

Automation Design Questionnaire

1. Describe the application – what is the overall function of this product or system (e.g. what does it need to do)?
2. Is this a new application or a replacement product? (If looking for a product replacement, note the shortcomings of the product being replaced.)
3. Technique? (AA, ICP, ICP-MS, UV/Vis, TOC, LC, GC)
4. Markets served?
5. What products will this system compete against? How do we set ourselves apart from the competition? Example: Speed, reliability, number of samples etc...
6. Who are the end users of the system? (e.g. skill level)
7. Description of Operating Environment? (Acidic? Humid? Dirty?)
8. Integrated with other equipment? Size requirements?
9. What are the basic requirements of the system, and which are critical?
 - a) Throughput – Speed of the system?
 - b) Carry over?
 - c) Alignment and calibration requirements?
 - d) Ventilation?
 - e) Size requirements?
 - f) Weight requirements?
 - g) Service requirements?
 - h) EMI Considerations?
 - i) Other?
10. Samples – Reagents – Rinse – (Liquids handled by the system)
 - a. Solvents? (Acetone, methanol, Xylene, Hexane etc...)

- b. Acids? (Hydrochloric, Hydrofluoric, Nitric, and Sulfuric etc...)
- c. Viscosity?

11. Sample Racks

- a. Off the shelf Racks?
- b. Custom?
- c. How many does it hold?

12. Sample bottle/vials.

- a. Sizes (Length, width, height, max OD, ID at opening)?
- b. Volumes?

13. Number of samples needed to be held?

- a. Number samples per rack?
- b. Number of racks?

14. Sample maintenance – Heated and/or chilled (upper and lower limits)? Stirring or mixing of the sample needed?

15. Sample probe – Material, dimensions, septum piercing, porting – anything special needed?

16. Standards-Reagents-Additional liquids – if needed, how many and volume of each needed? (anything outside sample rack)

17. Rinse station?

- a. How many rinse stations are needed?
- b. What rinse solution is needed?
- c. Flow rate of solution?
- d. Is a pump needed to supply liquid to rinse station?
- e. Inside and outside of the sampling needle must be washed and dried between samples?

18. “Pick and Place” (Gripper) Applications:

- a. Tube sizes – examples of each
- b. Tube cap – different caps used? - Examples
- c. Weight of tube with and without sample (Min – Max)
- d. Is it the same tube used through entire process or does it change from sample to sample
- e. Position feedback required?
- f. Tube presence sensing needed?

- g. What is the environment?
 - a. Acids
 - b. Solvents
 - c. Humidity
 - d. Clean/Dirty
 - h. What is the temperature range?
 - i. Ability to sterilize?
 - j. Wash-down and wipe down?
 - k. Is air available?
 - l. Pneumatic application: What is the process impact from air leaks? Will samples be blown around if an air line breaks?
 - m. Sample rack size? Number of samples need to be held by sampler?
19. Computer control – RS-232, USB, Ethernet, Direct control?
20. Software control – Cetac or OEM?
21. Electrical power requirements?
22. Color of system?
23. Screen printing – Anything special needed?
24. Accessories – Syringe pumps, valves- items that either work with the autosampler or controlled by?
25. Certification? Under what regulations and guidelines will this system be validated? CE, FDA, UL, CSA
26. Market window - what is your time frame?
 - a. First proto-type
 - b. To market? In production?
 - c. Any trade shows or special meeting deadlines for a prototype?
27. Anticipated Production Volume:
 - a. Year 1:
 - b. Year 2:
28. Target Retail price?
29. What are the top goals that you would like to achieve with this product?
 - i.e. This project would be considered a success if these goals are accomplished: