CONTENTS

ost Chapter: Baltimore	
rogram Committee and Transactions Staff	
ate of the Society by Donald G. Rich, 1991-92 President	ix
eynote Address	xiii
chnical Program Abstracts	kvii

TECHNICAL PAPERS

3597	A Methodology for the Evaluation of Cooling Tower Fan System Performance as Influenced by Drift Eliminator
	Design by B.R. Becker and L.F. Burdick
3598	Experimental Performance of an Indirect Evaporative Cooler (RP-563) by J.L. Peterson and B.D. Hunn
3599	Efficacy of Biocides in Controlling Microbial Populations, Including Legionella, in Cooling Systems (RP-586) by
	D.H. Pope and D.M. Dziewulski
3600	Efficiency of Odd-Tube-Pass Heat Exchangers by N.Y. Vaidya, N.M. Subramanian, V. Subramanian, and V.D. Rane
3601	Nucleate Boiling Heat Transfer of Lithium Bromide/Water Solution on a Low Finned Tube by M. Hou and S. Tan
3602	Prediction of the Heat Transfer Characteristics of R-22/R-152a/R-114 and R-22/R-152a/R-124 by S.M. Sami, J.
	Schnotale, and J.G. Smale
3603	Flow of R-22 through Short Tube Restrictors by S.J. Kuehl and V.W. Goldschmidt
3604	Measurement and Correlations of Frost Properties with Airflow Over a Flat Plate by Y. Mao, R.W. Besant, and K.S.
	Rezkallah
3605	Dynamic Response Factor Estimation: A Point Algebraic Method by A.D. Irving
3606	An Experimental Study of Tube-Side Fouling Resistance in Water-Chiller-Flooded Evaporators (RP-560) by S.I.
	Haider, R.L. Webb, and A.K. Meitz
3607	The Impact of Comfort Control on Air Conditioner Energy Use in Humid Climates by H.I. Henderson, Jr.,
	K. Rengaraian, and D.B. Shirey, III
3608	Decentralized Control Systems for HVAC by M. Zaheer-uddin
3609	Particulars of Air Conditioning in Hot Climates by M.A. Abdelrahman
3610	Research and Development of a Home Use VAV Air-Conditioning System by T. Okada, T. Yoshikawa, Y. Seshimo,
	and H. Igarashi
3611	Transfer Efficiency Measures for the Study of Indoor Air Quality by B.A. Rock, M.J. Brandemuehl, and R.
0011	Anderson
3612	Life-Cycle Cost Analysis Applied to Selection of Compression Equipment for Industrial Refrigeration Systems by
00.2	S.B. Neumann and D.L. Fenton
3613	Market Potential Estimates and R&D Planning for Advanced Absorption Systems for Large Commercial Buildings
	by J.M. MacDonald, P.J. Hughes, and H.A. McLain
3614	A Performance Model of an Instantaneous, Condensing, Gas-Fired Hot Water Boiler by S.A. Idem, A.M. Jacobi,
	G.M. Maxwell, and V.W. Goldschmidt
3615	Modeling and Simulation of a Superheat-Controlled Water-to-Water Heat Pump by N.B.M. Stefanuk, J.D. Aplevich,
00.0	and M. Renksizbulut
3616	Coefficient of Performance of an Ideal Absorption Cycle by J. Wang, X. Hu, and C. Liu
3617	An Analytical Screening of Alternatives for R-502 in Low-Temperature Refrigerating Applications by S.K. Fischer
3618	Chemical Analysis Protocol for Alternative RefrigerantsPart 1: Spectroscopic Methods by T.J. Bruno
3619	Chemical Analysis Protocol for Alternative Refrigerants—Part 2: Separation Methods by T.J. Bruno
3620	Testing of Domestic Two-Evaporator Refrigerators with Zeotropic Refrigerant Mixtures by R.J. Rose, D. Jung, and
0020	R. Radermacher
3621	Absorption of HCFC-123 and CFC-11 by Epoxy Motor Varnish by R.G. Doerr

