

Activity at the IMID

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ÚSTAV
KONSTRUOVÁNÍ

Content

- Dissertation theme
- Engagement on projects
- Economic cooperation
- Publishing
- Teaching



Motivation

Processing of magnesium alloys by SLM

SLM processable alloys

- AlSi10Mg, AlSi12, AlSi7Mg, Al Mg4.5Mn0.4, Reintitan, Ti6Al7Nb, Ti6Al4V Ti64ELI, 1.2709 (ST2709B), 1.4404 (316L), 1.2344 (H13), 1.4542 (17-4PH), Co212-f, Inconel 625, Inconel 718, Incone HX (2.4665)

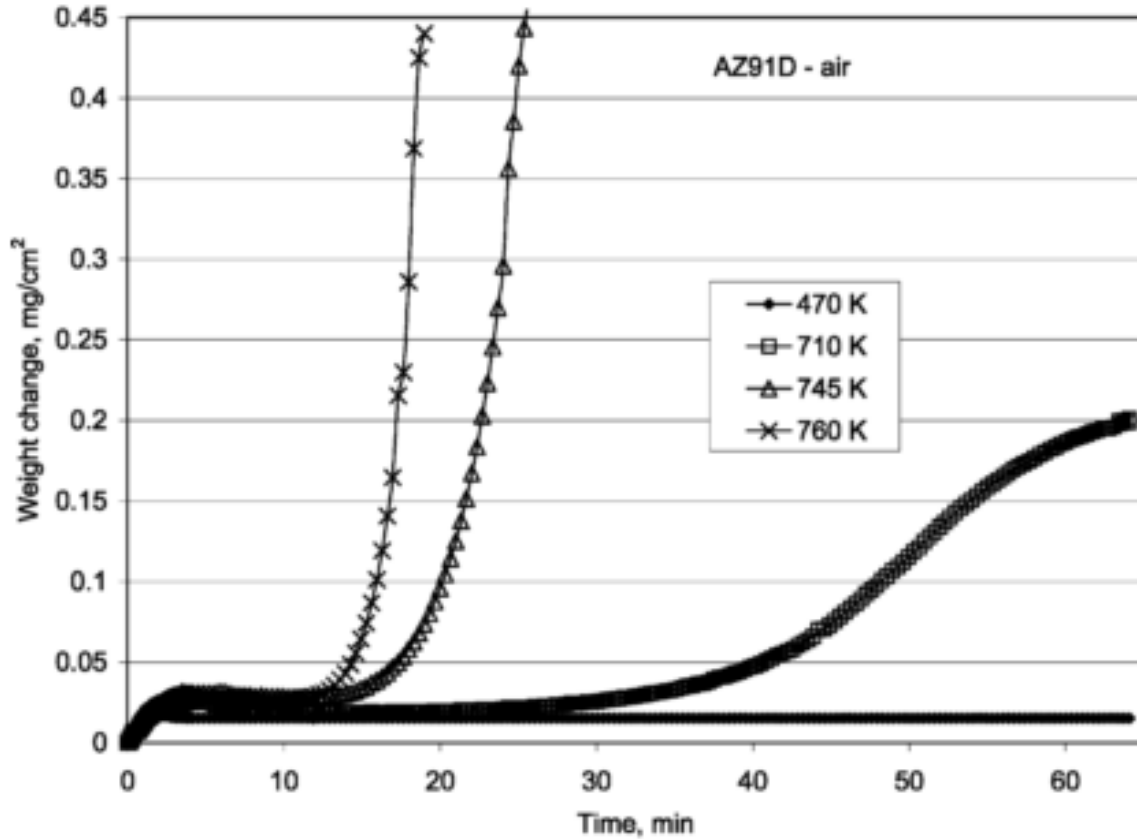
Magnesium alloys

- lightweight, strength, vibration resistant
- biodegradable



Structure part
(Renishaw)

