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ARTI Preliminary Compatibility Results of Materials Exposed to Refrigerants and Lubricants

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Air-Conditioning and Refrigeration Technology Institute

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The Materials Compatibility and Lubricants Research (MCLR) program is a major research effort investigating the properties and compatibilities of alternative refrigerants. The purpose of the program is to accelerate the commercialization of CFC and HCFC substitutes in air-conditioning and refrigeration applications. The MCLR program is funded largely by the U.S. Department of Energy. It also receives substantial industry support through direct cost sharing and in-kind contributions from the Air-Conditioning and Refrigeration Institute (ARI) and its member companies. The program is managed by the Air-Conditioning and Refrigeration Technology Institute (ARTI) which is an independent not-for-profit corporation established specifically for this program.

Phase I of the MCLR program began on 30 September 1991. For this phase, ARTI issued seven research contracts totaling over 1.2 million dollars. These projects are currently investigating basic properties and materials compatibility of R-32, R-123, R-124, R-125, R-134a, R142b, R-143a, R-152a, and E-134. These refrigerants are being examined as pure refrigerants and also as refrigerant-lubricant mixtures, using seven different lubricants. The projects include:

Project	Researcher
Thermodynamic and Heat Transport Properties	National Institute of Standards and Technology
Chemical and Thermal Stability	Dr. Dietrich Huttenlocher, Spauschus Associates, Inc.
Miscibility of Refrigerants and Lubricants	Dr. Michael Pate, Iowa State University
Compatibility with Motor Materials	Dr. Robert Doerr, The Trane Company
Compatibility with Engineering Plastics	Dr. Richard Cavestri, Imagination Resources
Compatibility with Elastomers	Dr. Robert Seiple, University of Akron
Refrigerant Database	Mr. James Calm, Consultant

The refrigerant database provides a technical abstract and bibliographic information on the MCLR technical reports and other related research. Five of the seven Phase I researchers will present preliminary results of their research at the 1992 International Refrigeration Conference. Updated results of Phase I projects will be presented at the 1993 ASHRAE Winter Meeting in Chicago.

Phase II of the MCLR program started this summer with additional research contracts to measure solubility and viscosity of the various refrigerant-lubricant mixtures, their compatibility with desiccants, and the development of several accelerated screening and test methods. Results of these projects will be presented in future conferences and symposia.

The U.S. Department of Energy and the air-conditioning industry support for the Materials Compatibility and Lubricants Research (MCLR) program does not constitute an endorsement by the U.S. Department of Energy, nor by the air-conditioning and refrigeration industry, of the views expressed herein.