

**Paper Number:** ICR320

**Title of Paper:** Experimental Characterization of a Scroll and a Piston Compressor Working With R22 and Propane (R290) as Refrigerant

**Presenter:** J. F. Urchueguia, J. M. Corberan, J. Gonzalez, Universidad Politecnica de Valencia, Spain; J. M. Diaz, Consejo Superior de Investigaciones Cientificas, Spain

**Session:** B2-15

**Person Contributing Discussion or Question:** (Sonny) G. Sundaresan, Copeland Corp., 1675 W. Campbell RD., Sidney, OH

**Comment or Question:** (1) Were both compressors rated for R22? (2) Was the same oil recommended with propane by compressor manufacturer? (3) What would you do differently?

**Presenter's Reply:** (1) Yes, they were rated for R22. (2) Oil (mineral) was supplied by the manufacturer for R22 use. We didn't ask whether it was also suitable for R290. (3) In order to optimize the compressor's operation (which we did not) different oils should be tried.

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**Paper Number:** ICR0320

**Title of Paper:** Experimental Charaterization of a Scroll and a Piston Compressor Working With R22 and Propane (R290) as Refrigerant

**Presenter:** J. F. Urchueguia, J. M. Corberan, J. Gonzalez, Universidad Politecnica de Valencia, Spain; J. M. Diaz, Consejo Superior de Investigaciones Cientificas, Spain

**Session:** B2-15

**Person Contributing Discussion or Question:** Perevozchikov, M., Copeland, Corp., 1675 West Campbell Rd., P.O. Box 669, Sidney, OH 45365

**Comment or Question:** For what conditions scroll and reciprocating compressors were designed – optimized?

**Presenter's Reply:** Both compressors were off-the-shelf, therefore they were optimized by the manufacturer for the desired application: a heat pump working on R22 compression cycle.

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**Title of Paper:** Experimental Characterization of a Scroll and a Piston Compressor Working With R22 and Propane (R290) as Refrigerant

**Presenter:** J. F. Urchueguia, J. M. Corberan, J. Gonzalvez, Universidad Politecnica de Valencia, Spain; J. M. Diaz, Consejo Superior de Investigaciones Cientificas, Spain

**Session:** B2-15

**Person Contributing Discussion or Question:** Jeong, S. (KAIST), 373-1 Yusung-Ku Kusung-Dong (ME3039) Taejon, KOREA (S)

**Comment or Question:** Using propane reduces temperature rise in compressor. Since the motor generates heat inside the compressor, the temperature also rises due to electrical reason. How much temperature rise comes from thermodynamic reason and how much from electrical reason (or source)?

**Presenter's Reply:** Your comment is right. However, we have not addressed this issue, and I don't think we could give an answer derived from actual tests.

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**Paper Number:** ICR0320

**Title of Paper:** Experimental Characterization of a Scroll and a Piston Compressor Working With R22 and Propane (R290) as Refrigerant

**Presenter:** J. F. Urchueguia, J. M. Corberan, J. Gonzalvez, Universidad Politecnica de Valencia, Spain; J. M. Diaz, Consejo Superior de Investigaciones Cientificas, Spain

**Session:** B2-15

**Person Contributing Discussion or Question:** Fernando, W.P.D, Royal Institute of Technology (KTH), Dept. of Energy Technology 10044, Stockholm, Sweden

**Comment or Question:** The variations in compressor with propane; is could be due to very high solubility of propane with compressor lubrication oils. Specially propane is highly soluble with lubrication oils at high evaporation temperatures (low pressure ratios).

**Presenter's Reply:** Your comment is correct. However, our scope of work did not include the change of lubricating oil. Further test must be performed to assess the influence of oil.

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**Paper Number:** ICR0025

**Title of Paper:** Selection of Screw Compressors for Energy Efficient Operation

**Presenter:** D. T. Reindl and T. B. Jekel, University of Wisconsin-Madison, USA

**Session:** B2-15

**Person Contributing Discussion or Question:** Li Harry, McQuay International, Staunton, VA 24402

**Comment or Question:** Have you considered the part load in this study?

**Presenter's Reply:** The analysis considered here are only for full-load operation. We did not have reliable fixed and variable volume ratio part-load data that would have allowed us to extend our analysis. From an energy standpoint we can tell you to operate screw compressors as fully loaded as possible.

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**Paper Number:** ICR0025

**Title of Paper:** Selection of Screw Compressors for Energy Efficient Operation

**Presenter:** D. T. Reindl and T. B. Jekel, University of Wisconsin-Madison, USA

**Session:** B2-15

**Person Contributing Discussion or Question:** Keith Sharp, 1 Morganite Dr.,  
Dunn, NC

**Comment or Question:** Versus a fixed Vi compressor, what would the energy savings of a variable Vi compressor for the temperature profile show in your presentation?

**Presenter's Reply:** Although we did not calculate for the example frequency distribution shown, the significant number of hours at low condensing temperatures would minimize the energy benefit for variable Vi. We would estimate a benefit of less than 5%.

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**Paper Number:** ICR0025

**Title of Paper:** Selection of Screw Compressors for Energy Efficient Operation

**Presenter:** D. T. Reindl and T. B. Jekel, University of Wisconsin-Madison, USA

**Session:** B2-15

**Person Contributing Discussion or Question:** (Sonny) G. Sundaresan, Copeland Corp., 1675 W. Campbell RD., Sidney, OH

**Comment or Question:** With respect to retrofit or new refrigerant, what are the considerations (capacity or efficiency related)?

**Presenter's Reply:** Our focus in this paper was on custom-engineered field-erected systems. As such, they are rarely retrofitted with alternative refrigerants. Must utilize anhydrous ammonia which is not subject to phase-out because it has no ozone depletion and no global warming potential.

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**Paper Number:** ICR0607

**Title of Paper:** Performance Evaluation and Development of Empirical Model for Hermetically Sealed Reciprocating Compressor

**Presenter:** R. S. Agarwal and S. Paramane, Indian Institute of Technology Delhi, India

**Session:** B2-15

**Person Contributing Discussion or Question:** Martien Janssen, Re/gent BV.  
Lagednk 22, 5705 BZ Helmond, The Netherlands

**Comment or Question:** How did you determine the heat loss factor of the expansion valve?

**Presenter's Reply:** The heat loss factor (oa. value) was supplied by the compressor calorimeter manufacturer. We have not determined.

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**Paper Number:** ICR607

**Title of Paper:** Performance Evaluation and Development of Empirical Model for Hermetically Sealed Reciprocating Compressor

**Presenter:** R. S. Agarwal and S. Paramane, Indian Institute of Technology Delhi, India

**Session:** B2-15

**Person Contributing Discussion or Question:** (Sonny) G. Sundaresan, Copeland Corp., 1675 W. Campbell RD., Sidney, OH

**Comment or Question:** Did you measure the actual compressor speed?

**Presenter's Reply:** During the calorimetric test the speed of the compressor was not measured.

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**Paper Number:** ICR0602

**Title of Paper:** Cold Flow Evaluation of Lube Oils Through Nonwoven Filter Materials

**Presenter:** K.-J. Choi, AAF International, USA

**Session:** B2-15

**Person Contributing Discussion or Question:** (Sonny) G. Sundaresan, Copeland Corp., 1675 W. Campbell RD., Sidney, OH

**Comment or Question:** What are the differences between polymer additive 1 and 2? Why were they two chosen?

**Presenter's Reply:** One from Exxon. The other from R&H. It is viscosity enhancement organ polymers.