

The 3rd Asian Thermal Spray Conference



06 November – 07 November 2008

Nanyang Executive Centre

SINGAPORE

Organised and Sponsored By:

Institute of Materials (East Asia)

Supported By:

Nanyang Technological University, Singapore

Scope

The 3rd Asian Thermal Spray Conference (3rd ATSC 2008) will be held from **November 06 ~ 07, 2008**. It is organised and sponsored by the Institute of Materials (East Asia) and supported by Nanyang Technological University, Singapore. The ATSC 2008 will be the best forum to exchange ideas and information of all aspects of thermal spraying in Asia. Nanyang Technological University (NTU) is a research-intensive university with globally acknowledged strengths in science and engineering. It remains the tertiary institution in Singapore with a leading thermal spray research program. The sessions will cover both fundamental research and the industrial applications of thermal spray process.

- Plenary Program
- Applications & Properties
- Equipment & Processes
- Modeling and Simulation
- Economic & Regulatory
- Kinetic spray
- Biomedical Coating
- Materials synthesis by thermal spray, etc
- Poster Session

Conference Chairman



K. A. Khor
School of Mechanical & Aerospace Engineering,
Nanyang Technological University, Singapore
President, Institute of Materials (East Asia)

Asian Thermal Spray Conference Organising Committee

Prof. M. Fukumoto	Toyohashi University of Technology (Japan)
Prof. R. Kawase	Ariake National College of Technology (Japan)
Mr. Y. Tateishi	SHINCO METALICON Co.,Ltd. (Japan)
Prof. C-J Li	Xi'an JiaoTong University (China)
Dr. M. Liu	Guangzhou Research Institute of Nonferrous Metals (China)
Prof. Y-G Yu	Beijing General Research Institute of Mining and Metallurgy (China)
Dr. S. Y. Hwang	RIST (Korea)
Prof. K. H. Baik	Chungnam National University (Korea)
Prof. C. H. Lee	Hanyang University (Korea)
Prof. K. A. Khor	Nanyang Technological University (Singapore)
Prof. P. Cheang	Nanyang Technological University (Singapore)

**Programme Schedule for
The 7th International Conference on Materials Processing for Properties
and Performance (MP³ 2008)**

and

The 3rd Asian Thermal Spray Conference

Day 1: 05 November 2008, Wednesday

Time	Programme
14:00-18:00	Registration, Venue: Auditorium Foyer
18:00-20:00	Reception

Day 2: 06 November 2008, Thursday

Time	Programme			
09.00-09.10	Welcome notes from conference chairmen; Venue: Auditorium			
09.10-09.50	Plenary Talk, Dr G Sundararajan: Cold Spray Coating Technology: Recent Developments at ARCI			
09.50-10.10	Tea break			
	Room: LR1	Room: LR2	Room: Auditorium Foyer	
10.10-12.10	MIDAS1	AMFT1	ATSC Registration	
12.10-13.00	LUNCH			
	Room: LR1	Room: LR2	Room: LR4	Room: LR5
13:00-15:30	BM1	AMFT2	ATSC1	
15.30-15.50	Tea break			
15:50-18:10	BM2	AMFT3	ATSC2	
19:00 -21:00	Banquet			

Day 3: 07 November 2008, Friday

Time	Programme			
	Room: LR1	Room: LR2	Room: LR4	Room: LR5
08.30-10.40	MIDAS2	AMFT4	ATSC3	ATSC7
10.40-11.00	Tea break			
11.00-12.10	MIDAS3	AMFT5	ATSC4	ATSC8
12.10-13.00	Lunch and Poster Session			
	Room: LR1	Room: LR2	Room: LR4	Room: LR5
13.00-16.00	MIDAS4	AMFT6	ATSC5	ATSC9
16.00-16.20	Tea break			
16.20-17.30		AMFT7	ATSC6	ATSC10

Note: Auditorium and Auditorium Foyer, level 2, Nanyang Executive Centre;
LR1&2: Lecture Room 1 and 2, Level 2, Nanyang Executive Centre;
LR4&5: Lecture Room 4 and 5, Level 3, Nanyang Executive Centre,
Nanyang Executive Centre, 60 Nanyang View, Singapore 639673

Location map: <http://www.ntu.edu.sg/nec/PublishingImages/roadmapforneconblack.pdf>

Day 1: 06 Nov. 2008, Thursday

09.00-09.10 Welcome notes from conference chairmen

09.10-09.50 Plenary Talk by **Dr Sundararajan, Cold Spray Coating Technology: Recent Developments at ARCI**, *International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), India*

