

Wafer grinding: NANOPOL and other tools



Tool contact with a wafer

NANOPOL for wafer and compound processing

NANOPOL is an EHWA vitrified-bond tool family for back grinding. The sources explicitly distinguish silicon wafers from compound wafers. Material structure, required surface finish and processing stage determine the appropriate tool design.

EHWA describes controlled diamond distribution and adjustment of porosity, pore size and pore shape. These features can support surface quality and die strength while reducing grinding load and edge chipping. Selection links the required quality with feed rate, grinding current and useful wheel life.

Applications and process stages

Task	Tool relationship	Important consideration
Rough grinding silicon wafers	NANOPOL Z1 design	Removal, current and surface after Z1
Fine grinding silicon wafers	NANOPOL Z2 design	Roughness, remaining damage and useful life
Grinding compound or moulded wafers	Matched vitrified design	Combination of softer and harder constituents
Grinding moulding material with silicon and metal	Tool matched to the compound structure	Adhesion of polymer, copper or solder constituents

Rough and fine grinding are considered together. The surface left by Z1 establishes the starting condition for Z2. A tool comparison should therefore connect the required result and existing process sequence rather than rely on a single measurement.

Match the bond structure to the material

For silicon grinding, the source describes wear and the exposure of new abrasive grains as part of the working mechanism. Compound wafers frequently contain softer or ductile constituents that can adhere to the tool surface. This changes the requirements for bond behaviour and free-cutting performance.

EHWA presents different wheel structures for these tasks. Bond bridge design and bond content are used to help remove adhering material from the working surface. Useful tool life is deliberately considered alongside grinding ability and finish. The most wear-resistant design is not necessarily the best answer to a compound process in which the wheel becomes loaded.

The documents list several specification families for Z1 and Z2. These remain EHWA tool codes and are not translated into universal grit or bond properties without a manufacturer definition. The complete specification, tool dimensions and actual application provide the basis for selection.

Catalogue example: Z2 on a DGP8761

The silicon wafer document presents two Z2 designs on a DGP8761. The following values were checked against the original page:

Reported measurement	5000-VKBT25 design	8000M-VNPSSR design
Feed rate	0.6 $\mu\text{m/s}$	0.2 $\mu\text{m/s}$
Grinding current	13.5 A	15.5 A
Useful wheel life	23,000 pieces	4,500 pieces
Ra roughness	approximately 4.8 nm	approximately 1.3 nm
Rmax roughness	approximately 56 nm	approximately 15 nm

Source: NANOPOL silicon wafer document, original PDF page 9. Roughness is reported using a Wyco Veeco NT9100. The designs have different specifications and feed rates. The table illustrates the relationship between finish, operating conditions and useful life; it is not a comparison under identical conditions or a setting instruction for other machines.

Selection begins by establishing the required finish and available processing time. A suitable design can then be discussed in relation to the existing stages and material structure. For compound wafers, the tendency of constituents to adhere to the wheel is an additional selection factor.

Discuss your grinding task with EHWA

Provide the wafer material or compound structure, diameter, initial and final thickness, machine and existing Z1/Z2 tools. Feed rate, grinding current, surface measurements and wheel life support the comparison. Start with the information already available and use the technical discussion to develop the remaining details. The goal is a tool design linked to a defined surface requirement and a workable manufacturing process.

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[Request tool selection](#)

Sources and original documents

- [EHWA: NANOPOL for compound and silicon wafers](#) · PDF pages 1-10; Z2 example: page 9.
- [EHWA: NANOPOL Compound Wafer Grinding Wheel](#) · PDF page 1.
- [EHWA: NANOPOL Si Wafer Grinding Wheel](#) · PDF page 1.
- [EHWA: NANOPOL Semicon document](#) · PDF pages 1-4.