

PDS® Products

P-Type & N-Type Planar Diffusion Sources

Solid Diffusion Sources for the Semiconductor Industry

In today's competitive electronics market, it is imperative to optimize the manufacturing processes. This is especially true in the fast-paced semiconductor industry. Built on the legacy of The Carborundum Corporation, Saint-Gobain's Boron Nitride's PDS® present a cost effective and reliable system for doping silicon wafers for semiconductor fabrication.

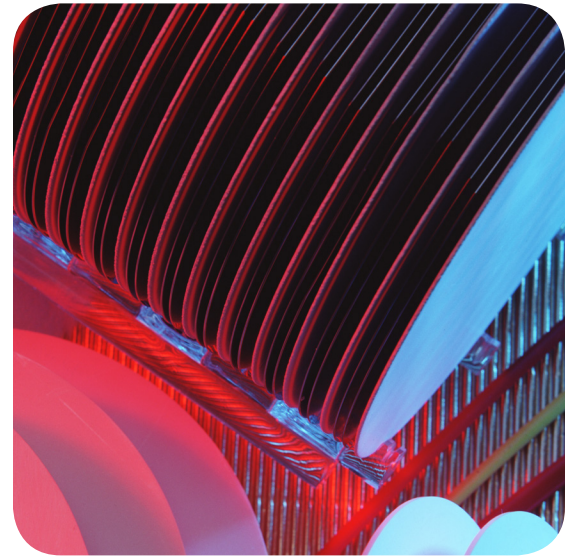
The PDS Products system's ease of set up, excellent control of dopant parameters and reduced maintenance are the product of ongoing research and industry leading technical support to achieve optimum performance of PDS product and the fabrication device.

PDS Products planar diffusion sources allow semiconductor fabricators to replace hazardous chemical dopant such as diborane, phosphorus oxychloride, boron tribromide, phosphine and others, with the PDS Products system.

PDS Products solid sources are placed immediately adjacent and parallel to the silicon wafers. This proximity of dopant source and silicon wafer produces a uniform, defect free diffused layer when compared to other gas and liquid doping systems. Saint-Gobain's PDS Products provide consistent high yields, uniform sheet resistance, reduced defect levels and safety at reduced cost of ownership.

Saint-Gobain Boron Nitride's worldwide distribution channels, ISO 9001 and 14001 certified process and environmental standards, combined with variety of grades for both P-type and N-type PDS Products ensure a defect-free, smooth supply chain for its customers. Backed by industry leading innovation, quality, customer service and technical support from a team of experts with decades of experience, PDS Products are the preferred solid planar diffusion sources for the semiconductor industry.

PRODUCT DATA SHEET



Features/Benefits

- Excellent uniformity enables increased load capacity
- Low defect levels and reduced scrap
- Higher yield and throughput allows for lower thermal budget
- Greatly reduces down time and maintenance losses, cost of tube deglazing and replacement
- Compatible with Automated Transfer Systems
- Simple and efficient control of doping parameters
- Capital-free conversion from carrier gas systems
- Compatible with both horizontal and vertical furnaces
- Easy clean-up of furnace tubes
- Reduced rate of quartz devitrification
- Zero disaster hazard solution-much safer than carrier gas systems

Key Applications

- Analog
- Diode
- Optoelectronics
- Power MOSFETS
- Thyristor
- Power Transistor
- Rectifier

Target Markets

- Semiconductor manufacturing
- Microelectro-mechanical-systems (MEMS)

P-Type & N-Type Planar Diffusion Sources

P-TYPE - BORON NITRIDE

PDS Products grade Boron Nitride, a hot pressed, in-situ, p-type planar source for silicon diffusion, offer an effective low-cost solution. With advanced processing technology using small amounts of hydrogen and oxygen, Saint-Gobain's Boron Nitride sources enable improved yield, reduced cost and trouble-free processing.

Grade	BN-975	BN-1050	BN-1100	BN-1250	BN-HT
Temperature °C	800-975	975-1100	1000-1100	1000-1250	1000-1200
Sheet Resistance (Ohm/Sq)	2000-20	20-5	40-5	40-1.5	20-1
BoronGlass Thickness Å	300-2000	400-1000	200-800	200-1000	200-1000
Dose atoms / cm ²	1.3 x 10 ¹⁴ to 3.6 x 10 ¹⁵	3.6 x 10 ¹⁵ to 1.6 x 10 ¹⁶	2.3 x 10 ¹⁵ to 1.6 x 10 ¹⁶	2.3 x 10 ¹⁵ to 9.0 x 10 ¹⁶	2.3 x 10 ¹⁵ to 4.9 x 10 ¹⁶

N-TYPE - PHOSPHORUS

Phosphorus solid n-type PDS Products incorporates a unique manufacturing technology, combining phosphorus dopant material and an inert silicon carbide substrate. The result is a mechanically stable solid diffusion source.

Grade	PH-900	PH-950	PH-1000N	PH-1025
Temperature °C	825-900	875-950	925-1000	975-1025
Sheet Resistance (Ohm/Sq)	150-15	60-5	25-3	25-3
Boron Glass Thickness Å	100-650	125-1200	175-1200	100-1250
Dose atoms / cm ²	1.4 x 10 ¹⁴ to 3.9 x 10 ¹⁵	3.2 x 10 ¹⁴ to 2.4 x 10 ¹⁵	8.4 x 10 ¹⁴ to 1.1 x 10 ¹⁶	5.3 x 10 ¹⁵ to 1.4 x 10 ¹⁶



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ISO 9001 • ISO 14001