10.00-12.00 Registration

12.00-13.00 LUNCH

Session Chair: **Yasutaka Ando and Hiroyuki Waki** Room: **Lecture Room 4**

13.00-13.30

ATSC-1002 (Invited), **M. Ghosh**

A Comparative Study on The Ageing Behaviour of Solder Alloy-Cu Joint Assembly Using Lead Free Solder and Sn-Pb Eutectic Solder Alloy, *Material Science & Technology Division, National Metallurgical Laboratory (CSIR), India*, M. Ghosh, A. Kar, S.K. Das, R. N. Ghosh and A.K. Ray

13.30-14.00

ATSC-1034 (Invited), **Toshiaki Yasui**

Low power plasma spraying using atmospheric pressure microwave plasma, *Toyohashi University of Technology, Japan*, Toshiaki Yasui, Katsuhiko Tsujimoto, and Masahiro Fukumoto

14.00-14.30

ATSC-1005 (Invited), **Fuxing YE**

Characterization of Atmospheric Plasma Sprayed Fe-based Amorphous Coatings, *Tianjin University, China; Osaka University, Japan*, Fuxing Ye, Luofu Liu, Chong Cui and Kazuhiro Nakata

14.30-15.00

ATSC-1036 (Invited), **Yasutaka Ando**

Rapid diamond deposition by combustion flame method using twin gas torch, *Ashikaga Institute of Technology, Japan*, Yasutaka Ando, Shogo Tobe, Hirokazu Tahara

15.00-15.30

ATSC-1006 (Invited), **Hiroyuki Waki**

Effects of thermal treatment on high temperature mechanical properties of LPPS, HVOF and APS CoNiCrAlYs, *Faculty of Engineering, Dept. of Mechanical Engineering, Osaka Electro-Communication University, Japan*, Hiroyuki Waki, Takeshi Kitamura, Yuusuke Matsuda, Akira Kobayashi

15.30-16.00 Tea break

16.00-16.30

ATSC-1007 (Invited), **Hyung-Jun Kim**

Study on binary Al-Sn coatings by cold spray deposition, *Research Institute of Industrial Science & Technology, Korea*, Hyung-Jun Kim, Xian-Jin Ning, Jin-Hong Kim, Changhee Lee

16.30-17.00

ATSC-1008 (Invited), **Hyun-Kwang Seok**

The Effect of Processing Routs on the Mechanical Property and Bio-Compatibility of HA/Ti

Gradient Coatings, *Advanced Functional Materials Research Center, Korea Institute of Science & Technology, Korea*, Hyun-Kwang Seok, Eun Hye Kim, Seung Hee Han

17.00-17.30

ATSC-1009 (Invited), **Xiaojuan Ji**

Preparation of yttria powders for thermal spraying, *Sub-Institute of Metal Materials, Beijing General Research Institute of Mining and Metallurgy, China*, Ji xiaojuan, Huang xinchun, Li zhenduo, Ren xianjing

17.30-17.50

ATSC-1065 (Oral), **S.M. Ang**

Development and characterization of cold sprayed nanostructured WC-Co coatings, *Singapore Technologies, Kinetics, Singapore*, S.M. Ang, W.Y. Lee, K.W. Kwok, H.N. Cheang

19:10 -21:00 **Banquet**

Day 2: 07 Nov. 2008, Friday

Session Chair: **Junya Kitamura and Bala Kandasubramanian**

Room: **Lecture Room 4**

08:30-09:00

ATSC-1015 (Invited), **Bala Kandasubramanian**

Blown film extrusion of blends and compounds of polyolefin for synthetic paper applications, *UK Materials Technology Research Institute, UK*, Bala Kandasubramanian & D.D. Kale

09:00-09:30

ATSC-1016 (Invited), **Bala Kandasubramanian**

Nanohybrid composite bipolar plates of poly (ethersulphones) for Proton Exchange Membrane (PEM) fuel cell, *UK Materials Technology Research Institute, UK*, Bala Kandasubramanian

09:30-10:00

ATSC-1018 (Invited), **Kazuhiro OGAWA**

Fundamental Study on Repairing Cracked or Damaged Parts of Steel Structures using Cold-spray Technique, *Fracture and Reliability Research Institute, Tohoku University, Japan*, Kazuhiro OGAWA, Satoshi AMAO, Yuji ICHIKAWA, Hiroataka FUKANUMA

