

# **International Conference on High-Power Electron Beam Technology 2010**

**(EBEAM 2010)**

**Reno, Nevada, USA  
24 – 26 October 2010**

**ISBN: 978-1-61782-399-2**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2010) by Von Ardenne  
All rights reserved.

Printed by Curran Associates, Inc. (2011)

For permission requests, please contact Von Ardenne  
at the address below.

Von Ardenne  
Plattseite 19/29  
01324 Dresden Germany

Phone: +49 351 263 7300  
Fax: +49 351 263 7308

[office@vonardenne.biz](mailto:office@vonardenne.biz)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## PLENARY SESSION

|  |   |
|--|---|
| <b>Niobium Needs for Accelerators Past, Present and Future</b> ..... | 1 |
| <i>H. Padamsee</i>   |   |

## HIGH HEAT FURNACE STUDIES

|   |     |
|---|-----|
| <b>High Heat Flux Electron Beam Experiments for the ITER First Wall Program</b> .....   | 68  |
| <i>T. Lutz, D. Youchison, J. McDonald, R. Nygren, M. Ulrickson</i>  |     |
| <b>High-Power Electronbeam Guns used as Source of Surface Thermal Load</b> .....  | 122 |
| <i>A. Volodin, V. Kuznetsov, A. Komarov, N. Yablokov, N. Stepanov, V. Davidov, A. Kokoylin, A. Rogov, R. Rylev, R. Giniyatulin, N. Litunovsky, E. Alexeenko, M. Neumann, R. Nobis</i> |     |
| <b>High Heat Flux Testing Of Components For Future Fusion Devices By Means Of The Facility JUDITH 2</b> .....   | 149 |
| <i>A. Schmidt, A. Burger, K. Dominiczak, S. Keusemann, T. Loewenhoff, J. Linke, M. Roedig, C. Thomser</i>   |     |

## EB MELTING

|  |     |
|--|-----|
| <b>Refining of Silicon by Electron Beam Melting</b> .....  | 192 |
| <i>C. Lehnert, J. Flinspach, H. Franz, U. Biebricher, B. Scheffel, G. Mattausch, P. Feinaugle, R. Labitzke</i> |     |
| <b>Thermal-Fluid-Compositional Model of Electron Beam Casting of Ti-6Al-4V</b> .....                           | 215 |
| <i>R. Shuster, D. Maijer, S. Cockcroft, T. Meng, D. Favez</i>  |     |
| <b>Improved p°(Al) Data and {Al+Al<sub>2</sub>O<sub>3</sub>} Evaporation Behavior</b> .....                    | 239 |
| <i>E. Copland</i>  |     |
| <b>New EB Melting Capabilities at ULBA</b> .....   | 261 |
| <i>S. Dobrussin, D. Popov, M. Neumann</i>  |     |
| <b>New Electron Beam Technologies and Equipment for Zirconium Tube Billets Manufacture</b> .....               | 291 |
| <i>S. Ladokhin, V. Chernyvsyy, A. Gladkov, T. Lapshuk</i>  |     |
| <b>ALD - Electron Beam Melting Melting Service</b> .....   | 335 |
| <i>J. Flinspach</i>  |     |

## RELATED TOPICS

|   |     |
|---|-----|
| <b>The Electron Beam as a Tool of Both Nano Science and Micro Technology: From UHV Evaporation to Micro Electron Beam Surface Modifications</b> ..... | 358 |
| <i>M. Merkel, K. Wrobel, T. Unger, M. Zobac, I. Vlcek, L. Dupak, F. Roegner, G. Mattausch, A. Reichmann</i>   |     |
| <b>Flow Optimization For Drilled Water Passage Copper Products</b> .....  | 396 |
| <i>M. Dagle</i>   |     |
| <b>Electron Beam Welding Solutions</b> .....  | 403 |
| <i>G. Schubert</i>  |     |
| <b>HF for EB</b> .....  | 426 |
| <i>R. Guenther Jr.</i>  |     |
| <b>Ultra-Fast Ct X-Ray Imaging For Dynamic Process Visualization In Research And Industry</b> .....   | 483 |
| <i>F. Barthel, U. Hampel, G. Mattausch, F. Roegner</i>  |     |
| <b>Plasma-Based Electron Beam Sources For High-Rate PVD - And Beyond...</b> .....   | 509 |
| <i>G. Mattausch, P. Feinaugle, F. Rogner</i>  |     |
| <b>20 Years of Production of High Purity Niobium Ingots at CBMM</b> .....   | 541 |
| <i>L. De Moura, C. Sousa</i>  |     |
| <b>Author Index</b>   |     |