

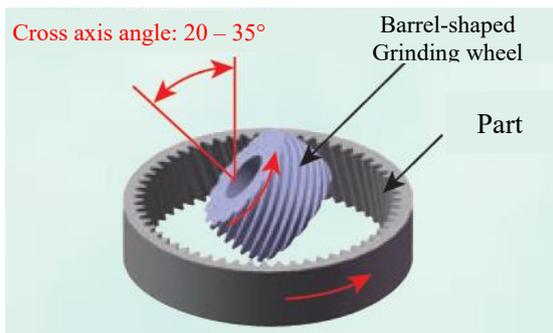
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Nidec Machine Tool Develops the World-first Internal Polishing Process for Mass-production
- For the Quality Improvement of EV, Robot, and Other Gears -

Nidec Machine Tool Corporation (“Nidec Machine Tool” or the “Company”), a group company of Nidec Corporation, today announced that **it has developed the world’s first high-accuracy internal polishing process for mass production**. It can finish ring gears in planetary gear sets that are used for automobiles’ transmissions and for robots’ joints. Gear polishing was well established for external gears in mass-production, but for internal gears, it was still in the development level. After conducting research focused on this point, the Company has achieved positive results to secure the level of accuracy with high productivity for mass production, which could not be obtained by conventional internal grinding, honing, or skiving process.

Planetary gear reduction mechanism can provide a higher transmission ratio in a significantly more compact and lighter package, and a positive effect on the efficiency. For this type of gears, even the slightest geometric distortions in the ring gear lead to unwanted noise, vibration and negative influence to durability, efficiency. The demand of high accurate gears is increasing by electrification of automotive and automation for manufacturing. The Company has realized the development of this new finishing method can satisfy demand and improve gears’ durability, transmission efficiency, and NVH (noise, vibration, and harshness) performance.

Through this latest R&D project, machining process evaluation was conducted by Nidec Machine Tool’s gear grinding machines and technologies. This project is part of the joint research with RWTH Aachen University, Germany. For more details on the project, please see the dissertation attached hereto.



Process principle of internal generating grinding



ZI20A, an internal generating gear grinder for mass production

Processing machine: ZI20A, the internal gear grinding machine developed by the “Company” with unique technology and launched in 2009, was used. This machine can satisfy high accuracy and high productivity for mass production application.

Selection of polishing wheels: Polishing wheels were selected through preliminary assessment by evaluating their availability in the market, economic efficiency, and suitability for mass production application.

Definition of machining conditions: The target surface roughness was set to Ra0.1 μ m and Rz1.0 μ m or less as a general surface roughness requirement for polishing. The high-efficiency process conditions that can keep geometry accuracy, ISO class 3 to 5, without grinding burn were defined.

With its world-leading gear-machining technology, Nidec Machine Tool provides machines, tools, and machining solutions to stay committed to contributing to solving social issues.

Dissertation: “Application-oriented research on internal generating polishing”

For more details of the above product, please contact Nidec Machine Tool Corporation at +81-77-552-9768. Thank you.

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