Application Note

AT Xtend™ – Choosing the right sampling cannulas

Purpose of this document
This document outlines the sampling cannula options provided by SOTAX, detailing the differences between manual and automated solutions. Key considerations such as hydrodynamic effects and filtration requirements are also discussed.

Contents

1 Powerful Sampling and Filtration Options with SOTAX Dissolution Systems

Dissolution sampling and filtration processes vary widely depending on the analytical method and the requirements of pre-established protocols. Factors such as filter pore sizes, styles, and membrane types can differ significantly, and laboratories must adapt their approach to meet method-specific needs. The good news is that SOTAX systems are engineered to excel in these scenarios, offering unmatched flexibility and performance – regardless of the level of automation.

2 SOTAX Sampling Options

2.1 Adaptability Across Methods

SOTAX systems seamlessly mimic various sampling environments and adapt to a wide range of filter types, ensuring compatibility with even the most demanding dissolution methods.

2.2 Comprehensive Sampling Options

Manual Sampling:
SOTAX offers a diverse range of cannula designs (refer to the attached table) to meet various vessel configurations and testing requirements. These ensure precise sampling with a variety of filter configurations.

Automated Sampling:
With advanced automation capabilities, SOTAX systems can replicate a variety of sampling styles, including AutoLift™ probes, resident probes, and hollow-shaft systems. These innovations ensure compliance with established protocols while providing seamless integration into your workflow. They provide high-frequency sampling without compromising precision and are designed to accurately process and prepare samples for downstream analysis, even under the most demanding conditions.

2.3 Powerful Filtration Capabilities

SOTAX systems deliver rapid sampling while supporting a variety of filtration options for a wide range of methods such as UPLC analysis.

Need more information about filtration?
See Application Note BN10010EN - Filter Selection and Validation.

3 Physical Properties

3.1 Material Compatibility

Most sampling cannulas are made of corrosion- and acid-resistant **stainless steel** for durability and longevity. For special applications, however, some cannulas are also available in **PEEK**, a high-performance thermoplastic that is resistant to high temperatures and virtually all organic and inorganic chemicals.

3.2 Shape

Figure 1: Manual sampling cannula bent 45°

Figure 2: Sampling cannula with filter cap straight

As detailed in “Overview Sampling Cannulas”, both straight and bent sampling cannulas are available. But why do some cannulas have a bent tip? Bent cannulas, for example, are essential for manual systems with AutoLift™ to facilitate sampling past the AutoLift™ mechanism. Similarly, when transitioning from a manual system to an automated one, comparative measurements may be required—this involves simultaneous manual and automated sampling, which also necessitates the use of bent cannulas (P/N 22477). Additionally, angled cannulas can enhance the convenience of manual sampling. For instance, the angled Resident Sampling Probe (P/N 302726) prevents distortion of the sampling tube, making it a practical choice.

3.3 Luer Lock

The luer lock is a standardized system of small-scale fluid fittings used for making leak-free connections between a male-taper fitting and its mating female part on medical and laboratory instruments, including hypodermic syringe tips and needles or stopcocks and needles.

4 Selecting the Right Sampling Cannula

Choosing the appropriate sampling cannula involves carefully assessing specific requirements. For instance, it may be necessary to select a cannula designed for a particular filtration method or one tailored to a specific sampling approach, whether manual or semi-automated. In some cases, opting for a cannula that is initially compatible with manual use but can later be adapted for semi-automated testing may provide added flexibility.

5 Overview Sampling Cannulas

5.1 Common Vessel Shapes

Picture	Description	Article No	Cannula Filter	Membrane Filter	Syringe Filter	Manual	Semi-automated	Can only be used with AutoLift™	Pipette guidance*	Diameter (o.d./i.d. in mm)
	HollowShaft™, syringe filter, for AT Xtend™ and AT 7smart semi-automated	7570-1			•	•	•			-
	HollowShaft™, membrane filter, for AT Xtend™ and AT 7smart semi-automated	7710-1		•		•	•			-
	Sampling cannula with filter cap, vessel 1L straight, for AT 7smart	10156	•	•		•	•		•	3/2.5
	Sampling cannula with filter cap, vessel 2L straight, for AT 7smart	10156-02	•	•		•	•		•	3/2.5
	Sampling cannula with filter cap, straight, vessel 1L / 2L, for AT Xtend™ with AutoLift™	10156-06	•	•		•	•	•		3/2.5
	Sampling cannula with filter cap, straight, vessel 1L, for AT Xtend™	10156-09	•	•		•	•		•	3/2.5
	Sampling cannula with luer lock, straight, vessel 1L / 2L, for AT Xtend™ with AutoLift™	14549-02	•		•	•	•	•		3/2.5
	Manual sampling cannula with luer lock, bent 90°, vessel 1L / 2L, for AT Xtend™ with AutoLift™	14549-05	•		•	•	•	•		3/2.5

Picture	Description	Article No	Cannula Filter	Membrane Filter	Syringe Filter	Manual	Semi-automated	Can only be used with AutoLift™	Pipette guidance*	Diameter (o.d./i.d. in mm)
	Manual sampling cannula with luer lock, bent 45°, vessel 1L, for individual sampling zone	22477-01	●		●	●				3/2
	Manual sampling cannula with luer lock, bent 45°, vessel 1L, for 500mL sampling zone	22477-02	●		●	●				3/2
	Manual sampling cannula with luer lock, bent 45°, vessel 1L, for 900mL sampling zone	22477-03	●		●	●				3/2
	Sampling cannula with luer lock, straight, vessel 1L, for AT Xtend™ / AT 7smart	5702	●		●	●	●		●	3/2.5
	Sampling cannula adjustable with luer lock, bent 90°, vessel 1L, for AT 7smart / AT Xtend™	302726-01	●		●	●	●			3/2.2
	Sampling cannula adjustable with luer lock, bent 90°, vessel 1L, for AT 7smart / AT Xtend™	302727-01			●	●	●			1.6/1.1
	Sampling cannula adjustable with luer lock, made of PEEK, bent 30°, vessel 1L, for AT 7smart / AT Xtend™	Y050-1270	●		●	●	●			3.2/1.5
	Sampling cannula with luer lock, made of PEEK, bent 30°, vessel 1L / 2L, for AT Xtend™	20600-01	●		●	●	●	●		3.2/1.6
	*Guide tube for pipette or cannula, for AT 7smart (manual) and AT Xtend™	5432								

● = Applicable

5.2 Special Vessel Shapes

The unique SOTAX HollowShaft™ technology allows sampling directly through the paddle/basket shaft, making it suitable for many specialty vessels. Fully compliant with USP <711> and other Pharmacopeia, the HollowShaft™ is also proven to virtually eliminate any undesired hydrodynamic effects that may impact dissolution results.

Picture	Description	Article No	Cannula Filter	Membrane Filter	Syringe Filter	Manual	Semi-automated	Can only be used with AutoLift™	Pipette guidance*	Diameter (o.d./i.d. in mm)
	Sampling cannula, china vessel with luer lock connector outer cone, for AT Xtend™ and AT 7smart	9758	●		●	●	●			3/2.5
	HollowShaft™, syringe filter, for AT Xtend™ and AT 7smart semi-automated	7570-1			●	●	●			-
	HollowShaft™, membrane filter, for AT Xtend™ and AT 7smart semi-automated	7710-1		●		●	●			-

● = Applicable