

PhD notebook

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1 Administration

- Create tax card, need contract information as salary
 - ⇒ link is here and go to Forskudsopgørelse
- Webinar "moving to Denmark and PhD at DTU"
 - ⇒ take the session 2026/02/20 from 1pm to 2 pm
- Mandatory introduction culture day
 - ⇒ Chose the option 10 March from 10:45 am to 2 pm
- Introduction to responsible conduct of research and research data management for new employees
 - ⇒ chose 6 April from 9am to 1 pm

2 Teaching

2.1 Course preparation

3 Bibliography

3.1 Powder production processes

3.1.1 Gas atomization

3.1.2 Water atomization

3.1.3 Centrifugal atomization

3.1.4 Plasma atomization

3.1.5 Mechanical attrition and alloying

3.1.6 Melt spinning

3.1.7 Rotating electrode process (REP)

3.1.8 Chemical processes

3.2 Factors influencing metallic powder size and quality during gas atomization

3.2.1 Feedstock melting

One of the melting process is to use a crucible heated by induction. It allows different type of feedstock as powder, scrap, wire, and can accept pure metal elements or pre-alloyed elements. All these parameters will impact the powder quality. For instance, the melted scraps can be heterogeneous and can come with oxidation and impurities. In these cases, it is recommended to take a sample of the homogenous melted material in order to analyze the chemistry [1].

Both opened and closed melting systems are used in gas atomization.

3.2.2 Gas environment

3.2.3 Nozzle geometry

3.2.4 Thermal condition

3.3 Powder characterization

3.3.1 Ductility and hardness

3.3.2 Impurities and reactivity

3.3.3 Tap density, apparent density, compressibility, green strength, flow properties and compressibility

4 Experiment: title

4.1 Description

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4.5 Next steps

TO-DO LIST

→ Create tax card, need contract information as salary	2
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References

- [1] Kazybek Kassym and Asma Perveen. Atomization processes of metal powders for 3D printing. *Materials Today: Proceedings*, 26:1727–1733, 2020.