v

SYMPOSIUM PAPERS

BA-92-1	Air Quality and Quantity in Laboratory Animal Facilities Animal Facility Ventilation Air Quality and Quantity by E.L. Besch	239
	A Survey of Laboratory Rat Environments by Y. Zhang, L.L. Christianson, G.L. Riskowski, B. Zhang, G. Taylor, H.W. Gonyou, and P.C. Harrison	247
	Conversion of a Single Floor in a High-Rise Office Building into an Animal Research Facility by RT. Ellis	254
	Air Quality Evaluations of Animal Room Facilities Utilized for the Production of Laboratory Mice by W.A. Turner, FT. McKnight, R.B. Jones, J.M. Barth, B.J. Paigen, J.L. Ohman, and M.R. MacDonald Evaluation of Ventilation Rates through Four Types of Rat Cages by Y. Zhang, L.L. Christianson, and G.L.	262
	Riskowski	272
BA-92-2	Airflow in Realistic Rooms—CFD and Physical Data Correlation of Residual Velocity with Throw and Terminal Velocity from a Louver-Faced Unidirectional Diffuser by H.H. Yousoufian	285
	Isothermal Airflow Characteristics in a Ventilated Room with a Slot Inlet Opening by Y. Jin and J.R. Ogilvie Full-Scale Experimental Results on the Mean and Turbulent Behavior of Room Ventilation Flows by J.S. Zhang,	296
	G.J. Wu, and L.L. Christianson Simulation of Airflow through Large Openings in Buildings by A. Schaelin, J. van der Maas, and A. Moser	307 319
	Development of Three-Dimensional Thermal Airflow Analysis Computer Program and Verification Test by T. Mizuno and M.J. Warfield	329
BA-92-3	Measured Energy Performance of HVAC Components in Commercial Buildings	
	Monitored Air Handler Performance and Comparison with a Simplified System Model by S. Katipamula and D.E. Claridge	341
	Energy Performance of Heat Pumps in New Commercial Buildings in the Pacific Northwest by M.A. Piette, O. de Buen, and B. Nordman	352
	Analysis of the Dynamic Energy Performance of an HVAC System by Combining Simulations and Measurements by I. Ljungkrona, E. Abel, and E. Isfält	363
	Measured Energy Consumption of Variable-Air-Volume Fans under Inlet Vane and Variable-Speed-Drive Control by D.M. Lorenzetti and L.K. Norford	371
BA-92-4	Recent Advances in Enhanced Heat and Mass Transfer—Part I	
	Heat Transfer Enhancement Using Tangential Injection by V.K. Dhir and F. Chang Air-Side Performance of Enhanced Brazed Aluminum Heat Exhangers by R.L. Webb and S-H. Jung Flow Boiling Enhancement of R-22 and a Nonazeotropic Mixture of R-143a and R-124 Using Perforated Foils by	383 391
	J.C. Conklin and E.A. Vineyard	402
	Convective Vaporization of Refrigerants in Tube Banks by N.S. Gupte and R.L. Webb	411
BA-92-5	Recent Advances in Enhanced Heat and Mass Transfer—Part II	
	EHD Enhancement of Shell-Side Boiling Heat Transfer Coefficients of R-123/Oil Mixture by M.M. Ohadi, R.A. Papar, T.L. Ng, M.A. Faani, and R. Radermacher	427
	Boiling Heat Transfer Enhancement in Tube-Bundle Evaporators Utilizing Electric Field Effects by J. Ogata, Y. Iwafuji, Y. Shimada, and T. Yamazaki	435
	Practical Design Aspects of EHD Heat Transfer Enhancement in Evaporators by P. Cooper	445
	Experimental Study of Electrohydrodynamically (EHD) Enhanced Evaporator for Nonazeotropic Mixtures by A Yabe, T. Taketani, H. Maki, K. Takahashi, and Y. Nakadai	455
	EHD Boiling Enhancement in Shell-and-Tube Evaporators and Its Application in Refrigeration Plants by C. Damianidis, T.G. Karayiannis, R.K. Al-Dadah, R.W. James, M.W. Collins, and P.H.G. Allen	462
BA-92-6	Measurement of Moisture Properties in Building Materials Water Vapor Sorption Measurements of Common Building Materials by R.F. Richards, D.M. Burch, and W.C. Thomas	475
	Water Vapor Permeability Measurements of Common Building Materials by D.M. Burch, W.C. Thomas, and A.H. Fanney	486
	Measurement of the Heat of Adsorption for a Typical Fibrous Insulation by Y-X. Tao, R.W. Besant, and C.J. Simonson	495
	Apparatus for Studying Transient Heat and Moisture Transfer in Fiberglass Batt Insulation by R J. Couvillion, J.S. Hawisa, and G.J. Tatge	502