10:00-10:20

ATSC-1014 (Oral), **Junya Kitamura**

Development of WC-Co Coatings Deposited by Warm Spray Process, *Fujimi Incorporated, Japan*, Pornthep Chivavibul, Makoto Watanabe, Seiji Kuroda, Jin Kawakita, Masayuki Komatsu, Kasuto Sato, Junya Kitamura

10:20-10:40

ATSC-1019 (Oral), **Kazuto Sato**

Comparative Study between Hard Metal and HVOF Coating on WC/Co, *Fujimi Incorporated, Japan*, Kazuto Sato, Hiroaki Mizuno, Junya Kitamura

10.40-11.00 Tea Break

11.00-11.30

ATSC-1040 (Invited), **Yuta Shimizu**

Elucidation of Glassy Alloy Coating by High Velocity Oxy-Fuel (HVOF) Spraying, *Topy Industries Limited, Japan*, Y. Shimizu, K. Nakashima, M. Sugiyama, T. Igarashi, M. Fukumoto, H. Kimura, A.

Inoue

11:30-11:50

ATSC-1035 (Oral), **Yasunari Ishikawa**

Evaluation of decidual particle from thermal sprayed coating by the rolling friction test at high temperature, *Asahi Glass Co., Ltd, Japan*, Y.Ishikawa, K.Hamashima

11:50-12:10

ATSC-1051 (Oral), **Kyeong-Ho Baik**

Gas permeability and electrical conductivity of ceramic interconnectors for SOFCs, *Department of Nanomaterials Engineering, Chungnam National University, Korea*, Kyeong-Ho Baik, Kyeong-Tae Ihm

12:10-13:00 LUNCH and Poster Session

Session Chair: **G. Sundararajan and Cheang Hong Ning, Philip** Room: **Lecture Room 4**

13:00-13:30

ATSC-1041 (Invited), **Cheng-cai ZHU**

Influence of one new additive on oxygen content of NiCr alloy powder, *Beijing General Research Institute of Mining and Metallurgy, China*, ZHU Cheng-cai, Xiao Ning, TIAN Yu-liang Yue Lan

13:30-14:00

ATSC-1042 (Invited), **Jia ZHU**

New Ways of Turbine Seal, *Beijing General Research Institute of Mining and Metallurgy, China*, ZHU Jia, ZHANG Xin

14:00-14:30

ATSC-1044 (Invited), **Xiao-dong ZHAO**

Study on Nano Particles of Lanthanum Zirconate and its plasma-sprayed coatings, *Beijing General Research Institute of Mining and Metallurgy, China*, ZHAO Xiao-dong, ZENG Ke-li, XIE Jian-gang, MA jiang-hong, SONG xi-jian, REN xian-jing, YU yue-guang

14:30-15:00

ATSC-1045 (Invited), **Yong San Tao**

EIS investigation on cold sprayed Al/a-Al₂O₃ deposits on AZ91D alloy, *Institute of Metal Research Chinese Academy of Sciences, China*, Tao Yong San

15:00-15:20

ATSC-1052 (Oral), **Changhee Lee**

Soldering and erosion protection of die components in high-pressure die-casting via kinetic spray technique, *Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea*, Faisal Farooq Khan, Gyuyeol Bae, Kicheol Kang, Changhee Lee

15:20-15:40

ATSC-1053 (Oral), **Changhee Lee**

Role of roughness induced frictional dissipation in kinetic spray bonding mechanism, *Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea*, S. Kumar, Gyuyeol Bae, Hyuntaek Na, Changhee Lee

15:40-16:00

ATSC-1054 (Oral), **Changhee Lee**

Strain enhanced nucleation of Nanocrystalline of bulk metallic glasses in kinetic spray process, *Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea*, Sanghoon Yoon, Gyuyeol Bae, Yuming Xiong, Junghwan Kim, Changhee Lee

16.00-16.20 Tea break

16.20-16.40

ATSC-1060 (Oral) , **G. Sundararajan**

Effect of Process Parameters and Heat Treatments on the Properties of High Conductivity Cold Sprayed Silver Coatings, *International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), India*, Naveen Manhar Chavan, P. Sudharshan Phani, D. Srinivasa Rao and G. Sundararajan

16:40-17:00

ATSC-1062 (Oral) , **G. Sundararajan**

Comparison of Plasma and Detonation Sprayed Low Alloy Steel Coatings for Tribological Applications, *International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), India*, S.V.Joshi and G.Sivakumar

