

**Japan Society of Powder and Powder Metallurgy (JSPM)**  
**Instructions of “J. Jpn. Soc. Powder Powder Metallurgy”**

(Revised June 2016)

## **1 Introduction**

A submitted manuscript shall be prepared in English. In principle, the number of printed pages for a manuscript for “new technologies and new products” should be 3 or less pages and that for a “technical rapid communication” should be 4 or less pages. Otherwise, there is no limitation on the number of printed pages for a manuscript.

We have introduced an online manuscript submission and review system called Editorial Manager<sup>®</sup>. When making a submission, you are requested to first log-in to the Editorial Manager<sup>®</sup> website (<https://www.editorialmanager.com/jjspm/>) and register yourself as a user. Upon review of the author’s manual, please have files ready for the manuscript, the figure(s), the table(s) and the photo(s) (please refer to Manuscript Samples; the manuscript and the figure(s) should be stored in separate files) and a copyright transfer agreement (downloaded from the homepage). After inputting your user name and password, you may begin a new submission by clicking “Author Log-in.”

## **2 Manuscript for Submission**

The following instructions should be followed to prepare a manuscript for submission.

- ① Use A4-sized paper sheets (in portrait orientation) and leave a margin of 20 mm at the top, bottom, and sides of each page.
- ② Use a font size of 12 points and set the number of letters per line to 80 and the number of lines per page to 40.
- ③ Use the Times New Roman font, and the Symbol font for Greek letters.
- ④ Format using single spacing for all lines, except before headlines, in which case, please use double space.

### **2.1 Estimated Number of Printed Pages**

Once the decision is made to publish a manuscript, the JSPM Office produces a final copy of the manuscript formatted for publication and printing. In this case, if the manuscript submitted consists of approximately 8 pages, the manuscript will be printed into 5 pages.

### **2.2 Title (Required Field)**

Please refer to the Manuscript Samples and write the title, the author’s name, and the name and address of the organization to which the author belongs in the order below.

- ① Submission Categories

A submitted manuscript should belong to one of the following categories: paper, rapid communication, short note, technical report, memorial lecture of JSPM Award, general review, review, technical rapid communication, summarization, new technologies and new products, and Materials Transactions.

② Title

A title should be specific and describe the submitted contents. The title (including a subtitle) should be comprised of 120 or less letters. For the title, the first letter of each word should be in uppercase, with the exceptions of articles, prepositions, conjunctions, and relative pronouns.

③ Author's Name

Please write the author's name in full in the order of the given name and the family name, with the first letter of the given name and all letters of the family name appearing in uppercase. Please insert "and" before the name of the author listed last. Please add an asterisk mark in superscript "\*" to the corresponding author.

④ Name and Address of the Organization

Please refer to the Manuscript Samples and reduce their length as much as possible to the extent that they are still legible for mail delivery. (The names of prefectures, except for "districts," should be omitted.)

⑤ Corresponding author's e-mail address

Please use double spacing after the name and address of organization and write corresponding author's e-mail address as follows.

\*Corresponding author, E-mail: <write your e-mail address>

### **2.3 Abstract and Key Words (Required Field)**

An abstract should be comprised of 200 or less words. Please select 5 or less key words and list them after the abstract. As shown in the Manuscript Samples, they should have the headlines "ABSTRACT" and "KEY WORDS," respectively, with all letters appearing in bold uppercase. As for the key words, letters other than proper nouns should be in lowercase.

### **2.4 Body of Manuscript**

When preparing a manuscript, please be concise and to the point, and avoid duplicate descriptions as much as possible.

Please use double spacing before each headline. For all other lines, please use a single space format.

#### **2.4.1 Headlines**

Please use double spacing before each headline. For a headline number, a number should be formatted in bold type and followed by one space without a period.

#### **2.4.2 Subhead**

Please use single spacing before each subhead. A subhead number should be assigned in sequence from a leading line, such as “1.1,” “1.2,” etc. One space should be inserted between the number and the subhead. After the space, letters should be used in non-bold type.

