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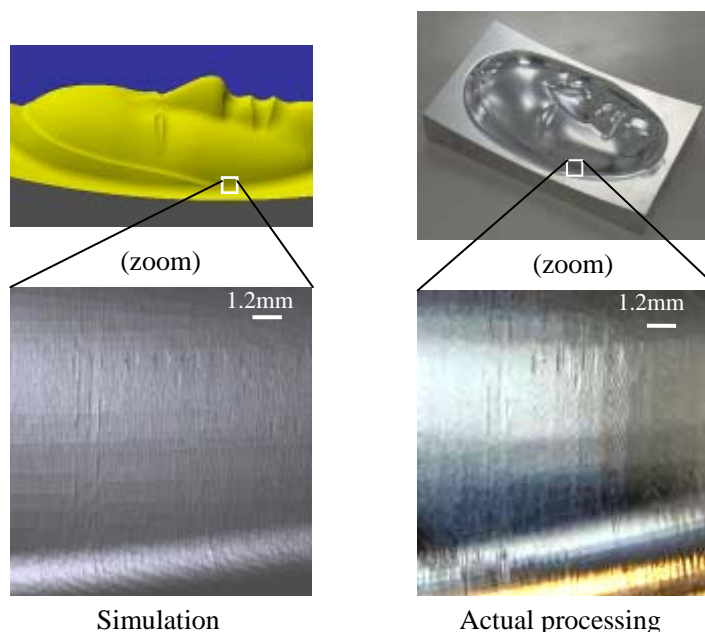
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## **Mitsubishi Electric Develops Ultra-High Resolution 3D Shape Representation Technology**

*Operators can evaluate surface textures without conducting high-grade processing tests*

**TOKYO, February 12, 2013** - [Mitsubishi Electric Corporation](http://www.mitsubishielectric.com) (TOKYO: 6503) announced today it has developed ultra-high resolution 3D shape representation technology for numerically controlled (NC) machine tools. The technology displays detailed shapes of machined surfaces down to a resolution of 1 micrometer (um) in a 3D machining simulation, which machine operators can use to evaluate surface textures without trial cutting through a high quality machining process.

Surface Quality of Simulation Versus Actual Processing



### **Key Features**

**1) Ultra-high-resolution reproduction of processing**

- Displays changes in shape by cutting to a resolution of 1 um
- Possible to check for over- or under-processing marks, scratches, etc.

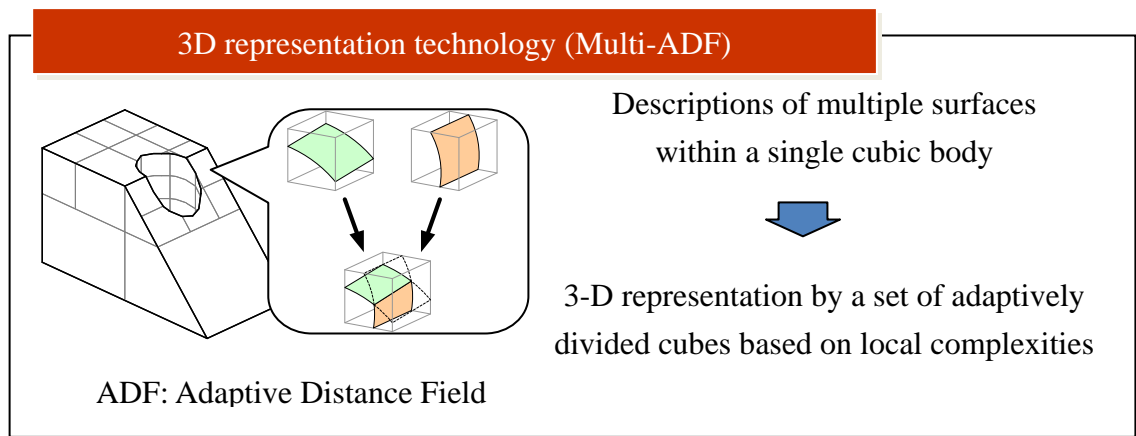
**2) Highly manageable ultra-high-resolution 3D simulation data**

- Complex shapes are displayed with limited data using Mitsubishi Electric’s unique Multi-ADF (adaptive distance field) shape-representation technology
- Runs fast thanks to vastly reduced (less than 1/100) data storage compared to conventional high-resolution 3D simulations.

	Features	Resolution	Required memory size (In the case of the sample shown in the figure above under the same condition of 1 um resolution)
New	Simulation-based evaluation of processed surface properties	1 um	Less than 50 MB
Old	Simulation-based shape evaluation of processed material and operations	0.1 mm	Approx. 16 GB in theory

**Multi-ADF**

The 3D representation of multi-ADF proprietary technology developed recently by Mitsubishi Electric uses less than 1% of the storage capacity required by conventional, high-resolution geometric model resolutions at the 1 micron level. Multi-ADF represents 3D shapes with a set of tiny cubes each with refined descriptions of multiple surfaces on them. This technology makes it possible to display dents and scratches on machined surfaces down to a resolution of one micrometer using fewer cubes, allowing high-speed simulations that require little memory.



**Development Background**

In recent years, the mold processing sector has pursued ways to reduce time by using high-precision, high-quality machining methods that do not require polishing. Further, direct processing is being used increasingly instead of die-mold production, which has raised the demand for high-quality finishing by cutting.

Cutting devices are controlled by machining programs generated by computer-aided design (CAD) and

computer-aided manufacturing (CAM) programs. Actual machining tests are normally done to verify the integrity of machining programs. This requires a lengthy process of repeated trial cutting to confirm that high-precision and high-quality machining results are achieved.

Mitsubishi Electric's new technology enables high-precision, high-definition finishing by simulating 3D machining, which leads to more efficient production by permitting operators to evaluate surface texture outcomes, as well as by eliminating the need for tests of actual high-grade machining.

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### **About Mitsubishi Electric**

With over 90 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 3,639.4 billion yen (US\$ 44.4 billion\*) in the fiscal year ended March 31, 2012. For more information visit <http://www.MitsubishiElectric.com>

\*At an exchange rate of 82 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2012