Ductilisation of tungsten (W) through cold rolling

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Tue. 30 May 2017, PLANSEE Seminar, RM 9, 15:20
Introduction

- Innovative structural material for high-temperature energy conversion systems
Introduction

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J. Reiser, Ductilisation of tungsten (W) through cold-rolling
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- J. Reiser, Ductilisation of tungsten (W) through cold-rolling
Materials and microstructure

- 5 plates, rolled-out from one sintered ingot, > 99.97 wt % W

<table>
<thead>
<tr>
<th>Thickness [mm]</th>
<th>Sintered ingot</th>
<th>1</th>
<th>0.5</th>
<th>0.3</th>
<th>0.2</th>
<th>0.1</th>
</tr>
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<tbody>
<tr>
<td>$\varphi$</td>
<td>/</td>
<td>1.7</td>
<td>2.4</td>
<td>2.91</td>
<td>3.31</td>
<td>4</td>
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<td>$T_{rolling}$</td>
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$< 1250^\circ C (1523 K)$

W, thickness of 1 mm

W, thickness of 0.3 mm

W, thickness of 0.1 mm
Ductility (I): Strain rate jump tests

Results

Theory

\[ T [^\circ C] \]

\[ T_k \]
Ductility (I): Strain rate jump tests

Results

Theory

strain rate sensitivity $m$

$T$ [$^\circ$C] $T_k$

J. Reiser, Ductilisation of tungsten (W) through cold-rolling
Summary and outlook

- Pipes made of cold-rolled, ultrafine-grained W sheets
Thank you for your attention

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Meet us at the poster session: Tue. 18:00 – 22:00, RM62 and RM63