

# Details of a Researcher

\* [Japanese](#) \*

Faculty of Engineering Division of Materials Science and Chemical Engineering Professor  
TAKAHASHI Koji  
male

## Other organizations

- Graduate School of Engineering Division of Material Science and Engineering  
Specialization in Chemical and Energy Engineering
- College of Engineering Science Department of Chemistry, Chemical Engineering and  
Life Science Chemistry Applications Program

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<http://www.ktakahashi.ynu.ac.jp/>

## Linking to YNU-Repository

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 Resolver(KAKEN,CiNii, researchmap)

 ORCID

## School Attended (except graduate school)

Kyushu University, Faculty of Engineering  
1995, Graduated

## Graduate School Attended, etc.

Kyushu University, Graduate School, Division of Engineering  
• 2000, Completed

## Research Career

Professor, Yokohama National University, 2012/01 – Ongoing

- Associate professor, Yokohama National University , 2007/04 – 2011/12
- Associate professor, Yokohama National University , 2005/01 – 2007/03
- Lecturer, Yokohama National University , 2003/01 – 2004/12
- Research associate, Yokohama National University , 2001/03 – 2002/12

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## Career Research

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- 1997–2000 Effects of small defects on biaxial fatigue strength of metals 2001–Crack–healing behavior of structural ceramics
- 2001– Failure behavior of pipes having local wall thinning 2001–Increasing fatigue strength of car components

## Research Field (grants-in-aid-for-scientific-research classification)

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Materials/Mechanics of materials

- Structural/Functional materials

## Current Subject

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- Improvement of fatigue strength of metals and acceptable surface defects by mechanical surface treatment  
fatigue strength , surface treatment
- Self–crack–healing behavior of ceramics during service  
self–crack–healing
- Improvement of reliability in ceramics by shot peening and crack–healing  
crack–healing , shot peening
- Effects of overload on fatigue strength and SCC behavior of metals overload ,  
fatigue strength , stress corrosion cracking
- Structural integrity of local wall thinned piping against seismic loading pipe ,  
local wall thinning , finite element method

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## Details of Research

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- **Increasing fatigue strength of metals and ceramics by mechanical surface enhancement technologies** Increasing of fatigue strength of metals leads to improvement of fuel efficiency and the life span of transport equipment. The small surface defects affects fatigue strength of metals. If these small surface defects have been rendered harmless thorough the mechanical surface enhancement technologies, the reliability of a material

can be increased. We are studying on surface defects harmless for metals and ceramics through mechanical surface enhancement technologies, such as shot peening and laser peening.

**Crack–healing behavior of structural ceramics** Some engineering ceramics have a crack–healing ability. The use of this self crack–healing ability on structural components in engineering applications may produce great benefits such as an increase in the reliability of structural ceramic members and a decrease in the inspection, machining, and polishing costs of ceramic components. We investigated the crack–healing behaviors of engineering ceramics which all have high self–crack–healing abilities. For example, we have studied the following items; (i) the best healing conditions for high–temperature strength, (ii) the maximum healable crack size, and (iv) the crack–healing behavior under stress.

**Failure behavior of pipes having local wall thinning** Carbon steel pipes are commonly used in the piping systems of power plants. Erosion/corrosion can cause a wall thinning due to high temperature and high pressure water and steam flowing at high velocities through these pipes. Therefore, it is important to evaluate the strength of piping undergoing local wall thinning in order to maintain the integrity of the piping systems. In order to investigate the fracture behaviors of pipes undergoing local wall thinning, we are carrying out monotonic four–point bending tests and finite element (FE) analyses using test pipes having local wall thinning.

