
Preface

Expectations for Powder Metallurgy Technology



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In the industrial world, it goes without saying that “manufacturing capabilities” are the key to the success of a company. From my own experience of more than 40 years since joining the automobile industry, I feel that the most basic part of these “manufacturing capabilities” is technologies related to materials and Sokeizai (near-net shaped products). As a distinctive feature of these technologies, I have also recognized that time and hard work (effort marked with the “blood, sweat, and tears” of engineers) is necessary in accumulating these technologies, and simply copying a technology is no easy matter. At the same time, the importance of collaboration between companies, and not merely between specialized departments in a company, in improving these “technical capabilities” is self-evident.

In comparison with technologies like IT and electronics, this technical field is definitely not glamorous and does not appeal to popular tastes. This means that engineers and researchers must have tremendous passion and a sense of mission if technical improvement is to be achieved.

Although the scope of material/Sokeizai technology is wide, powder metallurgy technology can be considered part of plastic working technology, like hot and cold forging, rolling, and similar processes. As is well known, the fundamental elements of plastic working, which also includes powder metallurgy technology, are materials technology, die design and fabrication

technologies, process design technology, lubrication technology, and equipment technology. Improvement of these fundamental technologies is the challenge for engineers and other technical people in the field of plastic working.

Here, I would like to touch briefly on the mutual relationship between the automobile technology, in which I work, and powder metallurgy technology. Freedom in producing various shapes (near-net shape technology) is a distinctive characteristic of powder metallurgy. Taking advantage of this feature, powder metallurgy products are used in pulleys and sprockets for engine valve drive systems, in synchronizer hubs for transmissions, and other components. Freedom in combining materials is another important feature of powder metallurgy, and has made it possible to develop engine valve seat inserts and guides which have been adopted in the automobile industry to cope with increasingly severe service conditions. For example, thanks to this technology, it was possible to respond to the introduction of unleaded gasoline. Recently, many automakers have been grappling with variable valve timing as an environmental technology, and parts produced using powder metallurgy technology have become indispensable in the mechanism used in these systems.

The fact that Hitachi Powdered Metals Co., Ltd. occupies a firm position in the powder metallurgy

industry is proof of the company's high level in the various fundamental technologies mentioned above, and is also a result of anticipating needs in automotive technology and other technologies and responding proactively to the requirements of users.

One challenge for industry in the future, including the automobile industry, will be how to cope with environmental problems. Accompanying this, there will also be many challenges for powder metallurgy technology. Powder metallurgy engineers and researchers are already identifying these issues and carrying out development work. For example, the response to environmental problems in sintered parts include such issues as further near-net shape production, which means developing undercut techniques, minimizing deviations in the thickness dimension, and weight reduction. In solving these problems, technical development will be necessary, including the development of new chemical compositions of raw materials, more accurate methods of

weighing materials, dies and other equipment with minimal deformation, and other element technologies. In other words, in meeting this challenge, breakthroughs in the fundamental technologies mentioned previously may be necessary.

It is my hope that all of the powder metallurgy engineers at Hitachi Powdered Metals will delve deeply into the fundamental technologies for which they are responsible with tenacious passion as they work to develop these technologies. I also hope that all of Hitachi's technical people will deepen their collaboration with other related technologies, improve their total capabilities, and maintain a firm grasp on the desires of users. If the company does this, it will continue to lead this industry, and as a result, will build an unshakable position in the Sokeizai industry.