17:00-17:30

ATSC-1059 (Invited) , **Zhensu Zeng**

In-flight Oxidation and Vaporization of NiCrSiB and Ni-Cr Alloys in Air Plasma Spray, *National Institute for Materials Science, Composites & Coating Center, Japan*, Zhensu Zeng, Seiji Kuroda, Jin Kawakita, Masayuki Komatsu, Hidenori Era

Parallel Sessions

Day 2: 07 Nov. 2008, Friday

Session Chair: **Masato Suzuki and Motohiro Yamada**

Room: **Lecture Room 5**

08:30-09:00

ATSC-1020 (Invited), **Kee Hyun Kim**

Jetting-outs of single titanium particle deposited by Warm Spray process and substrate, *Composites and Coatings Center, National Institute for Materials Science (NIMS), Japan*, KeeHyun Kim, Makoto Watanabe, Kazutaka Mitsuishi, Konstantin Iakoubovskii, and Seiji Kuroda

09:00-09:30

ATSC-1021 (Invited), **Zhenduo Li**

Research on preparation of high crystallinity degree hydroxyapatite powder for biological coating, *Beijing General Research Institute of Mining & Metallurgy, China*, Li Zhenduo; Zhan Jia; Zhou Heng; Chen Meiyang

09:30-10:00

ATSC-1023 (Invited), **Masahiro Fukumoto**

Effect of ambient pressure on flattening behavior of thermal sprayed particle, *Toyohashi University of Technology, Japan*, M. Fukumoto, K. Tomita, K. Yang, M. Yamada and T. Yasui

10:00-10:30

ATSC-1024 (Invited), **Masato SUZUKI**

Suspension Plasma Spraying of Oxide Ceramic with Twin-Cathode Type Plasma Spray Gun, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*, Masato SUZUKI and Yoshifumi TSUTAI

10:30-11:00

ATSC-1025 (Invited), **Motohiro Yamada**

Fabrication of Metallic Glass Coatings by APS and Evaluation of its Property, *Toyohashi*

University of Technology, Japan, Motohiro Yamada, W. Fujiyama, Y. Okuwa, M. Fukumoto, Y. Motoe, K. Nakashima, T. Igarashi

11.00-11.20 Tea Break

11.20-11.50

ATSC-1026 (Invited), **Motohiro Yamada**

Evaluation of cold sprayed copper particles, *Toyohashi University of Technology, Japan*, Motohiro Yamada, Masahiro Mashiko, Kazunori Sato, Masahiro Fukumoto and Eiji Yamaguchi

11.50-12:20

ATSC-1027 (Invited), **Qumrul Ahsan**

Mechanical Behavior of Polyester-based Woven Jute/Glass Hybrid Composites, *Department of Materials and Metallurgical Engineering BUET, Dhaka*, Qumrul Ahsan and Sohanazaman Tanju

12.20-13.00 LUNCH and Poster Session

Session Chair: Kazuya Iwata and Yuta Shimizu

13:00-13:30

ATSC-1028 (Invited), **Ryoichi Kawase**

Development of Fluoropolymer/Alumina Composite Coatings Using Thermal Spray Technology, *Ariake National College of Technology, Japan*, Ryoichi Kawase and Yasunori Tanaka

13:30-14:00

ATSC-1029 (Invited), **Byeong-Geun Seong**

Arc-spray Rapid Tooling for Sheet Metal Forming, *Fuel Cell Project, Research Institute of Industrial Science & Technology, Korea*, Byeong-Geun Seong, Jin-Hong Kim, Jee-Hoon Ahn, Kyung-Ho Baik

14:00-14:30

ATSC-1030 (Invited), **S. Hirose**

Relationship Between Film Quality of Wear Resistive Al₂O₃ and Atmosphere Plasma Spraying Parameters Analyzed by Analytic Hierarchy Process, *National Institute of Advanced Industrial Science and Technology (AIST), Japan*, S. Hirose, S. Kitahara, K. Sonoya, A. Ohmori and K. Mori

14:30-15:00

ATSC-1038 (Invited), **Kazuya Iwata**

Graphite Structure in Coatings by Plasma Spraying with Iron Powder and Suspension, *Toyota Technological Institute, Japan*, Kazuya Iwata, Cagri Tekmen, Yoshiki Tsunekawa, and Masahiro Okumiya

