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## Preface

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**Hiroshi Fujinami**  
President  
Hitachi Powdered Metals Co., Ltd.

Although this is only the fifth Issue of Hitachi Powdered Metals Technical Report since we began publication, some of the technologies introduced in the past are already in mass production and are making important contributions to the company's sales.

For example, the pulley inner hub of use in car air-conditioner compressors, which was introduced in the previous issue, functions as a mechanical fuse in the compressor and is the world's first sintered part in this application. This product not only realizes high functionality in compressors, but also makes a significant contribution to compact design, weight reduction and cost reduction. Because unprecedentedly high level of performance is required in this product, we made every possible effort to stabilize product quality in both the material and production technology aspects and have expanded production by establishing an extremely high mass production technology.

In the future, the creation of new products with high added value by realizing more advanced technologies, as in this case, will become increasingly important.

One example of this is products which apply magnetic materials utilizing the strengths of powder metallurgy and this company's materials and production technologies. Taking advantage of the trends toward electric vehicles, energy saving in general industrial equipment, and other technologies which respond to environmental problems, a large expansion in the range

of applications is expected in the future.

Hitachi Powdered Metals is also engaged in innovative research and development aimed at creating new fields and new products in mechanical parts, bearings, chemical products and other areas, which are expected to make a major contribution to expansion of the company's scope of business and growth.

Because this Preface was written during summer vacation, I was frequently reminded of summer homework in my childhood.

While writing, I happened to recall arriving at Dayton Airport in Ohio on a business trip to the United States several years ago. Because Dayton was the home of the Wright Brothers, a replica of the airplane which they invented is displayed in the airport. When I saw it, I remembered reading a biography of the Wright Brothers as a child and I was stirred with emotion.

When I was a child, book reports on biographies of famous people were a standard item in our homework during summer and winter vacations. There were biographies of inventors, discoverers and politicians, beginning with Sontoku Ninomiya, and also including Hideki Yukawa, Hideyo Noguchi, Lincoln, Edison, the Wright Brothers, Madame Curie, and others.

In my case, it would seem that there were many biographies of inventors.

Since this was quite a long time ago, my memory is unclear, but the biographies of the day seemed to have a

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set pattern with period background. The heroes were definitely not from a privileged environment, but they succeeded because they were blessed with good fortune and worked harder than other people.

In particular, one thing that these biographies of inventors had in common was the fact that the inventors continued resolutely with their challenge, in spite of repeated failures and succeeded when they met some unexpected good luck. In these impossibly large successes, we felt that incalculable effort and a combination of accident and necessity led to great results.

With Edison's electric light bulb, the problem was to keep the bulb lighted for a long period of time. Edison solved this by using a carbon filament made from Japanese bamboo. On the other hand, Madame Curie could work diligently at her research because she was blessed with a good husband who was also a scientist and she had the good fortune to discover radium by accident while doing research on uranium.

This suggests that unexpected discoveries, ideas and flashes of inspiration may be the result of a combination

of accident and necessity.

However, it may also be that these lucky accidents occur precisely because the inventor persists in seeking a certain result and these unexpected results can lead to new discoveries because he or she has an attitude which is openly receptive to the facts represented by those results and is willing to face the facts head-on.

While I was in charge of product development and technology development, there were fortunately products which were developed based on what can be considered accident and some are still being used by customers today, after as much as 30 years.

There are also many opportunities in our familiar environment to meet with good fortune which is the result of accident. In particular, young engineers with a challenging spirit have many such chances. It is my hope that these young people will enjoy the good luck which results from accumulating experience through extensive experiments and practice.