The International Symposium on New Refrigerants and Environmental Technology 2018

– Latest Technology of Energy Conservation, New Refrigerants and Environment issue on Air conditioning and Refrigeration Equipment for lead up to the 21st Century –

December 6 - 7, 2018
International Conference Center Kobe, Main Hall

**FINAL PROGRAM**

Thursday, December 6

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<td>8:00〜9:00</td>
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<td>9:00〜9:10</td>
<td><strong>Opening Address</strong></td>
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<td><strong>Opening Address (1)</strong> Toshiyuki Takagi, Chairman of the board, JRAIA</td>
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<td><strong>Opening Address (2)</strong> Masatoshi Omura (Executive director, KOBE Tourism Bureau)</td>
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| 9:10〜9:40  | **Keynote Address**                                        |
|            | *History of Kobe symposium and the latest issues of the HVAC Industries* |
|            | Tetsuji Okada (President, JRAIA)                          |

Main Moderator of Technical Session : Shigeharu Taira (Daikin Industries, Ltd.)

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<tr>
<td>9:45〜11:10</td>
<td><strong>Technical Session 1 : Environment issue</strong></td>
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<td>Moderator : Hisao Mizuno (Mitsubishi Heavy Industries Thermal Systems, Ltd.)</td>
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<td>Hisashi Otani (Sanden Advanced Technology Corporation)</td>
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<td><em>The Amendment of the Ozone Layer Protection Law – Measures against Fluorinated Gases in Japan –</em></td>
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<td>Toshio Kosuge (Minister of Economy, Trade and Industry (METI))</td>
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<td><em>The implementation of the F-gas regulation and the HFC phase-down in Europe</em></td>
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<td>Mihai Scumpieru (European Partnership for Energy and the Environment : EPEE)</td>
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<td><em>Update on Ecodesign and safety standards in Europe</em></td>
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<td>Els Baert (European Partnership for Energy and the Environment : EPEE)</td>
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<td><em>AHRI Research on Flammable Refrigerants</em></td>
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<td>Xudong Wang (The Air-Conditioning, Heating, and Refrigeration Institute : AHRI)</td>
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<td><em>Updates on Standards development and revision in China R&amp;AC Industry following Kigali Amendment</em></td>
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<td>Jingliang Chen, Huicheng Liu (China Refrigeration and Air Conditioning Industry Association : CRAA)</td>
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<td>11:15〜11:35</td>
<td><strong>Poster Session Presentation</strong></td>
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<td>Moderator : Shigeharu Taira (Daikin Industries, Ltd.)</td>
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| 11:35〜12:35| **Lunch Break**                                          |
12:35〜13:45  Technical Session 2 : New Refrigerants (Appliance Manufacturer) 1
Moderator : Shigeharu Taira (Daikin Industries, Ltd.)
   Koji Yamashita (Mitsubishi Electric Corporation)

**Performance analysis of lower GWP refrigerant for air-conditioning systems using Energy flow +M**
   ○ Kiyoshi Saito, Keisuke Ohno (Waseda University)

**Performance evaluation of VRF systems using low GWP refrigerant**
   Hiroichi Yamaguchi, ○ Atsushi Baba, Yoko Hattori (TOSHIBA CARRIER CORPORATION)

**Development of Hybrid VRF using R32 refrigerant**
   ○ Ikeda Soshi, Nishio Jun, Ishimura Katsuhiko, Okano Hiroyuki
   (Mitsubishi Electric Corporation)

**Development of an Air-source Heat Pump Using Low-GWP Refrigerants to Heat Circulation Water**
   ○ Kei Akatsuka, Takachika Mori (Mitsubishi Heavy Industries Thermal Systems, Ltd.)

13:45〜13:55  Refreshment Break

13:55〜15:05  Technical Session 3 : New Refrigerants (Appliance Manufacturer) 2
Moderator : Shigeharu Taira (Daikin Industries, Ltd.)
   Koji Yamashita (Mitsubishi Electric Corporation)

**Development of condensing units using R463A**
   ○ Yusuke Arii, Takashi Ikeda, Hiroshi Sata, Ryo Tsukiyama (Mitsubishi Electric Corporation)

**Development of scroll Condensing unit using R448A refrigerant**
   ○ Nobuyoshi Kawase, Masaki Uno, Masahiro Nishide, Atsuhiko Yokozeki, Hideyuki Ueda
   (Hitachi-Johnson Controls Air Conditioning, Inc.)

