



Purchasing Considerations for ICP-OES

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Considerations:

- *From an impact, cost, and longevity standpoint, one of the most important lab decisions made*
- *Technology changes rapidly – is your knowledge up-to-date?*
- *Brand loyalty has benefits, but can also pose some limitations*
- *Decision criteria and ranking can produce different outcomes*
- *May have to live with decision for 10+ years*
- *What criteria are you using to make this important purchase consideration?*



Two Camps

1. *New user*

- *First-time purchaser – new lab or a new operator?*
- *May not know what questions to ask, or what all the terms and features mean*
- *Objective, but not as experienced*

2. *Existing user*

- *Experienced, but not as objective*
- *Built in bias*
- *Does operator preference limit employer?*



Observed Hierarchy

Sorted into levels. This does not imply levels of importance, but rather some of the more common considerations I hear

Level 1:

1.Meets *essential* requirements

2.Price

– *Low-bid, bid specifications and justification*

3.Loyalty – user familiarity / preference

Some folks stop here!



Level 2:

4. *Reliability / Service*

- *How often is instrument down?*
- *How responsive and thorough is service?*

5. *Productivity*

- *Samples per hour/day?*

6. *Features*

- *Hardware and software*
- *Viewing orientations*
- *Autosampler type(s), capacity, speed*
- *See or do anything remotely?*
- *Many similarities, but some substantive differences*



Level 3:

7. Operating Costs

- Consumables – torches, nebulizers, etc.*
- Service contract cost*

8. Working Range

- Detection limits*
- High concentrations without need for extra dilutions*

9. Networking / LIMS compatibility

- Importing sample ID, weight, volume, DF*
- Exporting results & pertinent information*



Level 4:

10. Ease of operation and/or training tools

11. Technical Support

- *Level of experience with your sample types/methods*

12. Design

- *Detector type: CCD, CID, PMT*
- *Wavelength coverage – range and completeness*
- *Recombination zone*
- *Plasma efficiency*
- *Torch and introduction system(s)*

13. Frequency and easy of maintenance

14. Planned obsolescence

15. Test “problem” samples before purchasing?



Dig Deeper:

1. Meets *essential* requirements

- *Future needs or growth?*
- *Non-essential requirements – expands opportunities*
 - *Research, method development, environmental, etc.?*

2. Price

- *May not always stuck with the lowest bid*
- *Any trade-in value; allowance for consumables*
- *Use existing consumables as part of purchase price justification*

3. Loyalty

- *A benefit to vendor and to operator(s), but are there any negative consequences to the purchaser?*



Dig Deeper:

4. *Reliability / Service*

- *History / frequency of service visits?*
- *How long can you afford to be “down?”*
- *Can you do any servicing yourself?*

5. *Productivity*

- *High priority for production labs or multiple method users*
- *Less critical for non-production labs*
 - *Longer running times equals more consumption of Argon and consumables and less free time for other activities, so slower can translate to added costs*

6. *Features*

- *More features can add to higher initial and service costs plus more things to maintain, so consider carefully, but it may be better to have a feature and not use it, than to need it someday and not have it?*



Dig Deeper:

7. Operating Costs

- *Compare prices of consumables for different vendors or instruments*
- *Costs can add up over time, but remember to factor in the lifespan*

8. Working Range

- *Detector, wavelength coverage, viewing orientation(s), introduction systems, etc. can impact. What are all the different options you have?*

9. Networking / LIMS compatibility

- *Show them your current import and export files. May already be configurable and/or develop parsers. May have more leverage before you buy than after?*



Dig Deeper:

10. Ease of operation and/or training tools

- Application notes?***
- Videos?***
- Intuitiveness – walk through a complex method set-up with their applications team***

11. Technical Support

- How experienced are they or their clients with your sample types/methods***
- Number of support personnel and/or years of service?***
- User networks?***



Dig Deeper:

12. Design

- *Strengths and limitations of each design*
 - *CCD is fast, but blooming potential; CID doesn't bloom but slower*
 - *Addressing recombination mean more parts to maintain or clean, but not addressing means more potential interferents*
- *Vendors know their instruments well and often their competitor's, so ask lots of questions*
- *Caution: allow company a rebuttal to competitor's comment and decide if it matters*
- *Unique feature – may help with bid specs, but if unsure, ask users/references how often they use*

13. Frequency / easy of maintenance

- *Best source is users*
- *Relative to type and numbers of samples*



Dig Deeper:

14. Planned obsolescence

- *How long has current model been in production?*
 - *Long time is not necessarily bad*
- *Any planned upgrades?*
- *How much longer will current model be supported?*
- *Any new models in the pipeline?*

15. Test “problem” samples before purchasing?

- *If seriously considering, then compare results from different vendors / instruments.*
- *Can you have real or virtual access to an instrument?*
- *Any known references beyond those provided by vendor?*



Suggestions?

1. *List what you like about ICP in one column and what you don't like in another?*
 - *Which column is longer or more impactful?*
2. *Does a different instrument improve upon the things you don't like, without compromising what you do like?*
3. *Priority Ranking*
 - *List evaluation items in numeric order of importance*
 - *Assign a rating score for each item on list:*
 - *Excellent = 1; Good = 2; Average = 3; Fair = 4; Poor = 5*
 - *Multiply order of importance number by rating score, then tally up for a total assessment score*
 - *ICP with the lowest value received the best evaluation*



Conclusions

- *Just the start of a discussion on this topic*
- *Several good ICP options for fertilizers*
- *While many similarities, enough differences to warrant a thorough review and comparison*
- *Technology changes rapidly - is your knowledge current?*
- *Where are you headed – are future plans factor in?*
- *The observed hierarchy may be inverted?*
- *Consider ranking lists or other objective tools?*
 - *Different outcome for different situations*
- *Honesty with your vendor and when serving as a reference helps make informed decisions*
- *Being satisfied with your instrument and vendor is the goal*