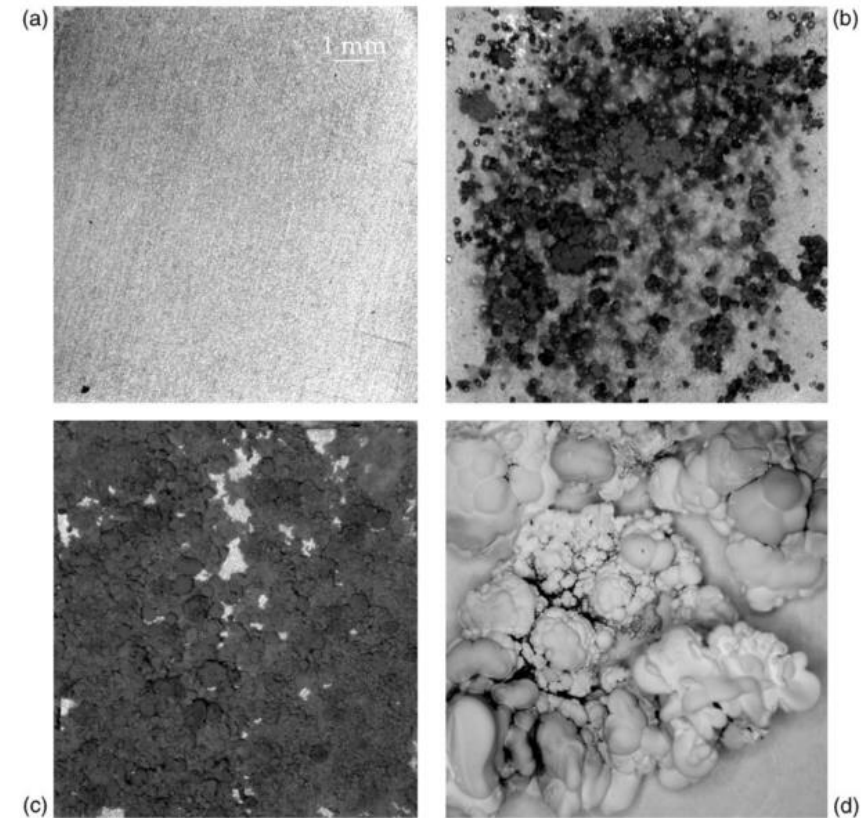
Research challenges



Oxidation magnesium alloy AZ91 at the elevated temperature
(Czerwinski, 2002)

380 °C/ 10h

470 °C/ 1h



500 °C/ 1h 550 °C/ 10 min

Demonstration of oxidation rate of AZ91
(Czerwinski, 2002)

