10 mL of solvent.
- 5 Set the required composition and flow rate for your application and close the purge valve.
- 6 Pump for approximately 10 min before starting your application.

## Preparing for Analysis Workflow for 1260 Infinity II Prime (G7104C)

1 Right-click the pump dashboard and select Prepare pump....



- 2 Select Purge and set the parameters:
  - Duration: 5 min
  - Flow: 3 mL/min
  - Composition: 100 %

Purge			
Use for ch	anging mobile phases, drawi	ng solvent or for rem	oving air bubbles.
Duration:	3.00 📫 min	Composition A:	100.00 📜 %
Flow:	3.000 🕂 mL/min	Composition B:	0.00 📫 %
K.		Composition C:	0.00 📫 %
		Composition D:	0.00 📫 %

- 3 Click Start.
- 4 The pump will automatically stop purging after 3 min.
- 5 Switch to the next solvent channel and repeat the preceding steps, if necessary.
- 6 Turn on the pump with your method loaded.
- 7 Right-click the pump dashboard and select Prepare pump....
- 8 Select Conditioning.

Conditioning		
Minimize the pressure ripple by dissolving air bubbles in the pump heads.		
<ul> <li>Note: Solvents will flow through the LC system and column. Method parameters are applied for flow rate, composition and max. pressure.</li> </ul>		
Duration: 10.00 🗼 min		

9 Set the Duration to 10 min.

The pump will condition the system (pumping through the column). After 10 min, it begins pumping using the standard piston movement onto the column.

**10** Pump for approximately 5 min after conditioning, then start your application.

# Setting up a Method

## Setting up 1260 Infinity II Method (G7111B)

## HINT

To access the Online help for additional information, click into the dashboard and press F1.

- 1 Open the **Method** dialog box via right-click the pump dashboard then select **Method**.
- 2 Set Flow, the starting composition in the Solvents section, Pressure limits, Stoptime, and Posttime.
- **3** Create gradients via the **Timetable**.
- **4** To set **Compressibility** correctly for most stable flow, expand the advanced tab for further method parameters.

At Method of G7111B (CQ78054398)		-	
	Quat.	Pump (G7111B)	
Flow	Advanced		
1.000 ÷ mL/min	Minimum Stroke		
Solvents         A:       60.0 : %         B:       ✓         40.0 : %         C:       ✓         0:       ✓         0.:       %	<ul> <li>Automatic</li> <li>20 : µL</li> <li>Compressibility</li> <li>€ 44 : ~10.<sup>4</sup>/bar</li> <li>No compensation</li> </ul>		
Pressure Limits	Maximum Flow Gradient		
Min: 0.00 that Max: 600.00 that bar Stoptime Posttime	100.000 ; mL/min <sup>2</sup>		
As laiseter Ma Linit	Primary Channel		
As injector/vo Limit     U     Off	Automatic 👻		
Import Timetable			
1	Timetable (3/100 events)		
		Ok Apply	Cancel

## Setting up 1260 Infinity II Prime Method (G7104C)

- 1 Right-click the pump dashboard and select Method.
- 2 Set Flow, the starting composition in the Solvents section, Pressure limits, Stoptime, and Posttime.
- 3 In the **Solvents** section, select the solvents you are using or solvents similar to what you are using.

This automatically sets the **Compressibility** to ensure flow accuracy and precision.

- 4 Create gradients via the **Timetable**.
- 5 Expand the advanced tab for more method parameters.

At Method of G7104C (FD94104823)	-	
×	Quat. Pump (G7104C	
Flow	Advanced	
[1.000 🗧 mL/min	Minimum Stroke	
Solvents	Automatic	
Enable Blend Assist		
A: 60.00 🕻 % 100.0 % Water V.03 💌	Compressibility	
B: 🗹 40.00 🛟 % 100.0 % Acetonitrile V.03 🔻	Use Solvent Types	
C: 🖌 0.00 - % 100.0 % Acetonitrile V.03 -	Maximum Flow Gradient	
D: 🗹 0.00 🛟 % 100.0 % Aqueous V.03 💌	Flow ramp up: 100.000 ; mL/min <sup>2</sup> Flow ramp down: 100.000 ; mL/min <sup>2</sup>	
Pressure Limits	Primary Channel	
Min: 0.00 🛟 bar Max: 800.00 🛟 bar	Automatic 🔹	
Stoptime Posttime	Mixer Selection	
O         As Injector/No Limit         ●         Off           ●         5.00 :         min         ○         1.00 :         min	Use Mixer if installed 👻	
Import Timetable		
	Timetable (3/100 events)	
	▷ ISET	
	Ok Apply	Cancel

## NOTE

To use BlendAssist or ISET, see the "Appendix" on page 12.

# Diagnostic Signals

## Visible with 1260 Infinity II (G7111B)

**Ripple Percentage** 

- Usually less than 2 % when the system is equilibrated. Results are often better.
- Excessive Ripple is indicative of a problem.
  - Problems with solvent compressibility settings
  - Stroke volume
  - Leaks in the system
  - Air in the system
  - Immiscible solvents

Quat. Pump		
	Idle	
	EMF⊘	
A       B         100.0       0.0         C       D         0.0       0.0	0.000 mL/min  1.33 bar	
Flow	0.000 mL/min	
Pressure	1.33 bar	
Ripple	0.00 %	
Pressure Limit	600.00 bar	
Limited by Method		
Composition A	100.0 %	
Composition B	0.0 %	
Composition C	0.0 %	
Composition D	0.0 %	

## Visible with 1260 Infinity II Prime (G7104C)

Tuning

For pumps operating as expected, the signal should stay in a range of -1 to +1 within the full scale of -2 to +2. Ideal performance is at 0.

Change in behavior could be caused by:

- gas bubbles in primary chamber
- suboptimal compressibility settings
- major leaks in seals or fittings
- problems with the valves
- blockage of filters or capillaries

## NOTE

The tuning value does not change during the functions Prime or Conditioning

Quat. Pum	np?
	Idle
❶On	EMF⊘
▲ 🗗	
100.00 0.00	1.000 mL/min
C D	0.00 bar
Flow	1.000 mL/min
Pressure	0.00 bar
Tuning	-2.000
Pressure Limit	800.00 bar
Limited by Me	ethod
Composition A	100.00 %
Composition B	0.00 %
Composition C	0.00 %
Composition D	0.00 %
Valve Position	No Mixer
Prepare Pump	Idle

## Appendix

#### Intelligent System Emulation Technology for Prime

- Emulate other (U)HPLC instruments with a click
- Run existing (U)HPLC methods without modifying the method or system
- Deliver equivalent retention times and peak resolution for better method transfer

Watch a video







#### **BlendAssist for Prime**

Interested in method development? Analyzing analytes using similar buffer concentrations? Then BlendAssist could be a solution for you.

ISET

Watch a video











#### Benefits of Jet Weaver for Prime

The Jet Weaver is a mixing device designed to offer highest mixing efficiency at lowest delay volume. The optionally available V380  $\mu$ L Jet Weaver is optimized for demanding applications, for example using TFA as a modifier. The Multipurpose Valve allows automatically including or removing the Jet Weaver from the flow path. This Jet Weaver adds 150  $\mu$ L delay volume which sums up to less than 500  $\mu$ L total pump delay volume.

- G4204-68035 Jet Weaver Mixer Kit V35 Quat/Flex
- G4204-68100 Jet Weaver Mixer Kit V100 Quat/Flex
- G4204-68380 Jet Weaver Mixer Kit V380 Quat/Flex

#### Positions of the Multipurpose Valve





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