## Research Achievement (Book)

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- Handbook of Smart Coatings for Materials Protection, Chapter 22: Structural ceramics with self–healing properties (K. Ando, K. Takahashi, T. Osada)  
Woodhead Publishing (p.586–605) 2014/02
- Advances in ceramics matrix composites, Chapter 17: Self–crack–healing behavior in ceramics matrix composites  
(T. Osada, W. Nakao, K. Takahashi, K. Ando)  
Woodhead Publishing (p.410–441) 2014/01
- Advances in Ceramics, Chapter 18: Crack–Healing Ability of Structural Ceramics and Methodology to Guarantee the Reliability of Ceramic Components  
(Koji Takahashi, Kotoji Ando, Wataru Nakao) In  
Tech (p. 351–370) 2011/08
- Advanced Nanomaterials, Chapter 17: Self–healing of Surface Cracks in Structural Ceramics  
(W. Nakao, K. Takahashi, K. Ando)

WILEY-VCH vol.2 (p. 555–593) 2010/02

- Handbook of Nanoceramics and Their Based Nanodevices, Vol.3, Chapter 1, Self-Crack-Healing Behavior of Structural Ceramics, (Kotoji Ando, Koji Takahashi, Wataru Nakao)  
American Scientific Publishers vol.3 (p. 1–26) 2009/01

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## Research Achievement (Published Thesis)

Increased fatigue strength of partially stabilised zirconia achieved by shot peening

(Koji Takahashi, Kae Iwanaka, Hitonobu Koike)

Materials Science and Technology vol.33 (5) (p.623–628) 2017/02

[Other](#)

- Increase in Strength of Partially Stabilized Zirconia After Shot Peening (Koji Takahashi, Kae Iwanaka, Toshio Osada, Hitonobu Koike)  
Journal of Materials Engineering and Performance vol.24 (9) (p.3573–3578) 2015/08

- [Web of Science<sup>SM</sup>](#) [YNU-R](#) [Other](#)  
Fatigue Limit Prediction and Estimation for the Crack Size Rendered Harmless by Peening for Welded Joint Containing a Surface Crack (Ryutaro Fueki, Koji Takahashi, Keiji Houjou)

Materials Sciences and Applications vol.6 (6) (p.500–510) 2015/06

[Other](#)

- Improvement of Fatigue Limit by Shot Peening for High-Strength Steel Containing a Crack like Surface Defect –Influence of Stress Ratio– (Jun Yasuda, Koji Takahashi, Hideki Okada)  
International Journal of Structural Integrity vol.5 (1) (p.45 – 59) 2014/03

[Other](#)

- Improvement of strength and reliability of ceramics by shot peening and crack-healing (K.Takahashi, Y. Nishio, Y. Kimura, K. Ando)  
Journal of the European Ceramic Society vol.30 (15)(p.3047–3052) 2010/09

[Web of Science<sup>SM</sup>](#) [YNU-R](#)

## Research Achievement (Review)

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- New Technology for Increasing Through–Life Reliability of Ceramics Components Using Self–Crack–Healing Ability  
(Kotoji Ando, Koji Takahashi, Wataru Nakao, Toshio Osada, and Kae Iwanaka )  
Journal of Powder Technology vol.2013 (p.937312) 2013/06

## Academic Society

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- The Japan Society of Mechanical Engineers The
- Society of Materials Science Japan Japan
- Society of Spring Engineers Japanese Society
- of Tribology
- High Pressure Institute of Japan

## Academic Awards Received

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- Award for distinguished service, Japan Society of Spring Engineers, 2016/11
- Science and Technology Award, High Pressure Institute of Japan, 2016/05
- Technological Progress Award, Yokohama National University, 2014/02 Best
- Teacher Award, Yokohama National University, 2011/05
- Prizes for Science and Technology, Research Category, The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, 2009/04

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## Past of Collaboration and Commissioned Research

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- Development of materials for high–temperature spring having excellent crack–healing ability and mechanical properties, 2004/07 – 2007/06, Others
- Fracture Behavior of Energy Plant Pipe with Local Wall Thinning, 2003/04 – 2005/03, International Cooperative Research

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