#### **2.4.3 Footnote**

A footnote should be marked with symbols \*1), \*2), etc. and typed out at the bottom of a page, with a horizontal line drawn above the footnote.

#### **2.4.4 Figures and Captions**

- (a) Figures should not be inserted into the body of a manuscript, but submitted in a file separate from the manuscript body file. Please be sure to name the files and sequentially number figures and photos as Fig. 1, Fig. 2, etc. and tables as Table 1, Table 2, etc., when uploading the figure(s) etc.
- (b) Captions should be inserted altogether after “References,” with double spacing used before the captions. After each figure caption, please indicate in parentheses whether the figure should be presented within one column of the double-column format or extended over both the columns of the double-column format to recognize the sizes of the figures and tables. (See the Manuscript Samples.)
- (c) In the event that one figure includes 2 or more figures or photos, please indicate (a), (b), (c) in their upper left sides, respectively. (See the Manuscript Samples.)
- (d) In figures and captions, only the initial letter of a first word should appear in uppercase, and other letters should be formatted in lowercase. As for the font type, Times New Roman should be used.
- (e) Letters in figures should be typed in a font size of 9 points or larger in consideration of balance of the letter when was printed.
- (f) In the case of a figure that is originally in color, please paste it as it is in color without changing it to gray scale. In principle, a figure, even if it is originally in color, will be printed in black and white.
- (g) If you wish to have a figure(s) printed in color, please ensure that this is stated clearly. The contributor shall pay the actual cost incurred for color printing.
- (h) Figure formatting will be completed by the JSPM Office.

#### **2.4.6 References**

- (a) When citing references, please sequentially number the references and indicate the reference numbers in a right parenthesis in superscript form as follows: <sup>1-4</sup>,

etc. for sequential reference numbers, and <sup>1,5)</sup>, etc. for non-sequential reference numbers.

- (b) All references should be inserted at the end of the body of a manuscript.
- (c) In case of multiple authors, although it is desirable to list the names of all authors, when the number of authors exceeds two, it is permissible to use “et al.” The names of those other than the author listed first can thus be omitted. The names of foreign journals can be expressed using abbreviations that comply with the international practices, SIST 05, ISO, etc.
- (d) The title of the Journal of JSPM should be written as “J. Jpn. Soc. Powder Powder Metallurgy,” and the abstracts of annual meetings should be written as “Abstracts of Spring/Autumn Meeting JSPM, publication year (Christian era year)”
- (e) References should be specified as in the following examples:

Journals – Author’s name(s): Title of journal, **Volume number** (Publication year), Starting page number - Ending page number.

Books – Author’s Name(s): Title of book, Edition statement, Publisher (Publication year), Pages.

Proceedings – Author’s name(s): Title of proceedings, Name of editor, Meeting venue, Meeting year, Name of organizer, Publisher (Publication year), Starting page number - Ending page number.

«Examples»

- 1) H. Nakayama, K. Yamagami, H. Kyogoku, S. Komatsu: J. Jpn. Soc. Powder Powder Metallurgy, **44** (1997) 427-431.
- 2) T. Watanabe: Shinban Funmatsuyakin, Gijutsushoin, (1976) 25.
- 3) P. Nielsen, Y. L. Liu, N. Hansen: Proceedings of 1993 Powder Metallurgy World Congress, Y. Bando and K. Kosuge ed., Kyoto, Japan Society of Powder and Powder Metallurgy, (1993) 58-61.

#### **2.4.7 Units and Symbols**

- (a) Please use the SI units.
- (b) In principle, one space should be inserted between a numerical value and a unit.
- (c) Symbols used in thermodynamics, physical chemistry, nuclear physics, etc. and their rules of usage should comply as much as possible with the standards of the International Organization for Standardization (ISO) and the International Union of Pure and Applied Chemistry (IUPAC).

