



## **Buehler Best Paper Award Presentation 2009 at the Metallography Congress in Aachen**



Awards Ceremony in Aachen, (l. to r.): Prof. Dr. Petzow, Dr. Ulrich Etzold, Dr. Frank Friedel, Ellen Berghof-Hasselbächer, Dr. Biljana Matijasevic-Lux, Dr. Andreas Neidel, Christian Bochert (Buehler GmbH).

The best articles of the previous year from the scientific journal “Practical Metallography” were awarded with the Buehler Best Paper Award.

For the ranking of the articles, 22 jurors from the scientific council of the journal Practical Metallography came together to judge the entries and award points; 5 points for first place, 3 points for second place and 1 point for third place. From a total of 38 published entries from the journal Practical Metallography in 2008, around half of them, namely 18 were considered worthy of merit, according to the jurors. The three entries with the highest point score are the winners for 2008. Again in 2008, the high quality of the selected articles made the decision particularly interesting. The span of the winning entries was relatively close again this year with the winning entries gaining 33, 38 and 41 points.

Prof. Dr. Petzow was responsible for the coordination and point scoring and I would like to take this opportunity to sincerely thank him for his efforts.

**3. Place (33 points, noted 13 times, 3 of which were first place):**

**Portable metallography applications based on replica technology demonstrated for non-destructive tests of large gas turbine parts**

**Dr. Andreas Neidel, Dr. Biljana Matijasevic-Lux, Dr. Stefan Leggemann, Susanne Riesenbeck, Thomas Ullrich, Jörg Völker, Sebastian Wallich, Siemens Power Generation, Gas Turbine Works, Berlin, Germany.**

The authors of this year's third placed entry were on stage last year, at the time being the second place award winners. In this year's article, the authors describe the portable preparation techniques and the application of replica technology in microstructure control on components. The article is a good summary of the topic and is therefore interesting for a broader audience. At the same time, the authors reveal a few tips and tricks from their own experience. Operators who are engaged in portable metallography will be glad to follow these. The question as to whether the attainable resolution of extraction replicas approaches the quality of metallographic specimens is answered by the authors with a clear "yes" – the smallest precipitates can be made visible with the SEM that are not at all visible with the optical microscope.

**2. Place (38 points, noted 10 times, 5 of which were first place):**

**Metallurgical characterisation of Zn-Fe-alloy coatings on galvanized thin sheet.**

**Dr. Ulrich Etzold, Ulrike Reitz, Reinhard Petzold, Dr. Frank Friedel, Friedhelm Macherey, ThyssenKrupp Steel AG, Duisburg, Germany.**

The fact that today's older vehicles are no longer rust buckets travelling on our streets is due not only to the car scrap bonus in Germany, but first and foremost to the fact that the sheets used for the bodywork are finished with a zinc-iron coating a few micrometres thick. Such thin sheets do not only possess excellent corrosion protection, they are also very weldable and paintable and as such, ideally suited for automobile construction. A prerequisite for this demanding application however, is a defined phase constitution of the Zn-Fe-alloy coating, which is controlled through metallographic investigations. A particular challenge here is the crevice-free embedding and the sharp edged preparation of the thin sheets. The article describes the combination of optical microscopy, scanning electron microscopy and x-ray diffraction for the characterisation of the coating and its phase constitution.

**1. Place (41 points, noted 11 times, 6 of which were first place):**

**The development of a microstructural atlas of the latest heat-resistant centrifugally casting alloys.**

**Ellen Berghof-Hasselbächer, Prof. Dr. Michael Schütze, Monika Schorr, Peter Gawenda, DECHEMA e.V. Karl-Winnacker-Institut, Frankfurt am Main, Germany.  
John J. Hoffman, Air Products and Chemicals Inc. Allentown, USA.**

One of the most common comments concerning metallographic microstructural images is: “interesting, but what am I actually looking at?” This question, posed by laymen, is understandable. However, even for professionals, it is sometimes difficult to find one’s way through the jungle of phases and precipitates. Microstructural atlases, which have been given the task to extensively describe a materials group in differing treatment and aging conditions, are a very helpful tool for the identification and description of microstructures.

The authors of the first placed article from last year have made a very worthy contribution to professional metallographic reading with the creation of a microstructural atlas for the latest heat-resistant centrifugally casting alloys.

Anyone who has performed similar investigations knows the immense amount of work behind this project. The microstructures documented in the atlas are the result of various investigations on around 60 metallographic sections, which had to be ideally conducted at the same location on each sample. Between the individual documentation steps, it was necessary to re-polish the metallographic sections, which led to the removal of even the smallest particles, so that reproducibility of the image section no longer prevailed. For the authors this meant only one thing: starting all over again with the metallographic section.

The reward, which is certainly not granted to each and everybody, is when, after four years work, one’s own name embellishes the completed book. The efforts and the considerable results were honoured by the jurors from the Buehler Best Paper Awards and awarded with the first prize.