Sanalloy's cemented carbide the hidden linchpin of many industries

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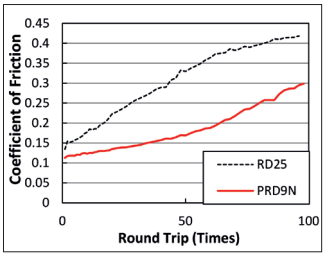
Sanalloy is leveraging its expertise to develop next-generation cemented carbide products to meet the demands of ever-changing industries.

"We focus on quality first, not business."

Seiji Yamamoto, President, Sanalloy Industry Co., Ltd.

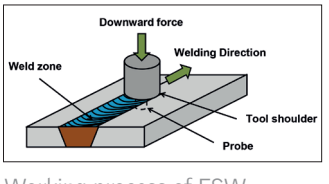
Founded in 1963, initially as the Sanyo Alloy Research Institute, the Japanese company Sanalloy is a leading specialist in the production of cemented carbides – heavy metal alloys whose hardness is second only to that of diamonds. Cemented carbides are the ideal material with which to create the cutting, drilling, molding and welding tools used in a range of manufacturing industries, and Sanalloy's extensive portfolio of clients – both in Japan and abroad – includes automobile, aircraft, electronic appliance and steel producers. "Our customers are companies involved in advanced industrial production, and are all companies that demand a high level of quality, both domestically and internationally," says President Seiji Yamamoto.

Based in Fukusaki, Hyogo Prefecture, Sanalloy not only adheres to a strict quality commitment – "it's our highest priority," Mr. Yamamoto says – but is also dedicated to remaining at the cutting edge of its customers' ever-evolving industries. For example, the rise of electric vehicles (EVs) in the automobile sector has prompted the firm to develop its P Series of cemented carbides, which are better suited to working with the lighter materials used to make EVs.



Coefficient of friction for copper alloy

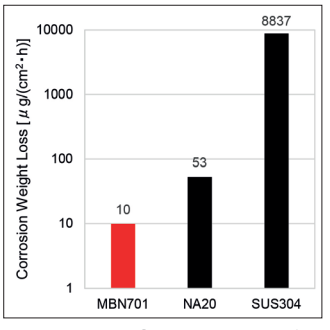
"Copper and aluminum alloys, which are lightweight new soft materials, have problems such as easy surface adhesion when cemented carbide is used in the manufacturing process, due to their high affinity with cobalt and nickel, the binding metals of cemented carbide," Mr. Yamamoto says. "The P Series has a reduced coefficient of friction without compromising conventional mechanical properties, and has excellent resistance to seizure and wear against soft materials. A lower coefficient of friction suppresses the frictional heat generated during machining, and thus suppresses seizure." He adds: "The P Series is a hard material, yet resistant to chipping. Conventionally, when a material is hard, it cracks easily; the P Series is a product that combines the properties of being hard but resistant to cracking."



Working process of FSW (Friction Stir Welding)

Sanalloy's dedication to innovation has also led it to create the FSW7 cemented carbide, which is specifically designed for tools used in friction stir welding, a ground-breaking method of welding that harnesses friction to join two metal components, rather than having to melt them together. "Our FSW7 cemented carbide for friction stir welding tools has excellent rigidity, wear resistance, oxidation resistance and seizure resistance at high temperatures," Mr. Yamamoto says.

Another state-of-the-art Sanalloy product, TNE40, is an example of the company's willingness to diversify from its core business to meet customers' varied needs. A cermet rather than a cemented carbide, it provides particularly effective heat resistance. "We conducted a test to measure the rate of weight change before and after leaving a tool at 900°C for one hour," Mr. Yamamoto says. "The weight change rate of cemented carbide after the test was 111%, whereas that of TNE40 was 100%, showing almost no oxidation. This indicates it's an alloy with excellent oxidation resistance and is suitable for wear-resistant applications at high temperatures."



Comparison of corrosion weight loss of hydrofluoric acid aqueous solution

The MBN alloy is also representative of Sanalloy's ability to branch out. "Plastic products are used in various industrial fields such as automobiles, home appliances, office automation equipment and medical care, and many are mass-produced by injection molding," Mr. Yamamoto explains. "Especially in the injection molding of fluoroplastics, resins containing hard particles, etc., high corrosion and wear resistance are required for parts used inside machines, but there was a history of corrosion and wear progression even in our NA20, which is one of the most

corrosion-resistant cemented carbides. To meet this demand, we developed a new corrosion and wear-resistant alloy, the MBN alloy, which is completely different from cemented carbide, and succeeded in its mass production."

Despite Japan's declining population, Sanalloy's domestic sales are rising, Mr. Yamamoto notes. Business is also on the up internationally, and the company is committed to an ongoing process of global expansion. "We have overseas sales and production bases in Asian countries such as South Korea, Thailand, Malaysia and China," Mr. Yamamoto says. "Currently, policies linking the economy and security of each country are emerging, and we plan to expand our sales and production bases in accordance with the policies of each country. As regions that we'll place particular emphasis on in the future, we're focusing on North America and India."