Research challenges

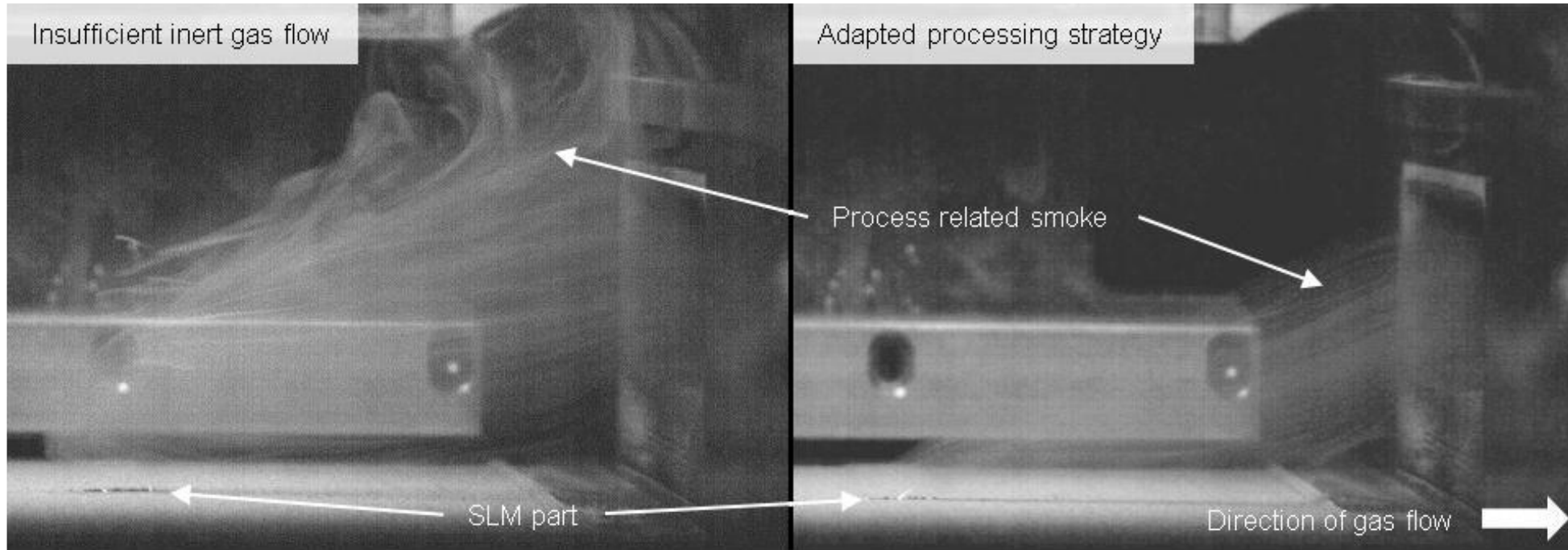
Dissertation theme

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The record of the smoke creation during production process of AZ91D
(Jauer, 2016)

Biodegradable structured implants produced using the 3D metal printing method



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PRAGUE**

TACR TH02010514

Dissertation theme

Engagement on project

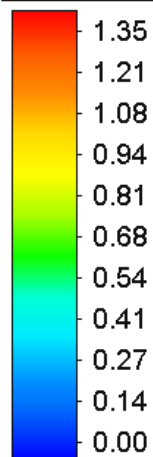
Economic cooperation

Publishing

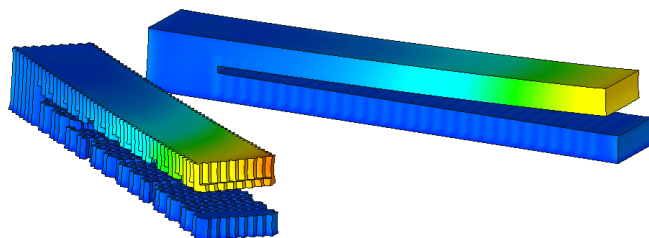
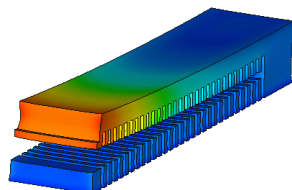
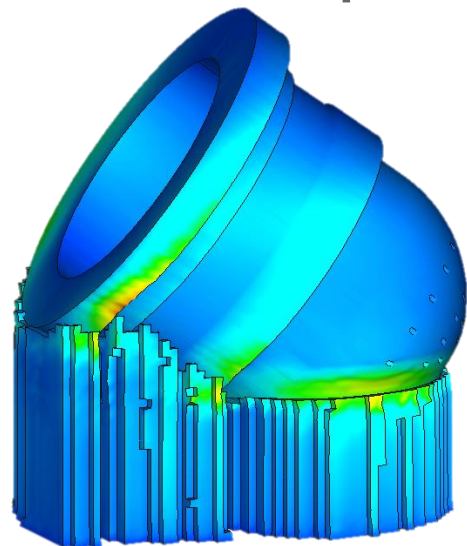
Teaching

Development of 3D print technology for chosen materials and topology optimization of components for aeronautics

Total displacement [mm]



max: 1.36
min: 0.00



- 0° Specimen – Δz_{\max} 2,34 [%]
- 45° Specimen – Δz_{\max} 1,05 [%]
- 90° Specimen – Δz_{\max} 5,39 [%]

