



BIMESPRO IDS in-situ solution doping system

Introduction & Application

IDS solution doping system is used on MCVD preform lathes for in-situ rare earth-doped preform manufacturing. The advantage of IDS over standard solution doping process is in straightforward fabrication process that does not require removal of the substrate tube from the lathe and its integration with OptiFACT control system. This provides a high level of process automation with excellent repeatability. Further benefit is the possibility to repeat the process, depositing and consolidating several layers one after the other and thus producing a preform with larger active core diameter.

The IDS system is an add-on for a standard MCVD preform fabrication systems. It can be adapted to any type of preform lathe, but as quoted here, it is intended as add-on to Bimes MDS reform fabrication system using MCVD process and OptiFACT software. IDS functions are integrated into OptiFACT software as an additional device with own control screen.

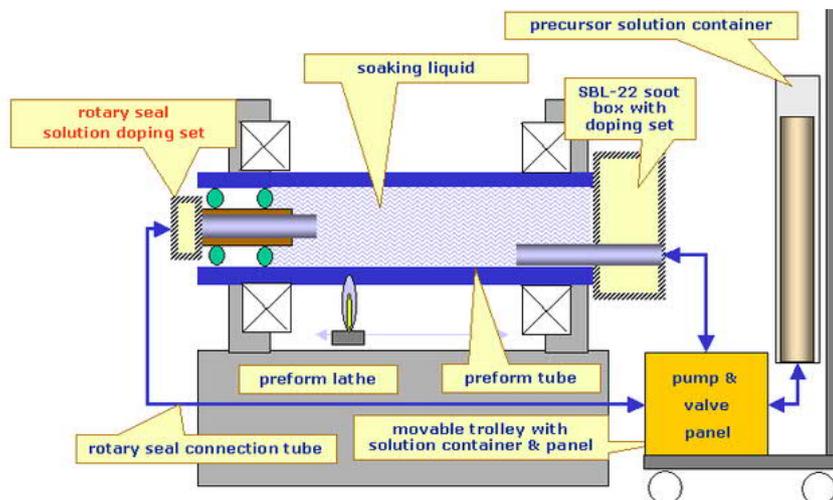
Description

The IDS system consists of the following main components:

1. solution container with suitable volume, connection piping, pump, valves, incl. a stand mounted cabinet with clear view-through door
2. soot box tube solution doping set, to replace standard soot box inner parts and permit filling of the substrate tube by solution
3. rotary seal solution doping set, including special plug and insert for retaining the solution during soaking, permitting complete removal of liquid
4. speed controlled vacuum pump to fill and empty the tube
5. sample recipe and operation manual
6. as option, a magnetic stirrer to keep the solution homogenous, and allow use of suspensions.

Solution doping container is a specially formed glass container with volume adapted to process requirement, equipped with fittings and valves, into which solution with rare earth or other precursors is placed prior to process. Solution is prepared in suitable facility and is poured or pumped to doping container just before soaking process.

After deposition of porous core layers on preform is finalized, preform lathe is set up for in-situ solution



doping process, controlled by a fabrication recipe under OptiFACT control software. Use of recipes guarantee best repeatability of the soaking process.

Rotary seal is equipped with special PTFE plug and conduit to permit complete filling of the tube by solution. It also permits high flow of inert gas to be used to push soot out of preform before soaking, and also to help pushing liquid solution out after soaking process is finalized. This option also works with RSU rotary seal delivered as part of Bimes MDS equipment.

Soot box SBU is partially disassembled, quartz tube filled with soot is removed by carefully sliding it out of the soot box body assembly. Once this tube is removed, a special insert is installed and connected to solution container through the liquid handling panel inside the IDS cabinet.

Liquid is introduced into preform by using a small, clean, and precise electrical dosing pump. Gas exit from preform is controlled through head rotary seal plug.

After soaking time is over, solution is sucked and pushed by gas out of preform back to solution doping container or to drain. When no liquid remains, rotary seal and soot box are reassembled to standard deposition configuration and drying process is started using recipe from OptiFACT control system.