ION IMPLANTATION & DISK REFURBISHMENT

COHERENT

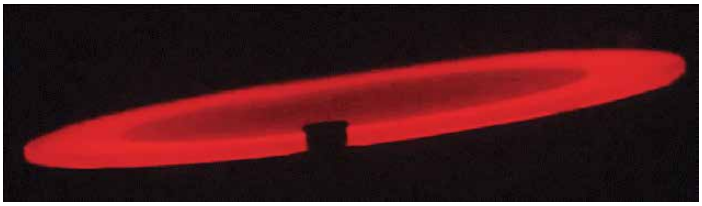
Ion Implantation Foundry

Coherent is a full-service partner, with high quality and reliability, that can support any volume and any type of ion implant demand including:

- Production of full or partial substrate volumes on all common wafer sizes and samples
- From cryogenic to high temperature applications
- Additional support for ion implant process development, production and R&D

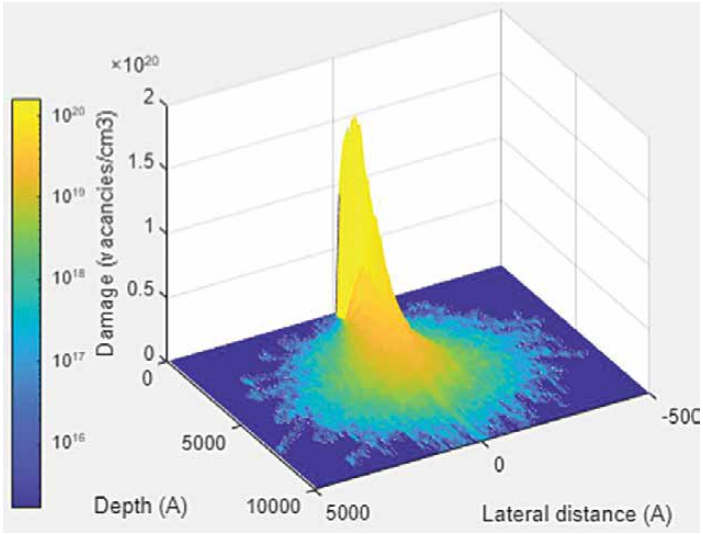
Resource limited and footprint-constrained customers rely on our expertise to:

- Leverage an extensive portfolio of ion implant capabilities including keV to MeV energies, E9 to E17 doses and 0 to 90 degree tilt angles, across the most common species in the periodic table
- Take advantage of rapidly developing and expanding market demands
- Recover from unplanned equipment failures
- Benefit from an expedited turnaround time

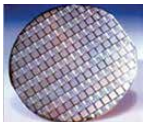
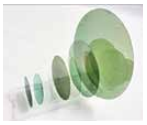


Heated implant services for wide band gap materials

Doping	p-n junctions, bases, emitters and resistors (BJT, drains and sources (MOS, HEMT, HBT)
Damage Engineering	Isolation in EEL and VCSEL, BAW and SAW, P-HEMT and HBT, MEMS
Cleaving	Substrate splitting in Silicon, SOI and SiC, $LiNbO_3$ and $LiTaO_3$



State of the art standard and proprietary implant modeling techniques

	Substrate	Technology	Application
	**Silicon and SOI**	• MOS • Bipolar • MEMS	• Cleaving • Bonding
	**GaAs/InP**	• 3D sensing • Cellular terminals • Lasers	
	**SiC**	• Power • LEDs • IoT, RF, and WiFi • Automotive	• MOSFET • JFET • Diode
	**GaN and Diamond**	• Infrastructure • Defense & Aero • LEDs • Quantum Computing	• HEMT • HPE • RF • NV Centers
	**$LiNbO_3$/ $LiTaO_3$ InSb, HgCdTe ZnSe**	• Optical and acoustic sensors • SAW and BAW filters • Converters	

Largest and most established global ion implantation foundry

Disk Refurbishment Service

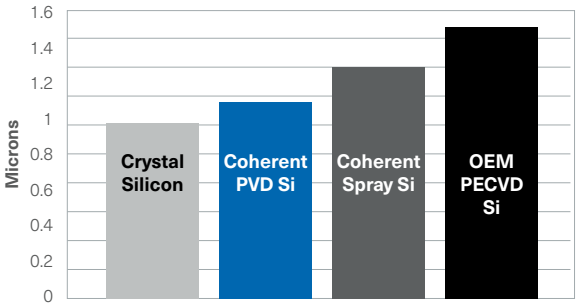
Differentiated ion implant disk and heatsink insert refurbishment

