

## PERSPECTIVE ȘI DEZVOLTARE ÎN METALURGIA PULBERILOR

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### *Abstract*

*Dezvoltarea metalurgiei pulberilor a fost determinată de produse științifice și tehnice cu nevoi speciale nu se pot echivala cu alte proceduri clasice. Datorită avantajelor pe care le are metalurgia pulberilor în lume există o tendință ascendentă în comparație cu alte tehnologii. Noi nu putem spune că țara noastră se bucură de aceleași interese generale de tehnologie.*

*Cuvinte cheie: produse, tehnologice, thnică, proceduri clasice, metalurgia pulberilor.*

### **Introducere**

Cunoașterea și aplicarea precoce a metalurgia pulberilor (PM) acum mai bine de 100 de ani, au condus la ridicarea câtorva întrebări care frământau mintea și atenția oamenilor de știință de la acea vreme:, întrebări cum ar fi. Metalurgia pulberilor poate fi o tehnică viabilă? Materialele metalice pot fi produse prin acest proces? Care sunt avantajele dmetalurgii pulberilor? Materialele rezultate pot înlocui materialele compacte? Care sunt costurile tehnice și economice?

La toate aceste întrebări s-a răspuns prin prezentarea rezultatelor cercetării în acest domeniu, precum și prin literatura de specialitate din domeniu..

Metalurgia pulberilor poate intra cu succes în rândurile tehnologii datorit[ marii varietăți de piese clasice obținute prin acest proces.

## TREND AND DEVELOPMENT OF POWDER METALLURGY

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### *Abstract*

*Development of powder metallurgy has been determined by scientific and technical products with special needs can not draw other classical procedures. Due to the advantages it had powder metallurgy world an upward trend compared to other technologies. We can not say that our country enjoys the same general technology interests.*

*Key words: echnical products, technology, classical procedures, powder metallurgy.*

### **Introduction**

Early knowledge and application of powder metallurgy (PM) ago more than 100 years, had belonged to the few questions that often, mind and attention of scientists at that time, questions such as. Powder metallurgy can be a viable technique? Metallic materials may be produced by this process? What are the advantages of powder metallurgy? The resulting materials can replace compact materials? With the technical and economic costs?

All these questions answered by submitting results of research in this area and the rich literature rounds out the field.

Powder metallurgy can successfully enter the technology among the wide variety of classical pieces obtained by this process.

### **2. Current status of powder metallurgy**

In recent years in most industrialized countries compete successfully powder metallurgy conventional technologies (forging, casting and cutting), powder metal technology in Europe is well known but pervasive that in North America and Japan.

Powder metallurgy is a technology that requires rapid and economical to obtain products with predetermined properties, metal matrix, alloys or combinations of metals in a variety of simple or complex geometric shapes.

Powder processing technologies, increase productivity and economic efficiency due to reduced consumption of raw materials, energy and physical labor. Technical and economic importance of application of powder metallurgy resulting in several important advantages: [1.2]

- high coefficient of utilization of material by eliminating waste technology;
- provide a precise and uniform composition;
- the possibility of obtaining parts and geometric shape sintered to final dimensions;
- the possibility of obtaining materials and products with special properties that can not be developed by conventional methods;
  - the possibility of replacing expensive materials;
  - change possibility of processes;

- technological cycle leads to the elimination of manual processing machines and lines of economic damage on reducing energy and labor.

Obtaining metal parts through the various technologies leading to their classification:

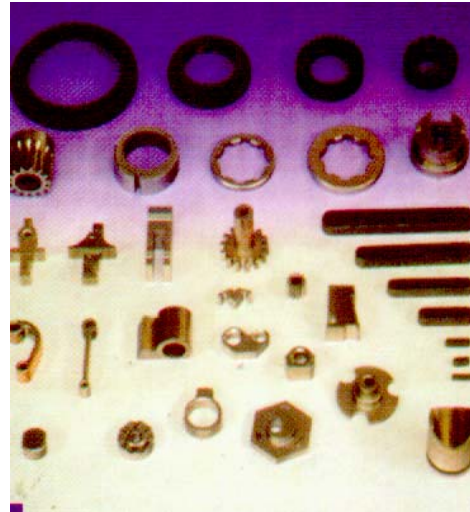
- pieces made by traditional technologies (casting, forming, cutting) but which uses large amounts of materials, energy and labor, as compared with powder metallurgy, which simplifies the process of production, raw materials and little miss eliminated most of the cutting;
- items that can not be executed through traditional technologies due to high refractory or complex structural combinations, porosity conditions or other situations where technology replaces conventional powder metallurgy;
- combination of metals and composite metals and diverse specific only to powder metallurgy.

Positive effects of powder metallurgy have led to rapid growth in the world so that progress can play pieces of iron powder, steel or copper in the world. Examples of powder metallurgy products in our country we can show in Figure 1. [1.4]

Fig.1 Powder metallurgy parts



Fig.2 Distribution of materials sintered in industrial areas



The largest consumer of powder metallurgy materials being in Japan can show their distribution in major industries such, it uses over 80% of the products obtained by MP in vehicle construction and the weights lower electrical machinery, industrial machinery other uses, Figure 2. [1,3]

In our country was placed on a low level of mechanical engineering, electrical, mechanical, etc. Fine. The first MP were researching the ICEM activity in early 1960, where he also began research on porous materials based on iron, iron-graphite, with or without addition of copper, lead and other alloying elements.

Research has shown the use of products in powder form or directly in the production of sintered products.

The first research came from the electrical and mechanical engineering industry.

Manufacturing electric brushes requires appropriate quality copper powders in mechanical engineering and the

need for self-lubricating parts. Therefore research is underway in these areas that led to the industrial phase transition at SINTEROM Cluj-Napoca and the University of Craiova.

Industry development and large-scale introduction of sintered hard alloys in machine construction industries has led to a thorough research in the research database. The annual increase in the quantity of material strength sintered parts produced by powder metallurgy recorded in the motor industry, table 3.

Table 3 Use of powder metal parts

SEGMENT	TONE	ANNUAL GROWTH	ESTIMATED GROWTH	ESTIMATED VOLUME
MARKET	1995	1991-1999	2002-2008	2008-2010
Metal powders	117.000	5%	8-10%	>150.000
Hard materials	6.700	5%	8-10%	8.500
Semiproducts of PM	20.000	10-20%	35- 40%	45.000

Research on powder metallurgy in the country are modest compared to industrialized countries, the exploration was considered a possibility for young researchers.

### 3. Conclusions

Powder metallurgy is a technology that requires rapid and economical to obtain products with predetermined properties, metal matrix, alloys or combinations of metals in a variety of simple or complex geometric shapes.

In industrialized nations is a technology that can successfully replace conventional technologies. Most applicability has in Japan and North

America.

Western Europe attaches great importance to the production and use powder since 1995. New scientific research indicates the growing concerns of large pieces of metal powders to achieve superior properties and high economic efficiency, to replace the products obtained by conventional technologies.

In our country began a modest development, meeting the necessary parts automobile industry and other small pieces of hardware. Economic progress is continuously influenced the development and application of technologies and materials elaborated by powder metallurgy.

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