Nutech Editor

During our communication with customers, we have a quite frequent feedback: what we need is a 3.2L Summa canister and your 3L canister doesn't meet the requirement.
Even worse, some tenders specifically list 3.2L as a must-meet technical specification and in some cases even go further to emphasize this as a plus or eligibility (not eligible to bid if not meet). The 3L canisters are all rejected!
And when someone proposes doubts, the answer is always: this is specified in national standard and we are only complying with standard.
Yet in China method HJ759-2015, provision 5.7 gives a description on canister sizes: 3.2L, 6L or other specifications.
This doesn't exclude 3L from canister size specification. But oddly, this provision lists 3.2L which is a size only provided by one manufacturer in the world, instead of listing 3L which is a size provided by more manufacturers. Jason S. Herrington from Restek has a recent discovery that is surprising yet sense making. Jason is an important contributor to the newly released US EPA TO-15A and a scientist in Restek, a globally leading developer and manufacturer of capillary column and related accessories.
Note: This article is translated and cited from Jason S. Herrington's blog on Restek website. The citation is authorized by the author. Although we try our best to be precise, but the possibility of inaccurate understanding exists. Please click this links for the original article:

Not all 3.2 L air sampling canisters are 3 liters !. Wait . . . what !?

The other day a customer contacted me to share the following discrepancy she has observed on several occasions: "when I collect ambient air samples with Restek 3 L canisters and collocated 3.2 L canisters from the competition, the canisters fill in the same amount of time."
Obviously this does not make sense, so I immediately go into trouble-shooting mode asking questions like: what flow controllers, what size critical orifices, what flow rates, are all the canisters evacuated the same, etc...
At no point in time are we able to find anything out of the order.
The customer was running an "apples-to-apples" comparison and by all accounts the competitor's 3.2 L canisters should have more vacuum left at the end of the sampling duration when compared to our 3 L canisters.
At this point in time the only stone left un-turned (you already guessed it from the title of the blog) was the volume of the canisters.
We used the following two-pronged approach to determine the volume of our 3 L canisters and the competitors 3.2 L canisters:
1 Weighed the canisters empty and weighed them filled with water on our verified shipping scales in the shipping department (yes, the same calibrated scales we used to show you our beefier 6 L canisters only weigh 8 oz. more than the competition). 3 weights were obtained from 3 different scales, like so:

 

2. Measured the volume of water, which came out of the canister (i.e., post weighing).
We only had a 1,000 mL graduated cylinder, so we had to take 3 measurements to get 3L, respectively.
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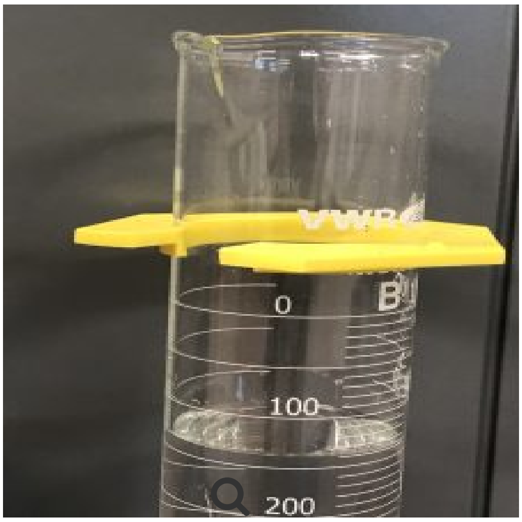
https://blog.restek.com/not-all-3-2-l-air-sampling-canistersare-3-liters-wait-what/



Here are the values we obtained from the aforementioned investigation:

	Canister Mass Empty (lbs.)	Canister Mass Filled w/ H2O (lbs.)	Mass of H2O (lbs.)	Volume of H2O Based on Density (L)	Volume of H2O Measured w/ Graduated Cylinder (L)
Restek 1	2.95	9.25	6.30	2.849	
Restek 2	2.95	9.25	6.30	2.849	2.860
Restek 3	2.95	9.25	6.30	2.849	
Competitor 1	3.05	9.35	6.30	2.849	
Competitor 2	3.05	9.35	6.30	2.849	2.860
Competitor 3	3.05	9.35	6.30	2.849	

As you may see in the above table, approaches 1 and 2 indicate the volume of the competitor's 3.2 L canister is 2.849 and 2.860 L, respectively. These measurements were exactly the same as our 3 L numbers, which for the record are consistent with our internal specifications for min, nominal, and max 3 L canister volumes (i e .,2821, 2853, and 2885 mL). Both approaches agree reasonably well with one another (99.6% agreement).
We speculate the minor discrepancy is the graduated cylinder indicates an accuracy of ±6 mL. With three measurements used, we could have had upwards of an 18 mL swing, so 11 mL is well within limits.
Regardless, both measurements clearly indicate the competitors claimed 3.2 L volume is a far cry away from 3.2 L. Which all makes sense with why our customer saw the competitor canisters filling at the same rate as our 3 L canisters.
Now I find myself wondering what other canister dimensions are not as claimed!? I also wonder why is there a 3.2 L canister on the market anyway? Maybe this is the competitor's approach to excluding others from RFQs (request for quotation).
We do not sell a 3.2 L, so we cannot compete on these quotes, but oddly enough neither does the competition.

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Either a 3L or 3.2L canister won't effect the performance in practice. Both US EPA TO-15 (which is widely adopted by China method HJ759-2015 (and the newly released TO-15A has no specific requirements for 3.2L canister.
The China method HJ759-2015 specifically listed 3.2L is something that's worth considering.
The purpose of advocating an unimportant specification as a must meet requirement is to set up unjust barrier to prevent market competition, which hurts the benefits of userd and other market players.
Ironically, the 3.2L canister is actually Not 3.2L as proclaimed, which makes it not only an unimportant but also quite a meaningless/misleading specification.

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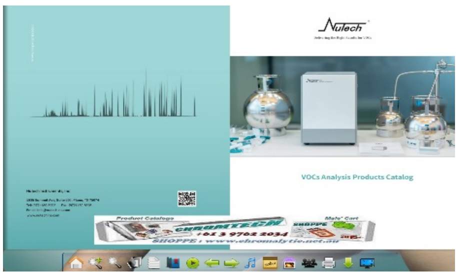

* US EPA METHOD TO-15A (Sept 2019)
Determination of Volatile Organic Compounds (VOCs) in Air
Collected in Specially Prepared Canisters
and Analyzed by Gas Chromatography–Mass Spectrometry (GC-MS)