

NANOPOL (Vitrified Back Grinding Wheel)

Technology



- Wafer surface roughness and die strength can be improved
- Grinding stress and wafer edge chipping can be reduced
- Diamond at the tip can be distributed consistently
- Porosity, pore shape and pore size control can be adjusted
- Possible to grind Si wafer up to 17 μ m (Ultra thin wafer)
- Outstanding grinding ability for TSV and normal (for finger print) compound wafer

Vitrified Back Grinding Wheel Line-Up

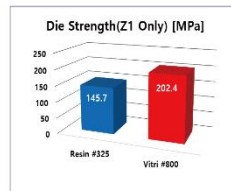
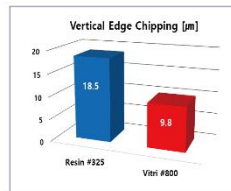
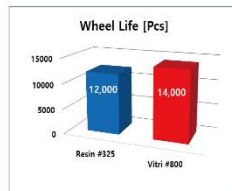
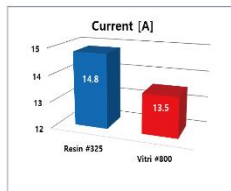
Z1(Rough)				Z2(Fine & Polishing Level)								
#400	#600	#800	#1000	#2000	#3000	#4000	#5000	#6000	#8000	#10000	#20000	#30000
VSZT												
			VNP(SiC, Glass)									
			VSBT(Sapphire, Glass)									
			VSP (LT/LN, Sapphire, EMC Compound)									
				VSPS (EMC Compound)								
						VK8B						
							VK8B (SiC, EMC Compound)					
							VK8HS (EMC Compound)					
								VNP				
								VNP (SiC)				
								VKBT25				

: for Si Wafer

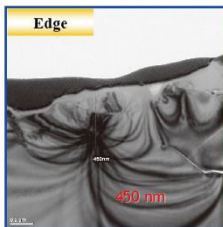
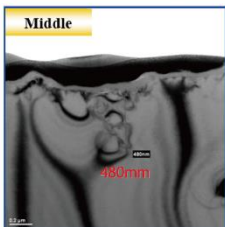
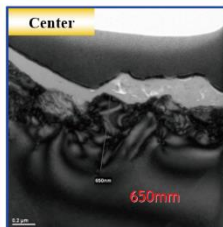
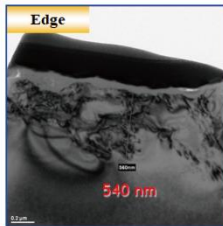
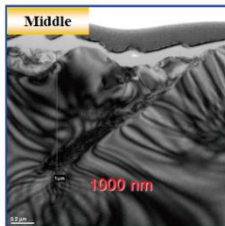
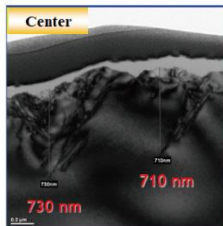
: for SiC, Sapphire, LT/LN, Glass, EMC Compound Wafer

NANOPOL (Vitrified Back Grinding Wheel)

Si Wafer Grinding Z1 Wheel Performance (Machine : Disco 8761)

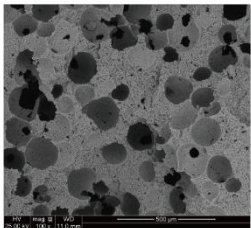
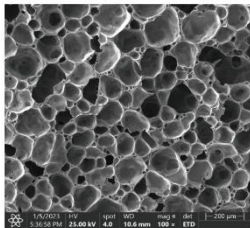