#### **2.4.8 Numerals and Numerical Expressions**

- (a) In principle, a numerical range should be typed out in the following manner:  $(1.0\sim 1.5)\cdot 10^5$ , 10~15s, etc.
- (b) As for numerical expressions in sentences, care should be taken to ensure that the numerical expression is typed out in one line, provided this does not cause a misunderstanding.
- (c) Please do not insert a comma and a period in a numerical expression unless necessary.
- (d) An exponential function should be enclosed within `exp( )`.

«Submission Procedure»

For the submission procedure details, i.e. specific procedural steps for submission, the Manuscript Samples, etc., please refer to the JSPM homepage.

[http://www.jspm.or.jp/jjspm\\_e.html](http://www.jspm.or.jp/jjspm_e.html)

«Manuscript Sample 1» Page 1 of Manuscript

Paper ←Category

If different authors belong to different organizations, please assign numbers to the organizations.

Investigation of Fine Heterogeneous Microstructure on the Mechanical Properties of MIM Fe-Ni Alloy Steels

Write an author's name in full, with the family name spelled all in uppercase.

Wan Sharuzi WAN HARUN<sup>1</sup>, Toshiko OSADA<sup>2</sup>, Hyungoo KANG<sup>2</sup>, Fujio TSUMORI<sup>2</sup>, and Hideshi MIMURA<sup>2\*</sup>

Add an asterisk mark in superscript "\*" to the corresponding author.

<sup>1</sup>Graduate School of Kyushu University, 744 Motooka Nishi-ku, Fukuoka 819-0395, Japan.

<sup>2</sup>Dept. Mechanical Eng., Kyushu University, 744 Motooka Nishi-ku, Fukuoka 819-0395, Japan.

(Use double spacing.)

Insert "and" before the name of an author listed last.

\* Corresponding author, E-mail: aaa@ooo.kyushu-u.ac.jp

(Use double spacing.)

**ABSTRACT** 200 words or less

The influence of nickel particle sizes, nickel mass%, and sintering temperatures on the microstructure and mechanical properties of injection molded Fe-Ni compacts have been studied. The mixed elemental carbonyl iron and water-atomized nickel powders were utilized in this study. Tempered compact added 6 mass% fine nickel powder which was sintered at 1250 °C for 1 hour showed superhigh strength of 2040 MPa with elongation of 8.1 %, the best properties among reported data in MIM low alloy steel compacts. These excellent mechanical properties by fine heterogeneous microstructure of the compact are explained in terms of the complicated networks of nickel content variation throughout the steel matrix.

**KEY WORDS** ←5 or less key words. Letters other than proper nouns should be in lowercase.

Fe-Ni alloy steels, fine heterogeneity, microstructure, nickel rich phase, nickel diffusibility.

(Use double spacing before a headline.)

Put no period after a headline number.

**1 Introduction** ←Put a headline and its number in bold type.

The excellent mechanical properties offered by MIM Fe-Ni alloy steels have been widely known. Since then, numerous efforts have been put into placed by various researchers in order to

----- an omission -----

Write a reference number in superscript form.

elongation <sup>2)</sup>. The Ni concentration profile obtained by electron probe microanalyzer (EPMA) found out that peaks and valleys of Ni content were dispersed throughout the mezzo heterogeneous microstructure matrix <sup>1-3)</sup>.

In the case of sequential reference numbers, indicate them by using hyphenation.  
In the case of non-sequential reference numbers, indicate them by using a comma.

----- an omission -----

Use single spacing before a subhead.

**4 Discussion**

For a subhead number including ".", use in non-bold type.

