Plasma Giken: Thermal Spray Solutions Since 1980

Nate Dennehy

Plasma Giken USA

PLASMA GIKEN
INDUSTRIAL COLD SPRAY

History of Plasma Giken

- Incorporated in 1980
- Fully owned and operated by President Hirotaka Fukanuma
- Started as thermal spray job shop with specialization in plasma spray
- Expanded to include HVOF, wire, detonation, pre- and post-machining
- From 2001 worked to develop cold spray as a commercial enterprise
- Now has cold spray systems installed in Canada, USA, Singapore, Australia, and Japan.

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Plasma Giken Co., Ltd.

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Plasma Giken USA

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Enter Plasma Giken USA

Plasma Giken Co. Ltd.

Tokyo, Japan

- Foundation: 1980
- Technological Competencies:
  - Thermal Spray Job Shop
  - Thermal Spray Engineering
  - Open Laboratory
  - Thermal Spray Equipment Sales

Plasma Giken USA

Webster, MA, USA

- Foundation: 2012
- Technological Competencies
  - Cold Spray Engineering
  - Collaborative Application Development
  - Open Laboratory
  - Cold Spray Equipment Sales

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ColdSpray PCS-1000

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System Overview

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Cold Spray Equipment Development

Model	Year	Description of Work
PCS-101	2001~2004	First generation system heats to 500ºC, suffers from problems with clogging
PCS-201	2005~2006	Chamber temperature rises to 800ºC
PCS-202	2006~2008	Extending residence time of particles in high temperature gas stream improves coating quality
PCS-302	2008~2009	Chamber temperature increased to 1000ºC
PCS-303	2009~2010	Clogging minimized with proprietary nozzle materials and design
PCS-304	2010~2011	Water cooling developed to further minimize clogging
PCS-305	2011-2012	Chamber dimensions optimized to obtain more efficient system start up
PCS-1000 PCS-800	2012-2013 2012-2013	Full commercial release of standard PCS-1000 and PCS-800.

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Integrated Heater/Gun

- Max temp: 1000℃
- Max pressure: 5MPa
- Modular nozzle interface with multiple nozzles based on spray materials
- No clogging with wide range of materials
- High volume production

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Why Multiple Nozzles?

Note: videos available at
www.plasmagiken.com

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CP Ti sprayed at 750g/min

This pure Titanium coating was sprayed with N2 at 1000℃ and 3MPa to a thickness of 14mm… in 17 seconds.

Note: videos available at www.plasmagiken.com

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Powder Feeders

- Very stable at high and low feed rates
- 3 sizes
  - 0.5L
  - 2.5L
  - 15L

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Gas Unit/Controller

- Runs He and N2
- Contains signal interfaces that run to the touch panel interface

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Touch Panel

- All System Readouts and Interfaces accessible
- Logging data automatically recorded

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SOME NOTES ON COLD SPRAY PRODUCTION

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Cold Spray Production

Note: videos available at
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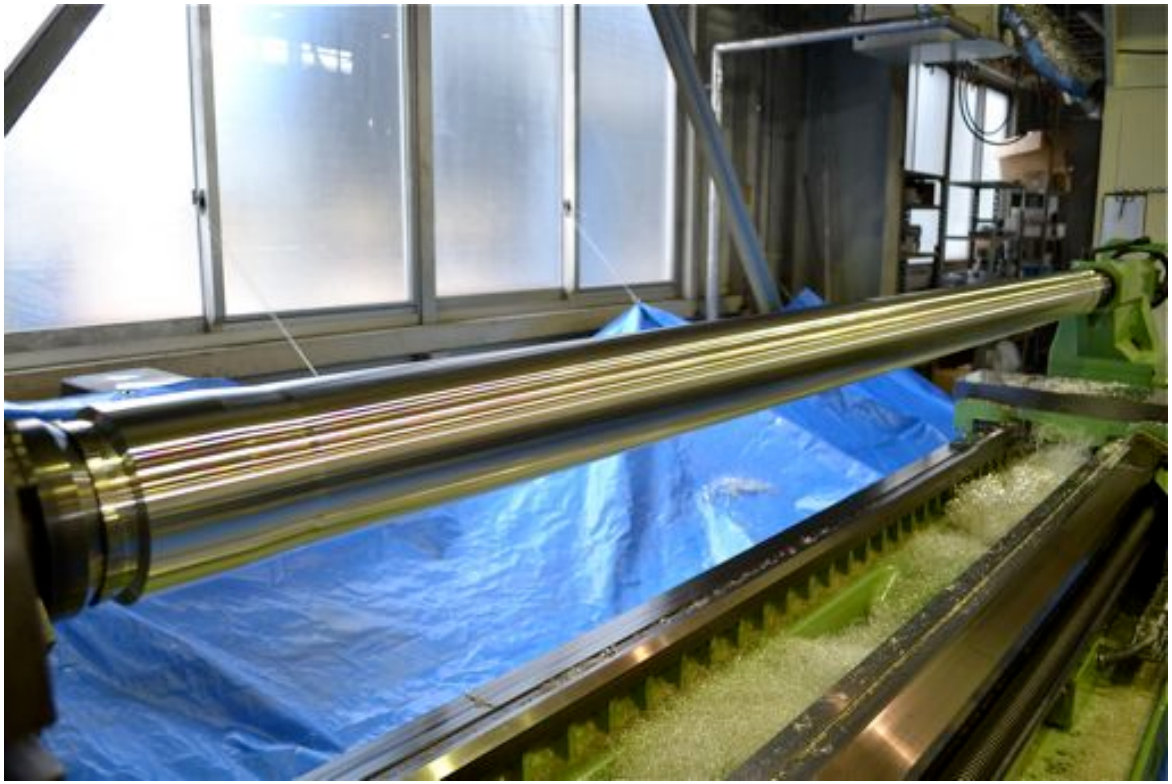
Sputtering Target