Activity at the IMID

Honeywell

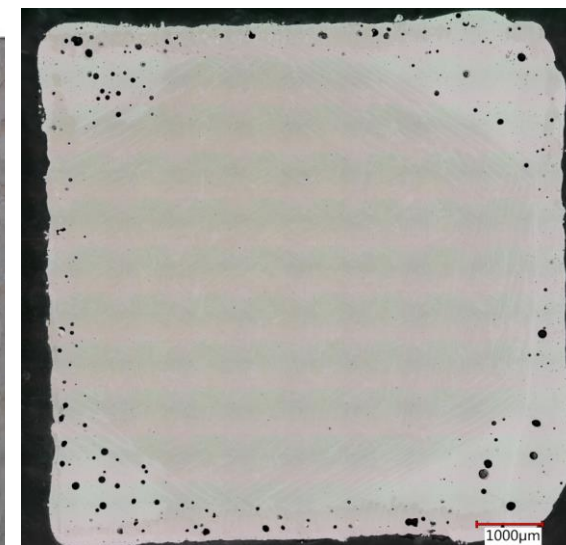
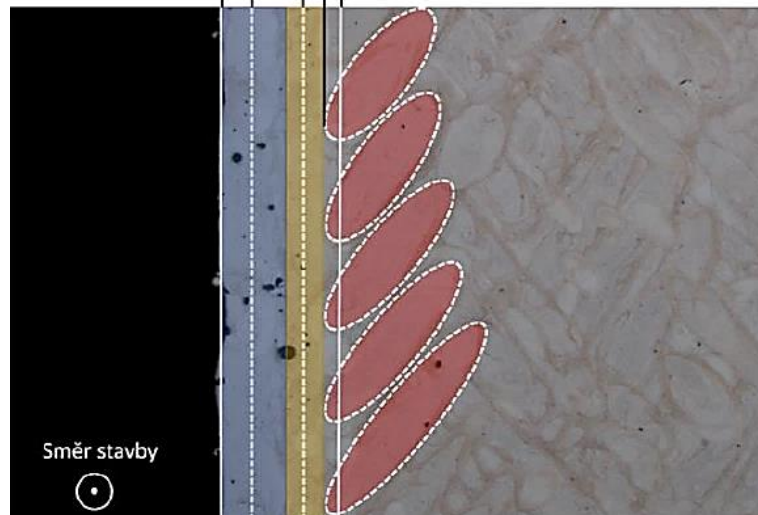
THE POWER OF **CONNECTED**

