

Chiba Prefecture

Yamamoto Scientific Tool Laboratory (Funabashi City)

The world-only specialist of manufacturing standard blocks for hardness with excellent precision, good enough to be certified by ISO and JIS

Kaken Geneqs Inc. (Matsudo City)

Developer of microarrayer for composing DNA/protein microarray chips

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of manufacturing
standard blocks for
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Yamamoto Scientific Tool Laboratory

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Established on 1952
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Takashi Yamamoto
President

Yamamoto's standard blocks are made of custom-made flat steel by heat treatment: the blocks are processed so uniformly that the hardness of overall surface is even. The blocks have been used for various industrial tests for hardness in the world, holding 95% market in Japan.

Standard blocks as the practically global standard

Based on its researches on metal engineering and heat treatment for over 60 years, Yamamoto Scientific Tool Laboratory has manufactured over 130 types of standard blocks for hardness available for loading between under 10 grams to over 3 tons.

Yamamoto's standard blocks with excellent uniform hardness have been practically used as the global standard: ISO standards have adopted the blocks as the common standards for hardness evaluation.



High-precision standard blocks for hardness

The results of hardness tests are always given to the manufacturing site

Yamamoto has tested all of its products with its own hardness testers whose quality is on the best level in Japan: it is strength for Yamamoto as the test results are always available for the manufacturers to improve the quality of standard blocks. Sticking to its motto "product quality will never improve without feedback," Yamamoto has contributed to the development of Japan's industries including steel, shipping and machine. On 2000, Former President Hiroshi Yamamoto received the Fifth Order of the Sacred Treasure by the Science and Technology Agency, for the contribution by the company.

Yamamoto's contribution to the development of metal material in various industries

In the laboratory in Chiba, Japan, 20 workers of Yamamoto have been manufacturing standards blocks adopted worldwide for hardness tests applicable from bottle caps to metal strength of airplane. With supports from its various partners, now Yamamoto has been developing standard blocks for nanoindentation hardness test, as well as standard blocks for microstructure (Group 7: abnormal microstructure).



Standard blocks for microstructure



Hardnester

**Developer of
microarrayer for
composing DNA/Protein
microarray chips**

Kaken Geneqs Inc.

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Hirokazu Yoshioka
President

Kaken Geneqs, the pioneer of DNA chip composing, has commercialized the first microarrayer for protein chips in the world, in the trend that analysis of protein has become widely noticed.

Analysis of protein functions is expected to be major next to genom

It is expected that the mainstream of biological research will be the analysis of protein functions, as the analysis of human DNA has been advanced. Similar to DNA chips that are widely used now, therefore, microchips for protein analysis are needed to analyze a mass of protein at the same time. Protein microchips should be composed of thousands or ten thousands of protein spots arranged evenly on a substrate.

Confronted difficulties for composing protein microarray chips

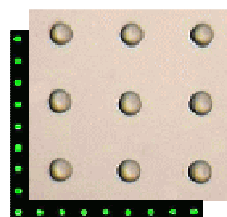
Unlike DNA microchips, it was regarded that protein microchips were practically impossible to compose because protein is (1) easier to deteriorate and degrade, especially accelerative in the delicate condition on chip, and (2) varied as many as 300,000 types and composed of so complicated 3-D structure that the spots should be ultra-precision.

Solution of difficulties by the application of robotics

Kaken Geneqs Inc., the expert in application and development of robotics for many years, has utilized its original manufacturing method and know-how based on mechatronics to solve the difficulties aforesaid. Microarrayer, the microchip composer available for both DNA and protein, was realized by Kaken's efforts, including the development of epoch-making screwpins and by joint research with Prof. Irimura of the Graduate school of Pharmaceutical sciences of the University of Tokyo. On 2005, Kaken was awarded with the grand prize for the development of microarrayer at the first MONODZUKURI Awards.



Microarrayer for DNA/Antibody/Protein



Realization of spots with even diameter
and excellent reproducibility