**Update on Next Generation Low GWP Refrigerants for Chillers Products**
   ○ Stephen A Kujak, Kenneth J Schultz (Ingersoll Rand - Trane)

**Development of Air-cooled Heat Pump Modular Chiller "HEXAGON FORCE 32" using Low GWP refrigerant HFC-32**
   ○ Minoru Sugimura, Kazuhisa Takemoto (Daikin Industries, Ltd.)

15:05〜15:15  Refreshment Break

15:15〜16:30  Technical Session 4 : Safety of Refrigerants / Risk Assessment 1
Moderator : Hiroichi Yamaguchi (Toshiba Carrier Corporation)
   Masayuki Nonaka (Hitachi-Johnson Controls Air Conditioning, Inc.)

**Safety and risk assessment of flammable refrigerants, A2L and A3**
   Eiji Hihara (The University of Tokyo)

**FLAMMABILITY EVALUATION OF LOCALIZED CLOUD OF LOWER FLAMMABILITY (2L) REFRIGERANT USING A LARGE VOLUME VESSEL - COMPARISON BETWEEN R32 AND R290**
   Kenji Takizawa (National Institute of Advanced Industrial Science and Technology : AIST)

**Physical hazard assessment for natural refrigerant assuming application to the room air conditioner**
   ○ Tomohiko Imamura*, Hiroyuki Takahashi**, Shuhei Maejima**, Osami Sugawa*
   (Suwa University of Science*, Tokyo University of Science, Suwa**)  

**The assessment of real scale physical hazard of residential use room air-conditioner using natural refrigerant**
   ○ Hiroumi Shina, Akira Matsugi, Tei Saburi, Sirou Kubota
   (National Institute of Advanced Industrial Science and Technology : AIST)

16:30〜16:40  Refreshment Break
16:40〜18:00  **Technical Session 5 : Safety of Refrigerants/ Risk Assessment 2**
Moderator : Hiroichi Yamaguchi (Toshiba Carrier Corporation)
Masayuki Nonaka (Hitachi-Johnson Controls Air Conditioning, Inc.)

Risk evaluation report of commercial packaged air conditioner for facilities using lower flammability refrigerants
◯ Masahiko Nakamoto, Akiyoshi Yamamoto, Hisao Ooishi, Syunji Sasaki,
Kazuhiko Kawai (Commercial A/C for facilities Risk Assessment SWG, JRAIA)

International safety standard revision situation for flammable refrigerants Progress of IEC / SC61D / WG16
Hitoshi Hashimoto (Refrigerants related to International Standards WG, JRAIA)

Overview: Risk Assessment of Mini-split Air Conditioners using A3 Refrigerant
◯ Kenji Takaichi, Shigeharu Taira, Atsushi Baba, Tsutomu Imoto, Syunji Itakura,
Hironori Mori, Hiroaki Makino (Mini-Split Risk Assessment WG3, JRAIA)

Risk Assessment of Built-in Refrigerated Display Cabinets using A3 Refrigerant
◯ Yoshihisa Sakamoto, Toshimasa Kato, Shigeki Ishihara, Akira Kobayashi,
Hidekazu Kainuma, Makoto sato, Katsuyuki Osawa, Hiroshi Nagai, Koji yamashita,
Masahiko Nakagawa (Built-in refrigerated display cabinet risk assessment WG3, JRAIA)

18:20〜20:20  **Welcome reception**
Room “Kairaku” Portopia Hotel (Main Building / B1F)
Friday, December 7

8:30～9:00  Registration

9:00～10:40  Technical Session 6: Compressor/Lubricant 1
Moderator: Akira Hiwata (Panasonic Corporation)
Takeshi Okido (JXTG Nippon Oil & Energy Corporation)

Development of Scroll Compressor for R32 Refrigerant
Hiroki Ikebe, Hiroshi Kitaura, Yasuhiro Murakami, Kazuhiko Matsukawa,
Yasuo Mizushima (Daikin Industries, Ltd.)

