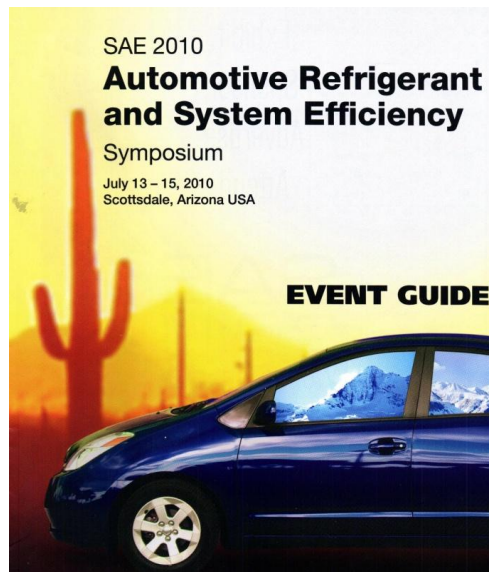


# 2010 SAE Phoenix Refrigerant and System Efficiency Symposium Summary

July 13-15, 2010

Ward Atkinson William Hill Organizers



The SAE Automotive Refrigerant and System Efficiency Symposium held July 13-15, 2010 in Scottsdale Arizona hosted 173 world industry representatives. The attendees came from, 85 companies, 4 universities and 4 governmental agencies. Included were representatives from 22-passenger car, truck and off road vehicle manufactures, 15 air-conditioning system manufacturers, 12 chemical companies, and 44 industry suppliers, associations and testing and engineering companies.

As had been included in prior meetings, MAC ride evaluation vehicles were requested from the vehicle manufacturers, including vehicles having new technologies and production hybrid systems. No vehicles were supplied for evaluation so the afternoon session included an Interior Climate Control Standards Committee meeting and a Workshop on MAC Indirect Emissions.

This overview covers a listing of the technical presentations made during the symposium.

The SAE Web site has all the presentations made during the meeting. Each presentation below is identified by a file name indicating time and the presenter.

Tuesday 13 July

**International Regulatory Issues**

8:00 a.m.

8:00 a.m.

**Introductory Comments**

Ward J. Atkinson, Sun Test Engineering

File PDF T1

8:10 a.m.

**EU Regulation Overview**

Klaus Steininger, European Commission

File PDF T2

8:30 a.m.

**EPA Ann Arbor Indirect Energy Consumption Developments**

Brian J. Nelson, U.S. Environmental Protection Agency

File PDF T3

8:50 a.m.

**Update on California's Regulatory Efforts to Reduce Greenhouse Gas Emissions from Mobile Air Conditioning**

Tao Zhan, California Air Resources Board

File PDF T2

9:10 a.m.

**Panel Discussion and Q&A for all three Regulators**

9:30 a.m.

**BREAK**

10:00 a.m.

**OEM Evaluation of MAC Fuel Consumption by Physical Testing. Comparison of Test Benches, Engine Types and MAC Technologies**

Bruno Rose, PSA; Enrique Peral, Renault

File PDF T5

10:30 a.m.

**Quantificational Analysis of Automotive AC Fuel Consumption on EPA Drive Cycles**

Kelvin Zhai

File PDF T6

11:00 a.m.

**HFO-1234yf – Safety When Exposed to Ignition Sources**

Kai Holtappels, Volkmar Schröder, BAM; Gabriele Hoffmann, Wolfgang Plehn, UBA

File PDF T7

11:30 a.m.

**Review of SAE CRP1234 Results**

William Hill

File PDF T8

**2010 SAE Phoenix Refrigerant and System Efficiency Symposium Summary**

Wednesday 14 July

**MAC Systems**

8:00 a.m.

8:00 a.m.

**R-1234yf Validation and A/C System Energy Efficiency Improvements**

Christophe Petitjean, Valeo; Jugurtha Benouali, Valeo Climate Control Inc.

File PDF W1

8:30 a.m.

**Air-Conditioning System for Electric Vehicle (i-MiEV)**

Hideto Noyama, Mitsubishi Heavy Industries, Ltd.; Kohei Umezu, Mitsubishi Motors Corporation

File PDF W2

9:00 a.m.

**TIFFE – Thermal Systems Integration for Fuel Economy**

Daniela Magnetto, Carlo-Andrea Malvicino, CRF Veicoli

File PDF W3

10:00 a.m.

**Investigations of Efficiency Losses Due to Control of Variable Displacement Compressors**

Jürgen Köhler, TU Braunschweig; Norbert Stulgies; Wilhelm J. Tegethoff, Konvekta AG; Axel Müller, Thomas Magnete GmbH; Sven Foersterling, TLK-Thermo GmbH

File PDF W4

10:30 a.m.

**Management of In-Cabin Compartment Comfort and MAC Fuel Consumption; a Real Application on Alfa Romeo Giulietta**

Andrea Bobbo, Fiat

File PDF W5

11:00 a.m.

**Integrated Air Conditioning Evaporator with Phase Change Material for Thermal Storage**

Timothy Craig, Delphi Thermal Systems; Edward Wolfe, Delphi Corp.

File PDF W6

11:30 a.m.

**Countdown to R1234yf, Industry Preparation**

Christopher Seeton, Honeywell Int'l Inc.

File PDF W7

Thursday 15 July

**MAC Components**

8:00 a.m.

8:00 a.m.

**Novel Heat Exchanger Design Using Approximation Assisted Optimization**

**Yunho Hwang**, Univ. of Maryland; **Omar Abdelaziz**, ORNL; **Vikrant Aute**, University of Maryland School of Engineering; **Reinhard Radermacher**, Univ. of Maryland

File PDF H1

8:30 a.m.

**Development of an Electronic Expansion Valve**

**Ed Stanke**, General Motors

File PDF H2

9:00 a.m.

**Internal Heat Exchanger**

**Pavel Cebe**, Visteon Autopal SRO

File PDF H3

10:00 a.m.

**Analysis of Refrigerant Emissions from Air Conditioning Joints with Slimline Seal Washers**

**Marco A. Enriquez**, GM de Mexico SA de CV

File PDF H4

10:30 a.m.

**Complex Interactions of Low GWP Refrigerants, A/C Oils, and Materials in MAC Circuits**

**Ulrich Grimm**, ILK Dresden

File PDF H5

11:00 a.m.

**Zero Leak Fitting Design**

**Fred Schroeder**, VISTEON

File PDF H6

11:30 a.m.

**Results of Shrieve Evaluations of 1234YF Mobile A/C Lubricants**

**Liz Dixon**, Shrieve Products International Ltd

File PDF H7