4.1 The Nickel Diffusibility

Topography of Ni element by EPMA analysis has confirmed that compacts with fine Ni powder demonstrates excellent Ni diffusion into the surrounding matrix as shown in Fig. 3 (a). There were some Ni free regions in Fe-6Ni-c alloy matrix where Ni did not diffuse at all. Fe-6Ni-f alloy compact where Ni effectively diffused throughout the matrix, offered superior mechanical properties over Fe-6Ni-m and Fe-6Ni-c compacts. For this point, attention should also be given to

## «Manuscript Sample 2» Last Page of Manuscript

### 5 Summary

The effect of Ni distributions to the matrix has been studied for obtaining the excellent mechanical properties of injection molded Fe-Ni alloy steels using mixed elemental powders. Tempered Fe-6mass%Ni compact with fine mixed elemental powders achieved superhigh ultimate strength of 2040 MPa, yield strength of 1200 MPa, hardness of 56 HRC, and elongation of 8.1 %. EPMA analysis for Ni distribution confirmed fine and heterogeneous microstructure showed better performance in their mechanical properties. Therefore, careful control of the dispersion state of the Ni concentration throughout the matrix is a key factor for their excellent properties.

(Use double spacing.)

Please use a right parenthesis to indicate a reference number.

### References

Use a colon after an author's name.

1) H. Miura, M. Matsuda : Material Transactions, **43** (2002) 343-347.

Write a volume number in bold

2) M. Matsuda, H. Miura : Metals and Materials International, **9** (2003) 537-542.

5) H. Miura, S. Mitomi, S. Ando, T. Honda : J. Jpn. Soc. Powder Metallurgy, **42** (1995) 378-382.

When referring to the Journal of JSPM, write the title as indicated here.

8) Materials Standards for Metal Injection Molded Parts, 2007 Edition, MPIF, Princeton, NJ, (2007) 16-17.

Indicate a starting page number and an ending page number.

Period

9) Metals Handbook, 10th ed., vol. 1, ASM Int., Materials Park, OH, (1990) 430-448 and 793-800.

(Use double spacing.) ↓ Please list captions of figures and tables here in the order of appearance in the body of manuscript.

Fig. 1 Schematic illustration of the experimental apparatus. (One column)

Fig. 2 Relationship between relative density and energy density. (Layer thickness; 100 μm)  
(One column)

Table 1 Mixing ratio of wax based binder. (Both columns)

Fig. 3 SEM images of mixed powder and binder: a) under 90 μm and b) under 180 μm in diameter. (One column)

Table 2 Laser forming conditions in this study. (One column)

Table 3 Results of preliminary experiment by laser forming. (One column)

Fig. 4 Sectional micrographs of specimens formed with different mixing ratio of powder and binder. (Scan rate; 250 mm/s Scan pitch; 100 μm Layer thickness; 400 μm) (Both columns)

Please indicate, at the end, whether the figures etc. should be shown within one column of a double-column format (referred to as "one column") or shown to extend over both columns of the double-column format (referred to as "both columns").

## «Manuscript Sample 3» Figures, Photos, and Tables

### «Notes»

- Only the initial letter of a first word should be in uppercase, and other letters should be written in lowercase. (A font type is Times New Roman.)
- Letters in figures should be written in a font size of 9 points or larger in consideration of balance.
- In the case where one figure includes two or more figures or photos, please put (a), (b), (c) ... in them, respectively.
- In the case of a figure that is originally in color, please paste it as it is in color without changing it to gray scale. In principle, the figure will be printed in black and white.

