

DISSOLUTION ACCESSORIES

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Technical Bulletin



Doc: 800.001.1

How to determine the correct cannula.

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When performing dissolution tests a sample moment have to be determined. For the sampling, you can use a full-automated sampling mechanism, a flow through system, or sample with cannulas. The USP set some rules/guidelines for sampling:

“Sampling position should be midway between the top of the basket/blade and the top of fluid no closer than 1 cm to the side of the vessel.”

Reliable sampling has to be accurate and repeatable, so different variables have to be taken into account.

As stated above the sampling point should be vertically in the midway between the top of apparatus and top of the fluid. Since the amount of media can be different (mostly used 500 or 900 ml), the length of the cannula will vary.

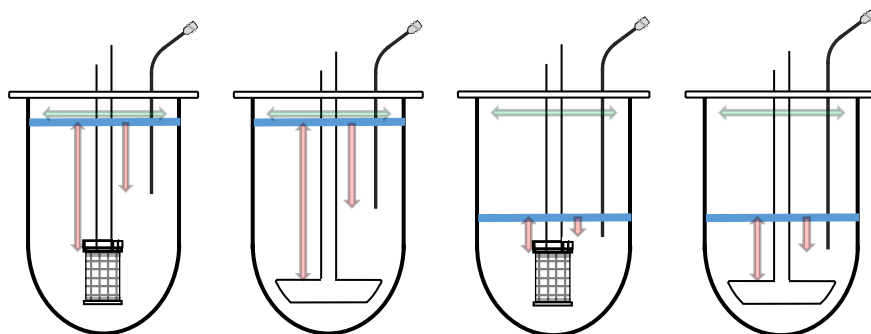


Figure 1 Different heights of cannula in a vessel.

The length is also depending on the depth of the vessel and if cannula is used through the head (e.g. Sotax, Hanson). In all these cases, a stopper can be used to achieve a reproducible sampling depth.

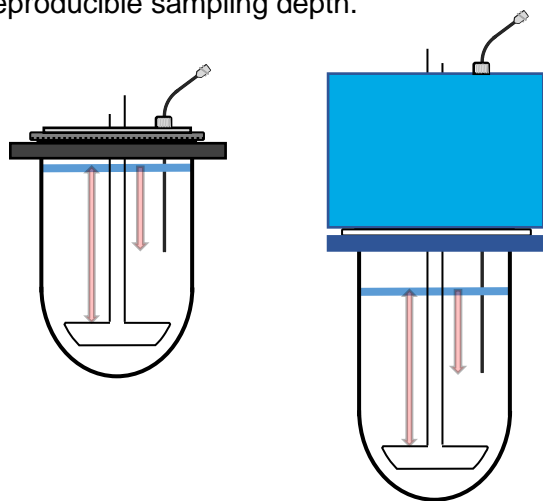


Figure 2 Different height of cannula due to close- and open mount systems.

Horizontally the position of the cannula is determined by the hole in the cover or dissolution system. The selection for the kind of stopper is important. Last, the inner diameter, when small sample amounts are taken, consider a small diameter cannula to reduce the dead volume.

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Physical dimensions cannula

- Length.
 - A larger volume of the dissolution media makes a cannula shorter. Since vessels are more or less the same diameter, a general rule can be used 18,75mm/100ml (for volumes between 500 and 1000 ml.)

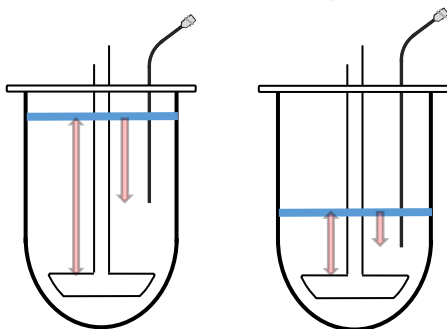


Figure 3 Probe height due to volume

- The type of system determines the length of the cannula. Cannulas used in close mount systems are longer. Sampling needs to be done from above the head. For example manual cannulas of a through head mount cannula is 7,5" larger then it's open mount counterpart. (see figure 2)
- You could say we take the largest cannula so it fits always. However often the space between the vessel and the head of the system will be limited.