Ag Coating



Ti Coating

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COLD SPRAY TESTING

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Coating Characterization and Quality Control

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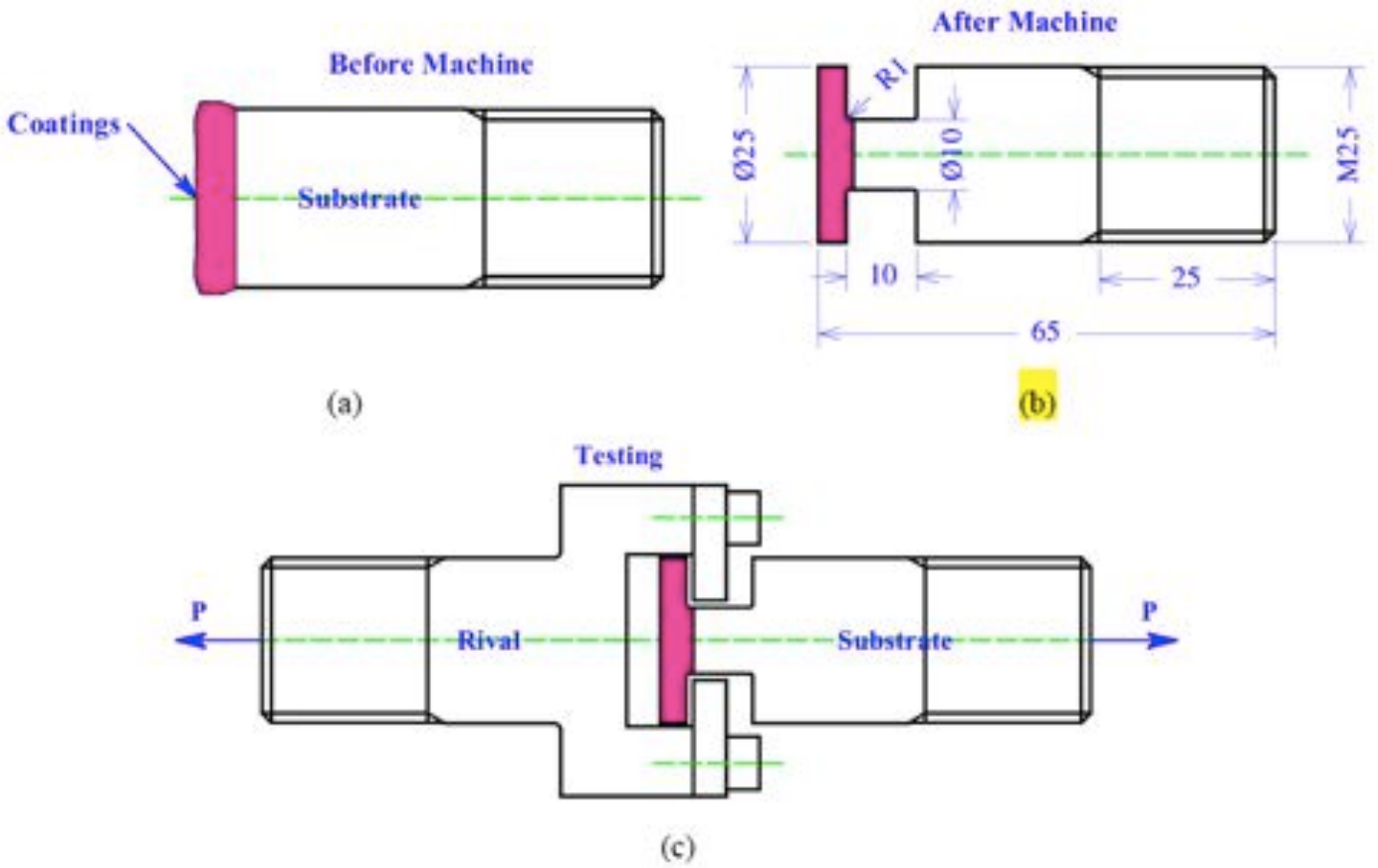
Coating Characterization and Quality Control