Fig.1

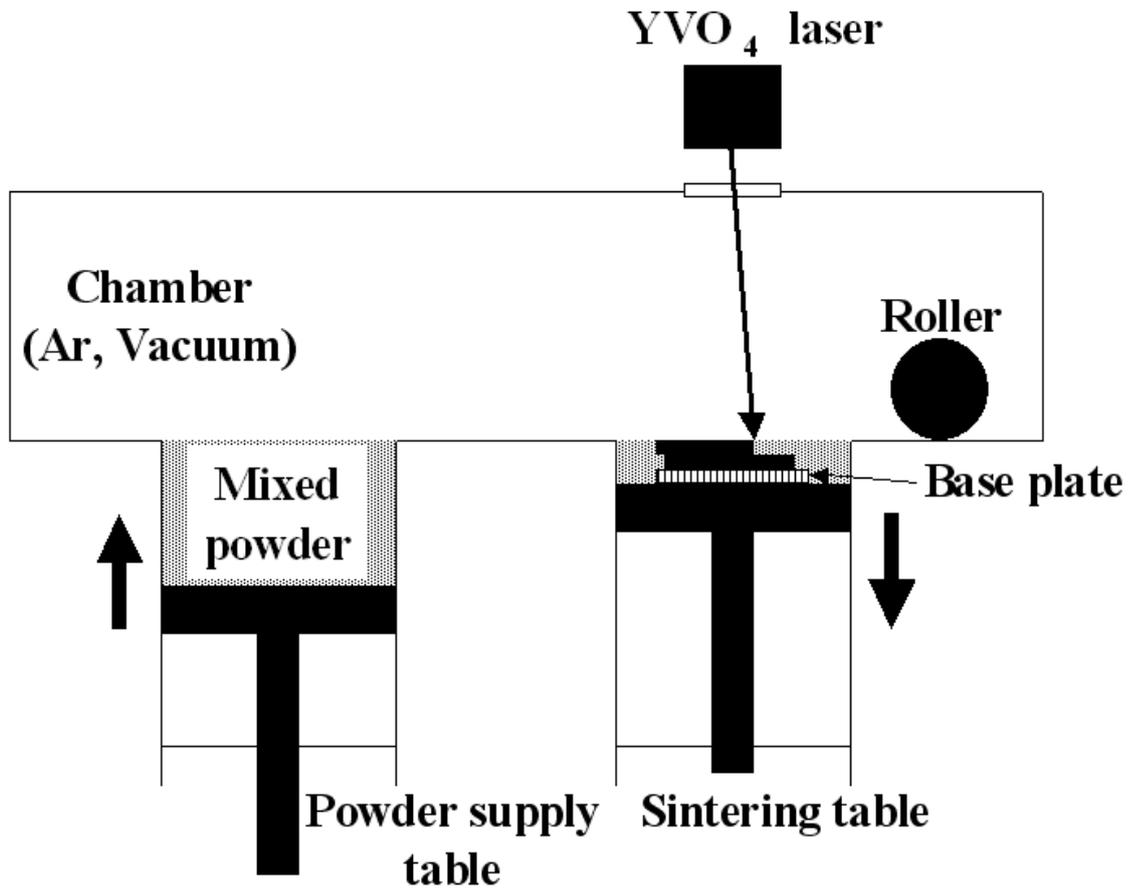


Fig.2

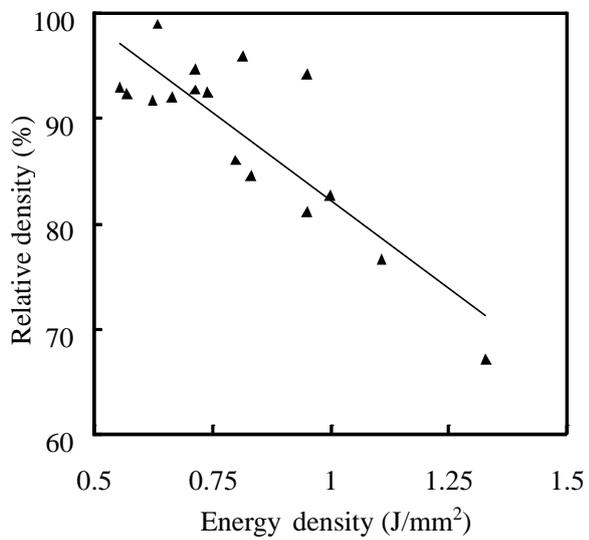


Table 1

	APP	CW	PW	SA
Specific gravity [Mg/m <sup>3</sup> ]	0.860	0.995	0.895	0.941
Mixing ratio [mass%]	25	10	64	1

Fig.3