Figure 4 Space between vessel and head (e.g. Hanson SR8, Vision Classic, and Vision Elite)

Some baths emphasize manual sampling (e.g. Vision Classic). Others on manual and automatic sampling. The last is a tradeoff, because the limited access (e.g. SR8, AT7, VK7010)

- Material
 - Stainless steel is most commonly used the cannula is durable and ridged
 - PEEK more inert (e.g. acids). Flexible more expensive and less ridged.
- Connections
 - A luer lock connection can easily disconnect the cannula from a syringe. The syringe can progressively be connected to an inline filter for filtration to stop particles to dissolve further in the liquid.

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- Inner and outer diameter
 - Most commonly used cannula's have an inner diameter of 1/16" or 1/32" and an outer diameter between 1/16" to 1/8". The use of cannula depends on using a sampling system, allowed dead volume and small sampled values. The outer diameter determines the use of specific cannula filters.



Figure 5 Cannula with cannula filter

- Stoppers
 - A cannula cannot be stationary in the cover or system head. The cannula will change the fluid dynamics in the vessel. This means a cannula needs to be introduced a certain time before a sampling point. This causes a problem to reproduce sampling height for all vessels. Stoppers are used to make sure sampling is performed correctly on the same, reproducible, height.



Figure 6 Cannula with stopper, which can be set on different height (left) versus a fixed stopper (right).

A stopper will be assembled on a cannula in such a way that it will block the cannula to go deeper into the vessel.

How to determine the right cannula:

- Which system (Universal, Distek, Hanson, Agilent/Vankel/Varian, Sotax, Erweka, Pharmatest, Electrolab, Logan, Caleva, Copley, Toyama, Zymark)
- Type of system, close mount or open mount (DT800, AT7, 7010, SR-8, Vision, Extend).
- Media volume in a vessel (A larger volume needs a smaller cannula).
- Syringes used (Most of the time this will be a luer connection).
- Used media (The cannula should be inert to media and sample).
- Type of cover (the OD of sampling hole determines the cannula and stopper).
- Type of stopper.

On the next page, you will find an explanation how to select the correct cannula in the catalog and on the web.

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The DA part number provides you with information about what you want to order:

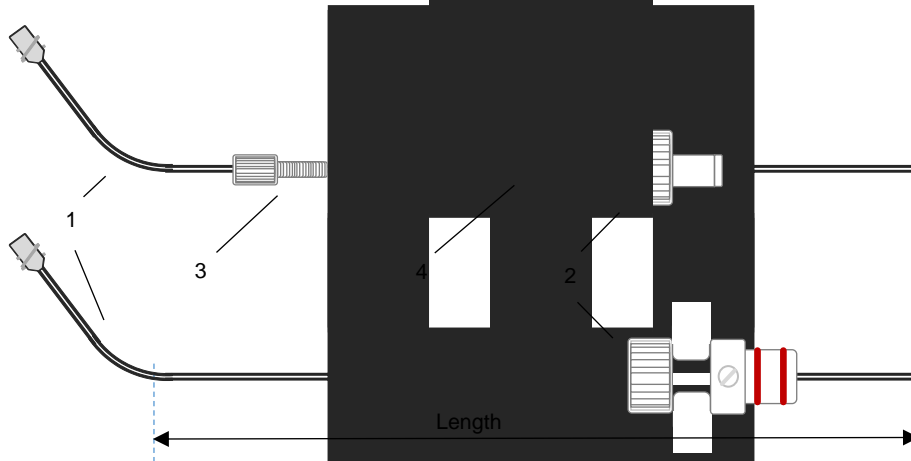


Figure 7 Cannula with PSCANSTP-065-53 and Cannula with PSCANSTP-ST

1. Cannula part number expansion

PSCAxxxx-xx-x

- Ext. Volume (e.g., 9 (900ml))
- Manufacturer (01, VK (Agilent), DK, DSV (Distek), HR (Hanson), KA (Erweka), ST (Sotax));
- Material (S (Stainless), Px (PEEK));
- Type (e.g., Lead)
- Length (e.g. 475(4.75"), 015(15"), S13 (small diameter 13")
- Cannula (e.g. CAN), Internal Diameter (e.g. CA8 1/8" cannula)

2. Stopper (3 Locking nut, 4 O-ring)

PSCANSTP-xxx-xx

- Stopper OD (.31", Agilent, Vankel) (.44", Hanson, Waters) (.53", Distek)
- Cannula OD (.065" (1/16), Distek, Hanson) (.078", Agilent, Vankel) (.125" (1/8), Hanson) (.142", Agilent, Vankel)
- Manufacturer system (EW (Erweka), PT (Pharmatest), ST (Sotax))
- Stopper
- Cannula