Automated Manufacturing Systems for ‘State-of-the-Art’ Optical Fiber Preforms

Modular Design
SGC’s standard system configuration has been designed to suit most applications. Because it is a modular design system, gas channels may be removed or added to suit any unusual requirements. Alternative dopants and process gases have been supplied for special systems, and requests for ‘one-off’ specials are welcome. SGC’s extensive experience in this field, together with its ‘in-house’ design and development facility means a unique design and development service, with the assurance of complete confidentiality.

Precise, repeatable control over the flow and composition of the reactants mixture is ensured by using a high precision MFC controllers in conjunction with a purpose-designed bubbler/isothermal bath system. Reagent purity is maintained by using all the PTFE valve blocks and piping, enclosed with an elevated temperature-controlled dry box, and delivery umbilical to the purged PTFE rotary input seal on the lathe. Both the glove box and umbilical are purged with dry nitrogen. All stainless steel systems are also available. PTFE/steel hybrid is standard.

To ensure highest possible standards of quality control, all SGC systems are manufactured in-house (down to component level for proprietary designs of valves, bubblers and tanks etc.)

Advanced PC/PLC Process Control
Fully automated control of the Gas System and Lathe process parameters provide the precise, automated process control necessary for high yield production of today’s highest quality preforms. The advanced, user-friendly PC/PLC control system with touch-screen provides full color data logging of the system status and parameters and a clear, ‘at-a-glance’ overview of the current status throughout the process.

The software may be readily reconfigured for any application and allows the operator to make ‘real time’ adjustments to system parameters during the process using the keyboard and touch-screen, should conditions require it. Network connectivity is available as an option, and the standard preform tube internal pressure control system may be enhanced by the addition of precision continuous tube diameter measurement with closed loop diameter control.

Features & Benefits
- Excellent productivity: 700+ km per preform
- Ideal for multimode and specialty fibres
- Versatile and precise software control of parameters
- Highly reproducible layer thickness and composition
- Highly stable preform straightness and circularity
- Fully configurable, automated process sequences
- Network connectivity
- Totally integrated system design and manufacture
- Superior Gas System integrity maintaining reagent purity
- Complete range of Ancillary Systems
- Guaranteed and demonstrable end-product quality
Accurate ‘Hot-Zone’ Temperature Control
The special design of burner and unique use of a scanning pyrometer enables accurate temperature measurements to be made within the hot zone to ensure tight control over material deposition and fusion rates.

These factors, coupled with the precise control of hydrogen/oxygen flow rates and mixture stoichiometry also allow the use of low flame pressures on the tube and minimize gas usage.

The accurate alignment and high stability of the lathe mechanics and SGC proprietary double chucks used in conjunction with its hot zone temperature control system and automatic pressure control within the tube, all contribute to the excellent preform straightness and circularity essential for the highest quality and yield in fiber production. An optional class 100, laminar flow clean air system and environment enclosure is also available.

Accurate Tube Diameter Control
Improved process control can be obtained by using the SGC tube diameter control system which utilises CCTV with custom image processing, in conjunction with an advanced system for the control of internal tube pressure.

Ancillary Systems
A complete range of ancillary systems is available, including high performance process gas purifiers and dryers, exhaust gas scrubbers and multi-channel bulk reagent storage units with automatic bubbler refilling.

FOCI and SG Controls can offer a complete installation, commissioning and maintenance service in addition to full technical process support and training, including the transfer of all manufacturing technology. Complete ‘Turnkey’ design and construction packages with full end-product guarantees are also available.

Bulk Store and Bubbler Refiller Machine