BA-92-7	The Measurement of Moisture and Humidity A New Moisture Permeability Measurement Method and Representative Test Data by J.S. Douglas, T.H. Kuehn, and J.W. Ramsey Optical Noncontact Hygrometer Technology by L.D. Nelson and A.M. Kahan Humidity Sensors in Heating, Ventilating, and Air-Conditioning (HVAC) Systems by R.M. Thomas	513 520 529
BA-92-8	Control System Commissioning Commissioning Building Mechanical Systems by K.M. Elovitz	543
	Specification of Spreadsheet Trend Log Sets for DDC/EMCS and HVAC Systems Commissioning, Energy Monitoring, Life Safety Cycles, and Performance-Based Service Contracts by D.P.W. Solberg and M.D. Teeters DCS Commissioning for a Microelectronics Factory by P.J. Naughton	553 561
	Commissioning by Committee by E.E. Friberg, M.A. Smith, and FJ. Reid	572
BA-92-9	Ground-Source Heating and Cooling Systems Large Tonnage Groundwater Heat Pumps—Experiences with Two Systems by K.D. Rafferty An Energy-Efficient HVAC System at a High School by R.B. Stotz and R.L. Hanson Using Existing Standards to Compare Energy Consumption of Ground-Source Heat Pumps with Conventional	587 593
	Equipment by S.P. Kavanaugh Field Test of a Vertical Ground-Coupled Heat Pump in Alabama by S.P. Kavanaugh	599 607
BA-92-10	Thermal Resistance of Fenestration Systems and Test Procedures and Uncertainty Analysis Method of Measuring Nighttime U-Values Using the Mobile Window Thermal Test Facility by J.H. Klems Heat Transmission and R-Value of Fenestration Systems Using IRC Hot Box: Procedure and Uncertainty Analysis	619
	by A.H. Elmahdy Uncertainties in the Evaluation of Window SHGC and U-Values Measured Using an Indoor Solar Simulator Facil-	630
	ity by S.J. Harrison and F.M. Dubrous	638
BA-92-11	New Horizons in Refrigeration Load Calculations Latent Heat, Equipment-Related Load, and Applied Psychrometrics at Freezer Temperatures by G.R. Smith Calculating Refrigeration Loads on an Hour-by-Hour Basis: Part I—Building Envelope by R.N. Ballard Calculating Refrigeration Loads on an Hour-by-Hour Basis. Part II—Infiltration and Internal Heat Sources by	649 658
	R.N. Ballard	664

SOCIETY BUSINESS

1991-92 ASHRAE Officers, Directors, Committee Members, and Staff	673
ASHRAE Chapter Officers	677
ASHRAE Technical Committees and Task Groups	679
ASHRAE Standards Project Committees	693
ASHRAE Past Meetings	699
Society Presidents	700
ASHRAE Honors and Awards	701
ASHRAE Intersociety Representatives	710
SHRAE International Associates	711
In Memoriam	712
Index of Technical and Symposium Papers, Volume 98, Part 2	715