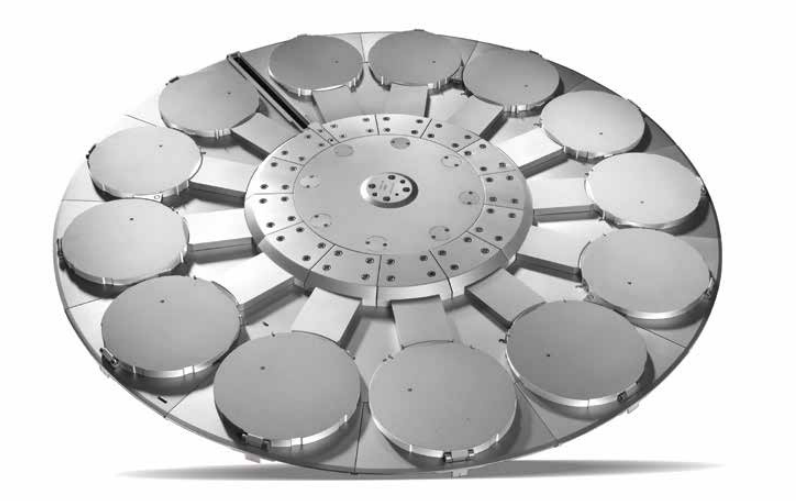
- Protects original capital investment by extending the life of implanters and lowering the cost of ownership
- High quality, field-proven process with attention to detail
- CIP upgrade options to resolve common problems or life-limiting design issues, some resulting in improved yield and/or device performance
- Options to improve reliability and extend compatibility across a wide range of semiconductor substrates including thin-wafer and Taiko ring handling requirements

Industry Leading Innovations

- Meet or exceed OEM specifications
- 2x lifetime improvement
- 99% decreased wafer chipping
- 50% decreased metals contamination
- 80% decreased fence “wear-grooving” particle generation

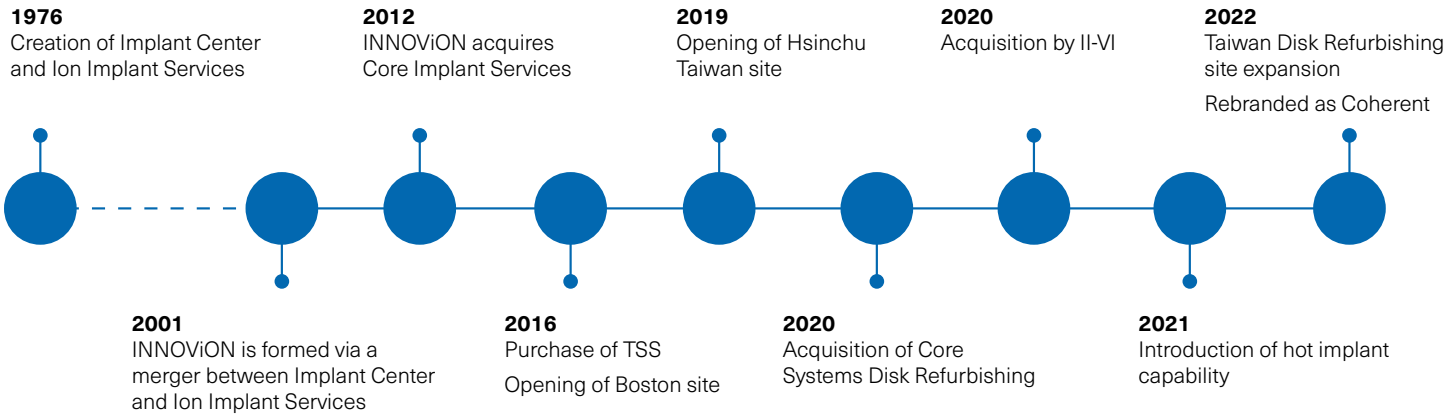
Coherent Si Coating: 36% Wear Rate Advantage



