

BMM3643 Manufacturing Processes

Powder Metallurgy Process

Quiz 2

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Quiz 2- Powder Metallurgy Process

- Aims
 - Differentiate the various operations needed in powder-metallurgy process
 - Analyze the characteristics of production, blending and compaction of metal powders operations
- Expected Outcomes
 - Able to analyze the characteristics of production, blending and compaction of metal powders operations



Quiz 2

1-Which one of this is the correct sequence of powder metallurgy process?

- (A) Compaction-Blending-Sintering- Finishing Operation
- (B) Producing Metal powders-Blending-Compaction-Sintering-Secondary Operation
- (C) Producing Metal powders-Sintering-Blending-Compaction-Secondary Operation
- (D) None of the above

2-Which of these are NOT method to produce metal powders?

- (A) Atomization
- (B) Carbonyls
- (C) Mechanical alloying
- (D) Isostatic Pressing

3-Below are listed as cold compaction EXCEPT

- (A) Rolling
- (B) Extrusion
- (C) Comminution
- (D) Isostatic Pressing

4-Which of this choice is NOT methods of metal powder production by atomization

- (A) Carbonyls
- (B) Gas
- (C) Water
- (D) Centrifugal with spinning disk

5-In compaction of metal powders, size distribution of the metal powder SHOULD BE

- (A) In the same size and shape
- (B) In different size and shape
- (C) Used lubricant to increase the compaction
- (D) None of the above

6-There are two types of mechanism for sintering metal powders

- (A) Solid state and vapour state material transport
- (B) Liquid state and semi-solid state material transport
- (C) Vapour state and liquid state material transport
- (D) None of the above



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7-What is the purpose of sintering in powder metallurgy process?

- (A) To improve the strength of the material
- (B) To increase the compaction
- (C) To decrease the ductility of the material
- (D) To melt the metal powders

8-Which of these are secondary & finishing operations?

- (A) Coining and sizing
- (B) Hot isostatic pressing
- (C) Mechanical alloying
- (D) Sedimentation

9-Below are methods to screen metal particle size and shape EXCEPT

- (A) Suspending particles in a liquid
- (B) Sedimentation
- (C) Microscopic analysis
- (D) Coining and sizing

10-Choose the correct match of powder morphology with the methods to produce powder metal.

- (A) Reduction: flaky and rounded
- (B) Carbonyls: irregular
- (C) Atomization: spherical
- (D) Mechanical alloying: dendritic

11-Which of these is the limitations of HIP

- (A) The process is relatively expensive
- (B) Not good metallurgical bonding of powders
- (C) Required lubricant to increase the compaction
- (D) None of the above

12-How to reduce the density variation in the compacting of powders?

- (A) By adding lubricants
- (B) By reduce the pressure
- (C) By increase the sintering temperature
- (D) By adding similar size of metal particles



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13-These are the similarities of forging and compacting metal powders EXCEPT

- (A) Neither of both processes requires finishing operations
- (B) Both involve metal workpieces and will produce workpieces with similar mechanical and physical properties
- (C) Both requires sintering process
- (D) None of the above

14-Which of these are NOT design considerations for powder metallurgy parts?

- (A) Should be made with thick walls to ease ejection
- (B) Should be made with the widest acceptable tolerances
- (C) Simple and uniform shape as possible
- (D) Eliminate the use of true radius

15-Which of this is best describe cold compaction

- (A) Metal powder is placed in a flexible rubber mold and pressurized hydrostatically
- (B) Container is made of high-melting-point sheet metal
- (C) Mainly used for super alloy casting, aircraft, military & medical
- (D) None of the above

Quiz 2 Format

Please remember to **include the questions** given in the assignments. Your answer **MUST** be in **hand writing**. Not need for cover page, but you need to write your details such as:

1. Your Name & No. Matric
2. Section
3. Lecturer's Name
4. Submission date

Submit at the end of lecture. Late submission will not be entertained.