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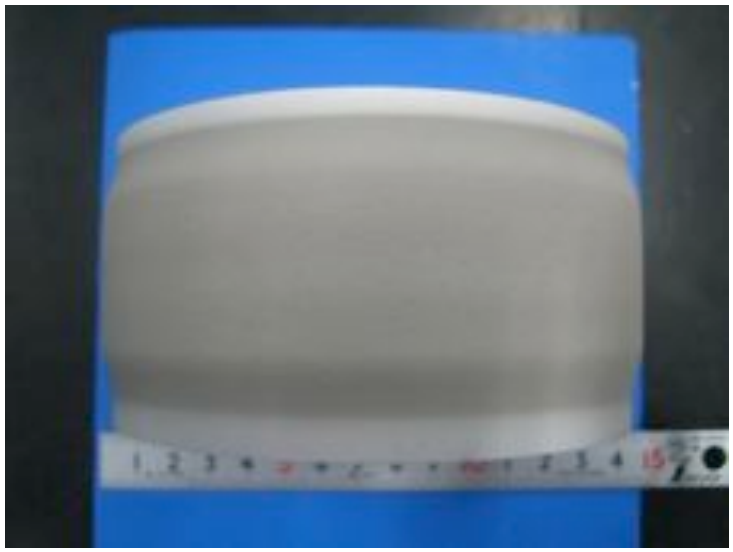
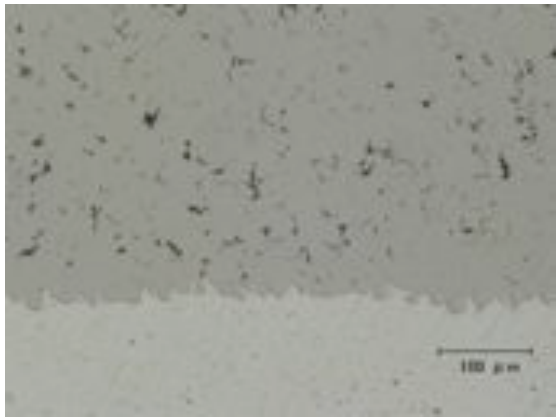
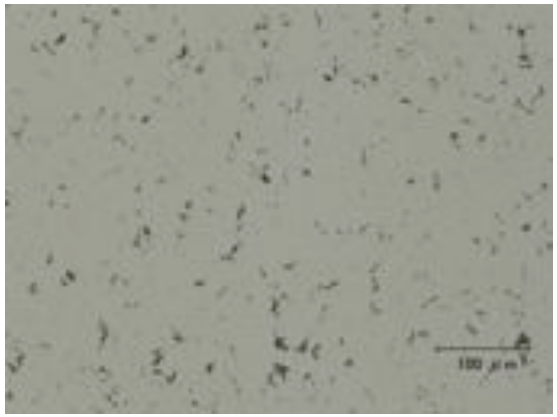
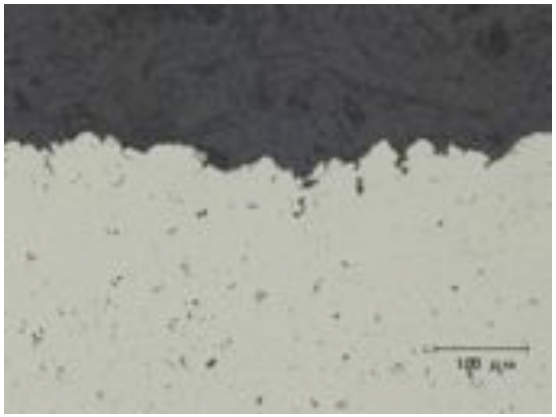
Inconel 718