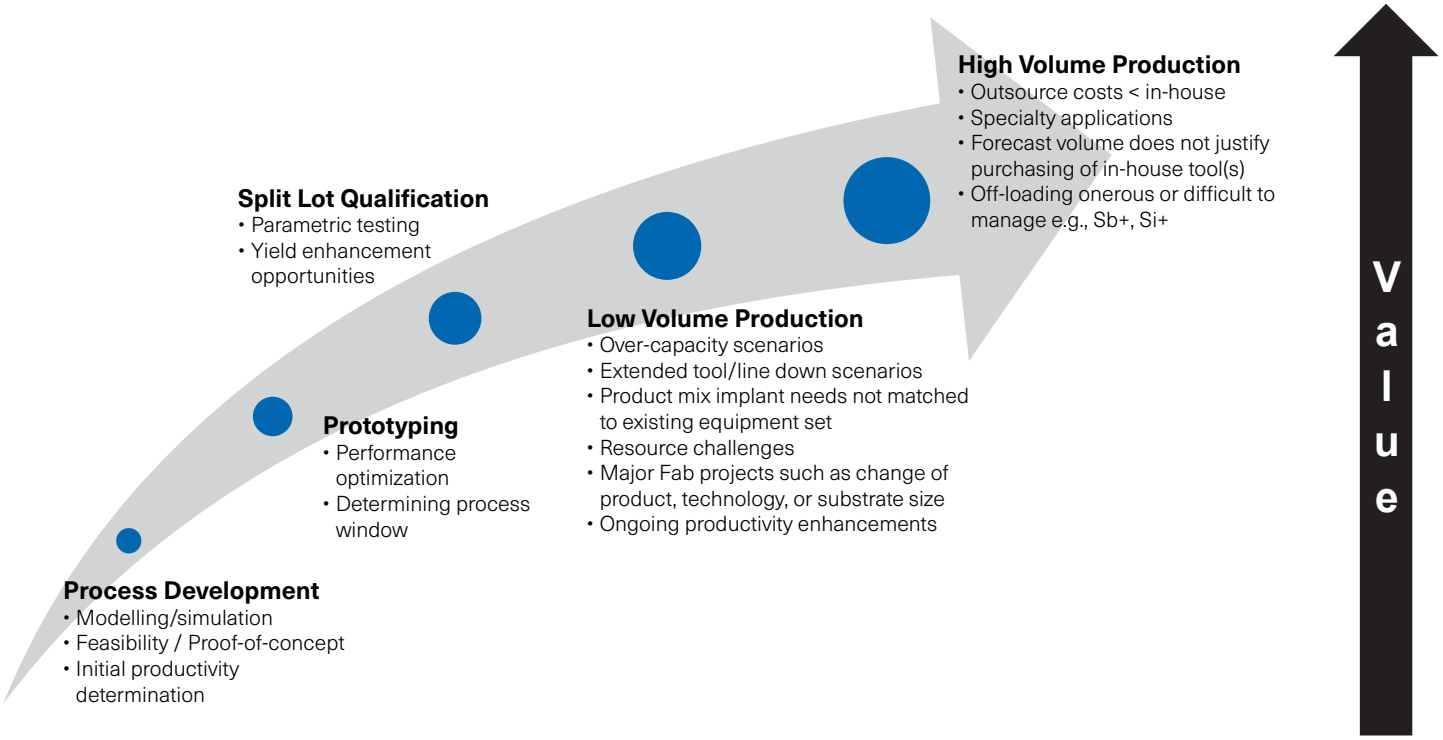


Innovation	Disk Refurbishment Service Advantage
• Low-temperature elastomer pedestal and heat sink coating (standard for GaAs wafers/150 mm)	• Up to 30% increased wafer cooling • Average 30% increased productivity especially slow spin speed; reduced intimate wafer-to-pad contact • Average 85% improved pad-to-pad wafer temperature uniformity
• Torlon fence assembly • Substrate edge protection • Thin wafer support: 200 and 300 mm	• Positive impact on device performance and yield • 100% lifetime improvement fence and disk • 99% decreased wafer chipping • 50% decreased metals contamination • 80% decreased fence “wear-grooving” particles
• PVD silicon coating • Selectable silicon coating thickness up to 35 µm	• 36% increased silicon coating lifetime over OEM CVD silicon coating
• High-precision screw-in bearing fence design vs. OEM crimped position (200 mm disk fence) • Fence gap spec. (pedestal to fence) • Fence positioning spec. (radial center to disk)	• 100% increase in fence lifetime over OEM design • Standard rebuild configuration for 90% of disks • Eliminates asymmetrical fence wear precision placement • Eliminates OEM particle trap (particle gap between fence and fence base) • Reduced potential for wafer chipping
• Fail-safe indexing flag (150 and 200 mm)	• Eliminates false wafer drop error (missing wafer on pedestal flag)
• Paddle finger, low-tension spring • Aspect ratio improvement • Reduced wafer handling force	• Thin wafer handling capability • Taiko ring wafer handling capability • Reduced wafer chipping and wafer breakage
• New 200 mm universal hub disk (UHD) design	• Replacement path for obsoleted OEM component
• UHD coolant inlet manifold machining replacement	• Eliminates a cause for disk scrap; extends asset life

Innovion and Core Systems are now Coherent Corp.



Implant Foundry Services add value throughout the entire product life-cycle



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