Development of R290 Variable Speed Scroll Compressor
Weihua Guo, Joe Healy, David Ayers (Emerson Climate)

Development of an Evolutionary Three-Dimensional Scroll Compressor
Takuma Yamashita*, Hajime Sato*, Takahide Ito*, Yoshiyuki Kimata**, Yohei Hotta**
(Mitsubishi Heavy Industries, Ltd.*, Mitsubishi Heavy Industries Thermal Systems, Ltd.**)

Compressor Technology and Sustainability
Oliver Javerschek (Bitzer Kuehlmaschinenbau GmbH)

Improvement of seizure properties on edge BELL-MOUTH geometry of journal bearing
Yoshinori Ishida*, Hatsuhiko Usami** (Panasonic Corporation*, Meijo University**)

Tribological Properties of Low-GWP HFO Refrigerant/oil Mixtures
Shinichiro Ido, Tatsuya Sasaki, Kota Mizuno, Shuhei Koyama
(Mitsubishi Electric Corporation)

10:40～10:50  Refreshment Break

10:50～12:15  Technical Session 7: Compressor/Lubricant 2
Moderator: Akira Hiwata (Panasonic Corporation)
Takeshi Okido (JXTG Nippon Oil & Energy Corporation)

Tribological Study on Polyol Esters under Low GWP Refrigerants
Yohei Shono, Takeshi Okido, Kiyomi Sakamoto (JXTG Nippon Oil & Energy Corporation)

12:15～13:15  Lunch Break
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<td>13:15 ~ 14:55</td>
<td>Technical Session 8: Energy Conservation</td>
<td>Moderator: Shuji Fukano (Mayekawa Mfg Co., Ltd.) Takeshi Watanabe (Daikin Industries, Ltd.)</td>
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<td>Development of CO₂ refrigeration and hot water supply system</td>
<td>Toyoaki Kiya, Osamu Kosuda (Panasonic Corporation)</td>
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<td>Development of Efficient Heat Pump System for EV/PHEV</td>
<td>Hiroyuki Kobayashi (DENSO CORPORATION)</td>
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<td>Achieving New Levels of Energy Efficiency and Sustainability with Opteon?</td>
<td>HFO Refrigerants and Blowing Agents in Appliance Applications Ernest B. Wysong, Harrison K Musyimi (The Chemours Company)</td>
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<td>Development of a Multi Package Air-conditioner “GREEN MULTI” using Low GWP refrigerant HFC-32</td>
<td>Takuya Kotani, Ryuuta Ohura (Daikin Industries, Ltd.)</td>
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<td>Development of High Efficiency Room Air Conditioner &quot;Eolia&quot; with double temperature air flow</td>
<td>Hiroshi Yamamoto, Kensuke Adachi, Hideyuki Kouno (Daisuke Kawazoe, Panasonic Corporation)</td>
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<td>14:55 ~ 15:05</td>
<td>Refreshment Break</td>
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<td>15:05 ~ 17:00</td>
<td>Technical Session 9: New Refrigerants (Refrigerant Manufacturer)</td>
<td>Moderator: Masami Taniguchi (Denso Corporation) Makoto Hayano (Fujitsu General Laboratories Limited.)</td>
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<td>Evaluation of thermophysical properties, heat transfer characteristics and cycle performance for HFO1123 mixtures</td>
<td>Yukihiro Higashi (International Institute for Carbon-Neutral Energy Research, Kyushu University)</td>
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<td>Opteon™ Low GWP Refrigerant Solutions - Market Adoption &amp; Looking Ahead to the Future</td>
<td>Joshua Hughes, Barbara H Minor (The Chemours Company)</td>
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<td>Next Generation Low-GWP Refrigerants &quot;AMOLEA™&quot;</td>
<td>Masato Fukushima (AGC Inc.)</td>
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|              | The progress of retrofit to R22 equipment using lower GWP refrigerant | Hitomi Arimoto*, Shun Ohashi*, Yozo Komatsu*, Ivan Rydkin**, Pega Hrnjak*** (Daikin Industries, Ltd.*, DAIKIN AMERICA, INC.**, Creative Thermal Solutions Inc.***)
|              | Development of low-GWP refrigerants for low temperature applications | Robert E Low (Mexichem UK Ltd.)                                                             |
|              | Reduced GWP Refrigerants for Residential and Commercial Air Conditioning System | Samuel Yana Motta, Ankit Sethi (Honeywell International)                                     |
| 17:00 ~ 17:10 | Closing Remarks                                  |                                                                                               |
High-speed refrigerant recovery system Refrigerant recovery takes the longest time at site, our system can reduce time by up to 50% with low cost
Shintaro Ogawa (ASADA CORPORATION)