Fill contour offset

Fill pattern offset

Border distance

Beam compensation

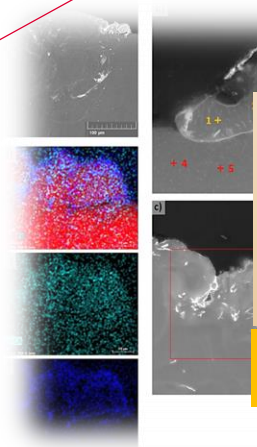
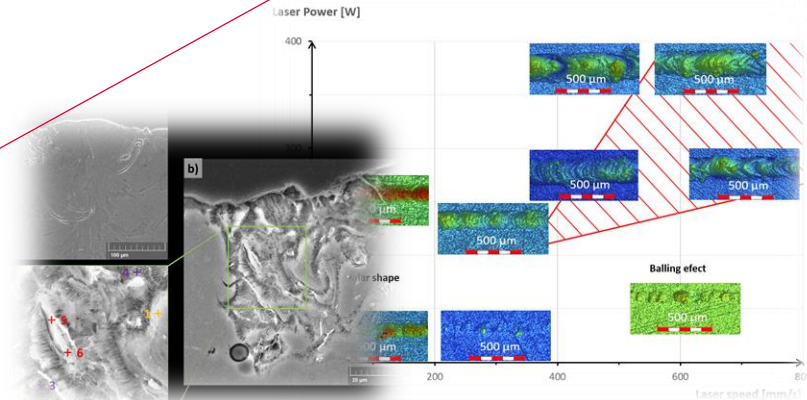
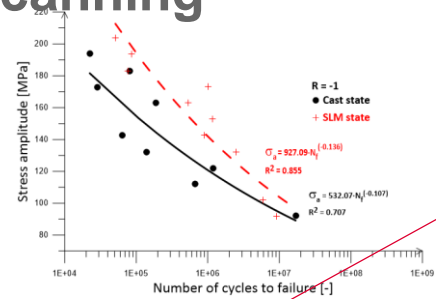
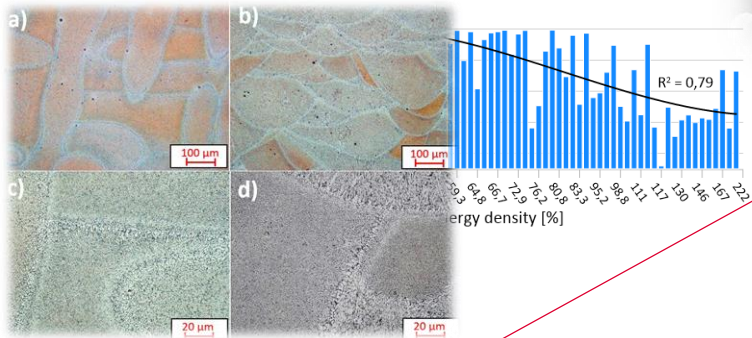


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Publishing activities

Processing of AlSi9Cu3 alloy at the high scanning speed by SLM

metals Q2
an Open Access Journal
Under revision



materials Q2
an Open Access Journal
Under construction

Processing of biodegradable magnesium alloy WE43 using selective laser melting

Teaching



Lectured subjects

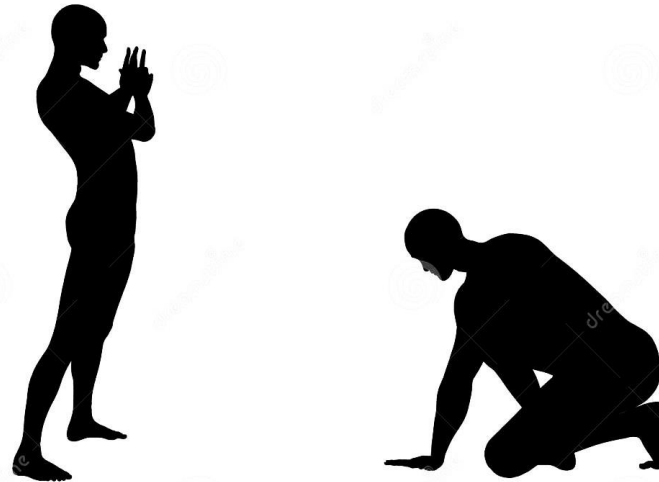
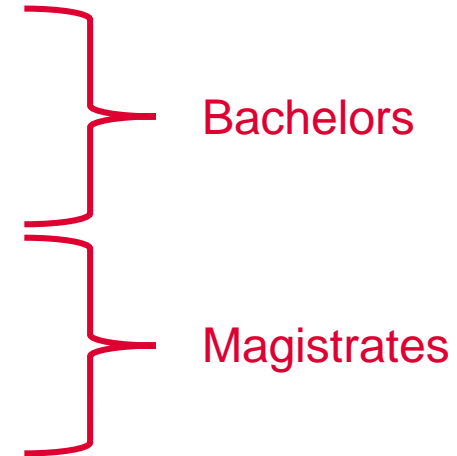
Winter semester

- CAD (3CD)
- Design a CAD (CKC)
- Fundamental of design (1K)

- Parametric modelling (ZM1)
- Additive technology (ZAT)

Summer semester

- Design and CAD (4KC)
- Design (2K)



Thank you for your attention

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