Si Wafer Grinding Surface Damage Layer after Z1 Grinding

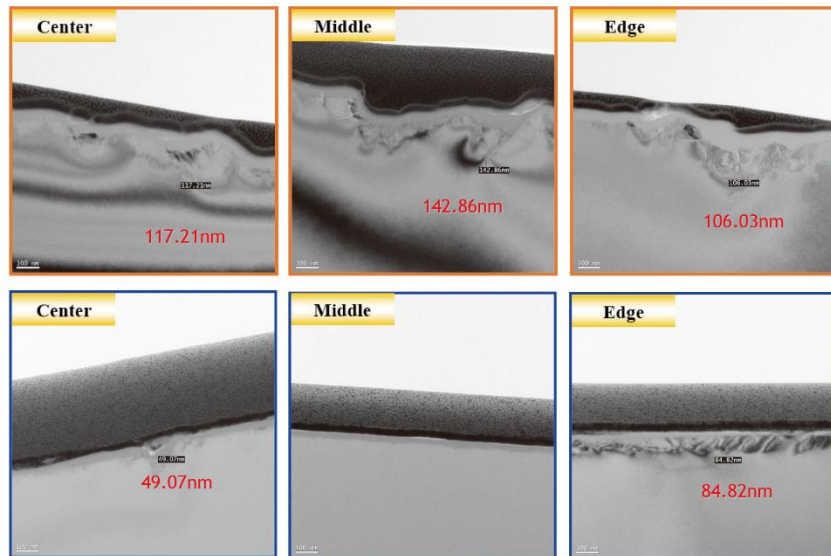


NANOPOL (Vitrified Back Grinding Wheel)

Si Wafer Grinding Z2 Wheel Performance

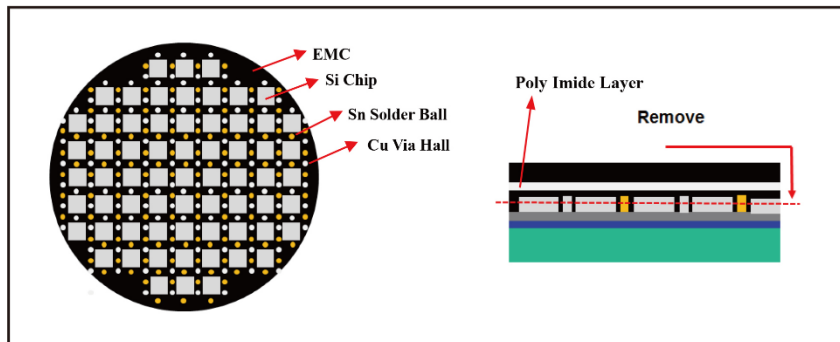
	#5000-VKBT25M3	#8000M-VNP
Grit Size	Mean : $\sim 2.0\mu\text{m}$, Max : $\leq 5.5\mu\text{m}$	Mean : $\sim 0.55\mu\text{m}$, Max : $\leq 1.2\mu\text{m}$
Grinding Current [A] : Disco 8761 Machine	13.5 A (Feed $0.6\mu\text{m}/\text{sec}$)	12.7 A (Feed $0.2\mu\text{m}/\text{sec}$)
Wheel Life [Pcs] : Tip height 7mm	17,000	3,000
Roughness : Wyko Veeco NT9100	Ra : $\sim 4.8\text{nm}$, Rmax : $\sim 56\text{nm}$	Ra : $\sim 1.3\text{nm}$, Rmax : $\sim 15\text{nm}$
SEM [x100]		

Si Wafer Grinding Surface Damage Layer after Z2 Grinding



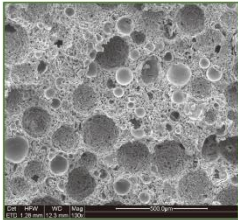
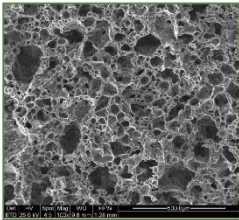
NANOPOL (Vitrified Back Grinding Wheel)

Compound Material(Finger Print Strip) & Compound Molded Wafer (TSV/Fan-Out) Grinding Wheel



Material	Wheel Spec.
Compound (Ex. EMC)	#800 ~ #2000 VSP3, #800 ~ #2000 VSP5
Compound + Silicon Chip	Z1 #800 VSP3 + Z2 #5000VK8HS, Z1 #800 VSP3 + Z2 #5000VK8B
Compound + Silicon Chip + Copper Via	
Compound + Silicon Chip + Copper Via + Polyimide + Solder	Z1 #800 VSP3 + #3000 VSP510

Tip Structure for Compound

	Tip Structure for Si Wafer	Tip Structure for Compound Material
Rough Wheel		
Fine Wheel	