REFRIGERANTS R454B, R452B and R32
Latest motor technology combined with economiser function ensure peak efficiency despite demanding conditions
- Ricardo Rodriguez*, Matthias Hammerschmidt*, Ferdinand Spannan** (BITZER Kühlmaschinenbau GmbH*, Bitzer Japan K.K.**)

Proposal of newly developed car A/C tools with high recovery ratio for R1234yf and R134a.
- Issei Higami, Kenji Yamasaki (DENGEN CO., LTD.)

NEDO Development project for refrigerants with Low-GWP in refrigerating and air-conditioning systems
- Masazumi Godo, Naoki Ichikawa, Mika Suzawa, Masamichi Abe (New Energy and Industrial Technology Development Organization : NEDO)

Experimental Thermophysical Property Evaluation for Low-GWP and natural refrigerants
- Yohei Kayukawa, Yuya Kano, Yoshitaka Fujita (National Institute of Advanced Industrial Science and Technology : AIST)

Condensation heat transfer of HFO1123 / HFC32 mixture in a multiport tube
- Daisuke Jige, Shogo Kikuchi, Norihiro Inoue (Tokyo University of Marine Science and Technology)

Trend of measurement of HFOs and HCFOs refrigerant transport properties
- Akio Miyara, Keishi Kariya, Md Jahangir Alam, Kotaro Yamaguchi (Saga University)

Ararm for R32 Accorded with a guideline JRA GL-20:2016
- Fumihiko Mitsui (FUSO CO., Ltd.)

Education of refrigerant leak prevention technology improvement
- Masatomo Sakaguchi, Tsutomu Osawa (Japan Association of Refrigeration and Air-Conditioning Contractors : JARAC)

Stationary R32 refrigerant leak detector Technologies contribute to the prevention of specific inert gas emissions which cause the global warming effect
- Hideki Takeyama, Masayuki Ohnishi (ICHINEN TASCO CO., LTD.)

- Hitoshi Asano, Hideki Murakawa, Katsumi Sugimoto (Kobe University)

Maintenance tool to deal with CO₂ refrigeration cycle Experiment of sealing technology for supercritical fluid
- Shigeru Suwa (Pro-Step Co., Ltd.)

Development of the Large Capacity Semi-hermetic Single Screw Compressor for Ice Storage Chiller
- Hideyuki Goto, Kazuki Mori, Harunori Miyamura, Hideki Matsuura (Daikin Industries, Ltd.)

Effect of Additives to Suppress The Combustion of Oil on Pump-Down Accidents
- Tomohiro Higashi, Chaobin Dang, Eiji Hihara, Yuji Shitara (The University of Tokyo)
Overview of risk assessment for A2L refrigerant  
Satoru Fujimoto (Environmental Planning Committee, JRAIA)

Study on safe use of equipment using A3 refrigerants  
Koji Murozono (Environmental Planning Committee, JRAIA)

Risk Assessment of Mini-split Air Conditioners using A3 Refrigerant  
Tsutomu Imoto (Mini-Split Risk Assessment WG3, JRAIA)

Risk Assessment and Safety Measure of Built-in Refrigerated Display Cabinets using A3 Refrigerant  
Hiroshi Nagai (Built-in refrigerated display cabinet risk assessment WG3, JRAIA)

Performance Simulation of Residential Air Conditioner for High Ambient Temperature Region  
Komei Nakajima (Evaluation of Refrigerant WG, JRAIA)

14th Gustav Lorentzen Conference 2020 in Kyoto  
Niccolo Giannett (Japan Society of Refrigerating and Air Conditioning Engineers : JSRAE)