Oita Prefecture

Teikoku-Carbon Industry Co.,Ltd.　(Oita City)

Slinder for pantograph of a train with self-lubrication function

DENKEN Co., Ltd. (Yufu City)

Development and Manufacture of Optical Modeling Devices for Universities and Other Educational Institutions

Contact strips for pantograph of a train with self-lubrication function

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Iwao Azetsu
President

The company obtains 40% of the domestic share through development of high-performance sintered metals with self-lubrication function that include metallic and nonmetallic lubrication materials.

“Contact strips for pantograph” whose abrasions are remarkable

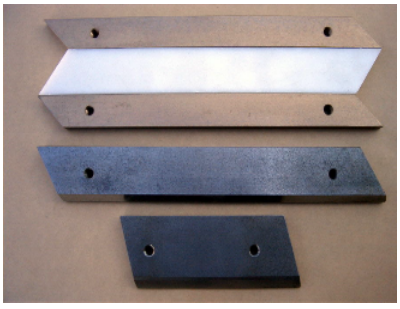
In the midst of progressing of speeding up of Shinkansen lines, conventional railway lines, and private railway lines, contact strips for pantograph is exposed to remarkable abrasions since
frictional resistance with electric wires increases. Thus, endurance becomes an issue. Also, it is necessary to engage in adoption of unleaded substances in terms of considerations of environmental problems, etc.

High-performance sintered metals (Product name: Tecoraiza)

Tecoraiza is high-performance sintered metal. This is manufactured by mixture of several types of metal powders and nonmetallic powders including refractory metals. Subsequently, the processes of molding, sintering, machining, and oil-bearing apply. Tecoraiza includes metallic and nonmetallic lubrication materials. Simultaneously, “self-lubrication function” is enhanced through using of the unlimited number of pores and performing of impregnation of lubricating oil. Due to this, abrasion resistance is superior and the quality is even through the company’s unique processes. The amount concerning heat value and power loss is small. Therefore, Tecoraiza generates high outcomes as contact strips for pantograph of trains.

The company has 20 patent rights or more through progressing of improvement of sintered alloy and obtains 40% of the domestic share

Teikoku-Carbon Industry Co.,Ltd. has sequentially advanced the improvement of Tecoraiza since the adoption of Tecoraiza as contact strips for pantograph of trains of Japanese National Railways in 1961. At present, the company has 20 patent rights or more. Additionally, in 2003, due to highly advanced technologies, such as success in development of new products with significant prolongation of life considering the environment through using of the unleaded substances, the company obtains 40% of the domestic share concerning contact strips for pantograph of trains used by the JR companies and private railways.



Contact strips for pantograph (Tecoraiza)

700 Series Nozomi Line train that adopts Tecoraiza

Development and Manufacture of Optical Modeling Devices for Universities and Other Educational Institutions

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Shiro Ishii
President

The company develops optical modeling devices that create three-dimensional model based on 3D data in cooperation with TLO of the University of Tokyo and obtains 70 - 80 % of the domestic share for educational institutions and medical institutions.

Optical modeling technologies created in Japan

Optical modeling technologies that create a three-dimensional model according to practical application and dissemination of 3D-CAD, 3D scanner, and 3D-CT medical data, were proposed by Hideo Kodama at Nagoya Municipal Industrial Research Institute in 1980. And optical modeling device was developed as the “mockup technologies at the era of digital design” in 1987. DENKEN has developed desktop type compact optical modeling device based on semiconductor laser as a light source, ahead of other counties in the world since 1992. And in regards to the dissemination of technologies, DENKEN has contributed to small and medium-sized enterprises, Industrial Technology Centers, universities, colleges of technologies, engineering schools, and polytechnic colleges throughout Japan, as an output plotter concerning industrial art design model prototype and 3D-CAD.

Optical modeling device that creates a three-dimensional model based on 3D data

Optical modeling device enables easy creation of a complicated shape model that could not be realized through the previous cutting work operations, etc. Such device is used for the purposes of creation of a prototype model for industrial products and an industrial arts model such as a complicated hollow shape model, and a biomedical model, etc. And this device has been rapidly disseminated as the manufacturing technologies using the computers.

Optical modeling device: SolidJet

In June 2000, in cooperation with Center for Advanced Science and Technology Incubation, Ltd. (the present TOUDAI ＴＬＯ,Ltd.), DENKEN developed a “sol-gel transformation stereolithography system: SolidJet” jointly with Associate Professor Tamotsu Murakami Graduate School of Engineering, University of Tokyo.
SolidJet can extract a biologic organ model of a patient based on the hospital CT data in addition to an industrial art design model. Therefore, the adoption of SolidJet regarding medical institutions as well as university hospitals has been progressed. SolidJet attract increasing attention as a “biomodeler.” SolidJet is exported to Korea and Taiwan in conjunction with other models. And DENKEN has made the highest achievement concerning delivery of the product in Japan, for educational institutions and medical institutions, such as polytechnic colleges, universities, and technical colleges.

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Solidjet SJ-200P

Three-dimensional model