15:00-15:30

ATSC-1032 (Invited), **Sik-Chol Kwon**

Improvement of Coating Uniformity over Corrugated Surface by Micro Plasma Spray, *Surface Technology Research Department, Korea Institute of Materials Science (KIMS) Korea*, Sik-Chol Kwon, Jang-Won Moon, Jong-Joo Rha, Eung-Sun Byon, Koo-Hyun Lee

15:30-16:00

ATSC-1033 (Invited), **Soon Young Hwang**

Recent developments of laser spraying and some application to industrial areas, *Research Institute of Industrial Science and Technology (RIST), Korea*, Soon Young Hwang and Sun Hong Park

16:00-16:30 Tea Break

16:30-16:50

ATSC-1011 (Oral), **Junya Kitamura**

HVOF sprayed coatings by customized cermet materials for specific applications, *Fujimi Incorporated, Japan*, Junya Kitamura, Hiroaki Mizuno, Kazuto Sato, Satoshi Tawada

16:50-17:10

ATSC-1012 (Oral), **Junya Kitamura**

Plasma sprayed coatings of high purity ceramics for semiconductor and flat panel display production equipments, *Fujimi Incorporated, Japan*, Junya Kitamura, Hiroyuki Ibe, Kazuto Sato, Hiroaki Mizuno

17:10-17:30

ATSC-1013 (Oral), **Junya Kitamura**

Mechanical properties of WC/Co coatings prepared by cold spraying, *Fujimi Incorporated, Japan*, Junya Kitamura, Kazuto Sato, Isao Aoki, Kazuhiko Sakaki, Muneaki Takahata and Yasuo Shimizu

Poster Session: 07th November, 2008, 12:10-13:00 PM

Poster for Asia Thermal Spray Conference

ATSC-1037, Yasutaka Ando

Crystallization of amorphous atmospheric thermal plasma CVDed TiO₂ film by laminar flow Ar thermal plasma jets in open air, Department of Mechanical Engineering, Faculty of Engineering, Ashikaga Institute of Technology, Japan, Katsumasa Sasou, Hideki Ninomiya, Takuya Nakamura, Yasutaka Ando, Shogo Tobe

ATSC-1046, Kyeong-Ho Baik

Plasma etching resistance of Al₂O₃-ZrO₂ coatings against CF₄+O₂, Department of Nanomaterials Engineering, Chungnam National University, Korea, Bo-Kyeong Seo, Kyeong-Ho Baik

ATSC-1047, Kyeong-Ho Baik

Oxidation and electrical conductivity of LCCC coatings on Fe-Cr metallic interconnector, Department of Nanomaterials Engineering, Chungnam National University, Korea, Chung-Hwan Lee, Kyeong-Ho Baik

ATSC-1048, Kyeong-Ho Baik

Synthesis and microstructural features of AlN coatings by vacuum cold spraying, Department of Nanomaterials Engineering, Chungnam National University, Korea, Chang-Hyun Park, Kyeong-Ho Baik

ATSC-1049, Kyeong-Ho Baik

Synthesis and microstructural features of W-ZrC coatings by atmospheric plasma spraying, Department of Nanomaterials Engineering, Chungnam National University, Korea, Joo-Hyun Im, Kyeong-Ho Baik

ATSC-1050, Kyeong-Ho Baik

Gas tightness and ionic conductivity of YSZ coatings produced by atmospheric plasma spraying, Department of Nanomaterials Engineering, Chungnam National University, Korea, Jang-Hwan Moon, Kyeong-Ho Baik, Byeong-Geun Seong

ATSC-1055, Changhee Lee

Particle size and temperature effect on deposition characteristics of kinetic sprayed titanium coating, Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea, Gyuyeol Bae, S. Kumar, Hyuntaek Na, Changhee Lee

ATSC-1056, Changhee Lee

Optimized manufacturing process of diamond abrasive wheel through atmosphere plasma spray process, Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea, Hyuntaek Na, S. Kumar, Junghwan Kim, Hyungjun Kim, Changhee Lee

ATSC-1057, Changhee Lee

The electrical and mechanical properties of kinetic sprayed multi-walled carbon nanotube aluminum composite coating, Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea, Kicheol Kang, Yuming Xiong, Changhee Lee

ATSC-1058, Changhee Lee

The fabrication of carbon nanotube reinforced copper coating by a kinetic spray process, Kinetic Spraying Coating Laboratory (NRL), Division of Materials Science & Engineering, Hanyang University, Korea, Yuming Xiong, Kicheol Kang, Changhee Lee