

## **FAQ's About Swagelok's NeSSI Submittal**

1. Q: Do you intend to have at any time a system that will comply with SP76/SEMI guidelines – e.g. on the port spacing connections, block dimensions, seal types/dimensions, etc.?

A: Yes. Currently all of the Swagelok components, substrates and downmounts, meet the SEMI standard. It is our understanding that the SP76 standard for the metal seal mimics the SEMI standard.
2. Q: Will Swagelok allow and promote 3rd parties to build components/devices for their manifold?

A: The IGC-II system uses the open architecture of the SP76/SEMI standard for sealing the downmounted functional components of any manufacturer whose device employs the same seal. Swagelok will be working with the manufacturers of components not manufactured by Swagelok to influence them to make their devices available with the SP76/SEMI seal. We do not anticipate licensing third parties to manufacture IGC-II components, that is, flow components, substrate and manifold channels, feet, supports, caps, conversion plates, adapters and miscellaneous hardware at this time. End-users have a number of choices regarding substrate configurations, all compatible with all current downmount components.
3. Q: Have you given any thought on how you could package & heat your manifold system?

A: The NeSSI Information Package pointed out that electrical heating of the sample stream would be preferred. Swagelok has a couple of ways to do that, using cartridge heaters or foil heaters. Swagelok is aware that electrical heating imposes some considerations regarding explosion-proof and/or intrinsic safety. It appears that the question boils down to intrinsically safe individual components or explosion proof enclosure of the entire miniaturized samples system or modular subassemblies of the system. One of the advantages of the miniature modular system approach is that the systems do end up small enough, in most cases, that they should be able to be enclosed in relatively small enclosures or cabinets. Such enclosures or cabinets could likely be a requirement for protection of systems residing in the plant environment at the process line. They could be made explosion proof. Swagelok and other suppliers will need input from end-users, based their applications and safety requirements.

4. Q: Have you given any thought on how you could electrically connect for explosion proof systems? Or supply a standard electrical connection interface.

A: The following three components have power requirements that may preclude the use of intrinsically safe barriers or components:

- Mass flow controllers
- Electric heating
- Solenoid valves

Without the option of intrinsic safety components, the alternative is to use industry standard explosion proof or inert atmosphere type enclosures in a hazardous area. From a wiring perspective, the most efficient architecture for a sample systems housed in an X-proof enclosure would include a single intrinsically safe, digital communications cable transiting the hazardous area between the control room and the sampling enclosure.

This arrangement suggests a number of wiring configurations of the sensors and actuators in the sample enclosure including:

- Multi-drop field bus
- Remote I/O module chassis
- Networked local controller
- Local sensor bus connected to the field bus through a gateway such as an OPC server.

In a system with a large number solenoid valves and hence a large number of discrete I/O points, then depending on the licensing fee structure the DCS system, the idea of local control with an OPC server connection might be the most attractive. This becomes especially if that functionality could be embedded into the analyzer instrument(s).

5. Q: Have you targeted a list of X-proof "electrical" components that could be added to your manifold?

A: Swagelok Co. is in the process of developing such a list. It will be an on-going process. Once again, that list will depend upon how protection in hazardous areas is to be accomplished – intrinsically safe individual components or explosion proof enclosures.

6. Q: How can the flow be measured using your manifold design?

A: Currently mass flow meters. However, there are insertion probes available for certain kinds of light duty industrial service. Part of the effort of the effort at Swagelok will be an on-going effort to research different means of measuring variables using technologies compatible with the miniature modular concept.

7. Q: "C" type metal seals are your basic sealing design. Do you intend to build an elastomer type manifold design to comply with SP76 elastomer standard?

A: Yes

8. Q: With respect to confidentiality do you agree to allow the Swagelok proposal/documents to be distributed to the NeSSI/CPAC distribution lists? (Some of your drawings were marked confidential.)

A: The confidentiality statement on the drawings appears on all Swagelok drawings. The drawings and concepts that were presented in Swagelok's response to the NeSSI request may be shared with all interested parties on the NeSSI distribution list (verified with Dave Simko on 2/28/01)