N2 – 1000ºC – 5MPa
Powder Size: -25/+5µm
DE: 69%









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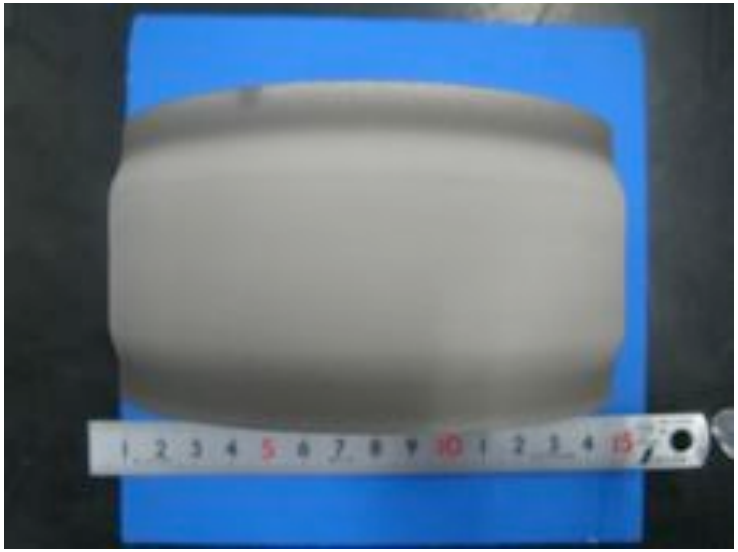
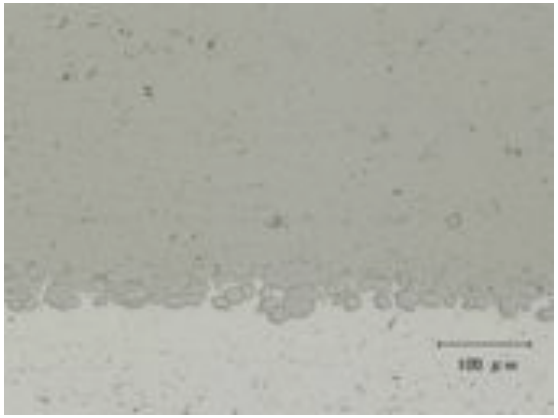
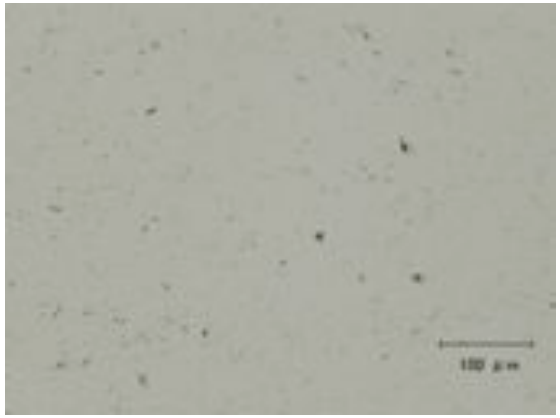
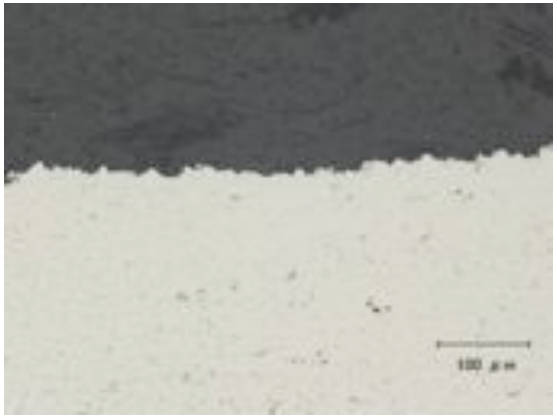
Inconel 718

He – 1000ºC – 4MPa
Powder Size: -25µm
DE: 81%









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OPEN LABORATORY

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Come to Our Open Laboratory

Plasma Giken's Open Laboratory is available for daily rental to test your applications with our equipment, hand in hand with one of our operators.

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Come to Our Open Laboratory

Note: videos available at
www.plasmagiken.com

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Plasma Giken is Making Industrial Cold Spray A Reality

We’re looking forward to working with you on your applications.

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