CONTENTS

Host C Progra	Chapter: Anaheim Im Committee and Transactions Staff If the Society by Donald G. Rich, ASHRAE 1991-92 President	X X yi
Technic	cal Program Abstracts	XV
	TECHNICAL PAPERS	
3543	Saving Fan Energy in VAV Systems—Part 1: Analysis of a Variable-Speed-Drive Retrofit by S.L. Englander and L.K. Norford	3
3544	Saving Fan Energy in VAV Systems—Part 2: Supply Fan Control for Static Pressure Minimization Using DDC Zone Feedback by S.L. Englander and L.K. Norford	. 19
3545	Indoor Airflow with Cooling Panel and Radiative/Convective Heat Source by Z. Jiang, Q. Chen, and A. Moser	33
3546	Parametric Analysis of a Building Space Conditioned by a VAV System by Z. Zhang and R.M. Nelson	43
3547	A New Development in Air Conditioning by M. Stahl and G.M. Keller	49
3548	Detailed Measurements of Room Air Distribution for Evaluating Numerical Simulation Models by J.S. Zhang, L.L. Christianson, G.J. Wu, and G.L. Riskowski	58
3549	Assessment of Stair Pressurization Systems for Smoke Control (RP-559) by G.T. Tamura	66
3550	Using the Sequential Box Model to Predict Transient Solvent Concentrations Arising from Applying a Surface Coating Inside a Confined Space by B.A. Bruno and R.J. Heinsohn	73
3551	Diffusion Characteristics of Airborne Particles with Gravitational Settling in a Convection-Dominant Indoor Flow Field by S. Murakami, S. Kato, S. Nagano, and Y. Tanaka	82
3552	A Computerized Data Acquisition and Reduction System for Velocity Traverses in a Ventilation Laboratory by S.E. Guffey	98
3553	Investigating the Causes of Water Hammer in a Water Control Valve by M. Wapler and J.T. Pearson	107
3554	Flow Characteristics in Rectangular Ducts (RP-549) by E.I. Griggs and F. Khodabakhsh-Sharifabad	116
3555	Chemical Analysis and Recycling of Used Refrigerant from Field Systems (RP-601) by R.E. Kauffman	128
3556	Properties of Lithium Bromide-Water Solutions at High Temperatures and Concentrations—Part III: Specific Heat (RP-527) by S.M. Jeter, J.P. Moran, and A.S. Teja	137
3557	Investigation of R-22/R-142b Mixture as a Substitute for R-12 in Single-Evaporator Domestic Refrigerators by X. He, U.C. Spindler, D.S. Jung, and R. Radermacher	150
3558	Effect of Condenser Liquid Subcooling on System Performance for Refrigerants CFC-12, HFC-134a, and HFC-152a by J.W. Linton, W.K. Snelson, and P.F. Hearty	160
3559	Properties of Lithium Bromide-Water Solutions at High Temperatures and Concentrations—Part IV: Vapor Pressure (RP-527) by J.L.Y. Lenard, S.M. Jeter, and A.S. Teja	167
3560	Air-Cleaning Strategies for Equivalent Indoor Air Quality by H.H.S. Yu and R.R. Raber	
3561	Estimating Thermal Transient Comfort by X.L. Wang and F.K. Peterson	182
3562	Transient Interaction between the Human and the Thermal Environment by B.W. Jones and Y. Ogawa	189
3563	Laboratory Tests of the Nonlinearity of Outdoor Air Percentage as a Function of Damper Position and Induced Inlet Pressure by P. Curtiss and J.F. Kreider	196
3564	A Numerical Study of Indoor Air Quality and Thermal Comfort Under Six Kinds of Air Diffusion by Q. Chen, A. Moser, and P. Suter	203
3565	Numerical Study on Diffusion in a Room with a Locally Balanced Supply-Exhaust Airflow Rate System by S. Kato, S. Murakami, and S. Nagano	218
3566	Increasing the Ventilation Effectiveness of Multizone Air-Handling Units through Improved Outside Air Duct Design by P. Rojeski, Jr., and H. Singh	239
3567	Distribution and Ventilation Efficiency of CO ₂ Produced by Occupants in Upward and Downward Ventilated Rooms by I.G. Kim and H. Homma	242
3568	Simulated Savings Due to Switching Off Fluorescent Lamps, Including Energy and Replacement Costs by J.P. Higgins, Jr., and J.A. Tichy	251
3569	A Study of the Effects of Solar Radiation on the Indoor Environment by A.K. Athienitis and F. Haghighat	257
3570	Winter Steady-State Relative Humidity and Moisture Load Prediction in Dwellings by K.R. Stum	262
3571	Maximum Glazing Area of New Office Buildings in Montréal by R. Zmeureanu, P. Fazio, and A. Doramajian	273
3572	Determination of Transient Heat Conduction through Building Envelopes—A Review by F. Haghighat and H. Liang	284
3573	Dynamic Evaluation of Thermal Bridges in a Typical Office Building by D.M. Burch, J.E. Seem, G.N. Walton, and B.A. Licitra	291

3574	A Multiclimate Comparison of the Improved TC 4.7 Simplified Energy Analysis Procedure with DOE-2 (RP-564) by R. Balasubramanya, D.E. Claridge, L.K. Norford, and J.F. Kreider
3575	A Thermal Mass Treatment for the TC 4.7 Simplified Energy Analysis Procedure (RP-564) by D.E. Claridge,
	L.K. Norford, and R. Balasubramanya
3576	Modeling of Weather Data by Time Series Analysis for Air-Conditioning Load Calculations by H. Yoshida and T. Terai
3577	Degree-Day Base Temperature for Residential Building Energy Prediction in Saudi Arabia by S.A.M. Said
3578	Dynamic Global-to-Direct Irradiance Conversion Models (RP-644) by R.R. Perez, P. Ineichen, E.L. Maxwell, R.D. Seals, and A. Zelenka
3579	Simulating Combined Thermostat, Air Conditioner, and Building Performance in a House by H.I. Henderson, Jr
3580	Commercial Building Temperature Recovery—Part I: Design Procedure Based on a Step Response Model
	(RP-491) by P.R. Armstrong, C.E. Hancock, and J.E. Seem
3581	Commercial Building Temperature Recovery—Part II: Experiments to Verify the Step Response Model
	(RP-491) by P.R. Armstrong, C.E. Hancock, and J.E. Seem
3582	Prediction of Performance and Stability of Heat Pump Systems with Long Pipes and High Head by T. Hirao,
0500	S. Ohzeki, T. Imaiida, and S. Kobayashi
3583	Conception, Simulation, Dimensioning, and Testing of an Experimental Chemical Heat Pump by M. Lebrun and P. Neveu
3584	Benchmark Performance Analysis of an ECM-Modulated Air-to-Air Heat Pump with a Reciprocating Compres-
	sor by C.K. Rice
3585	A Model of Hot-Gas Defrosting of Evaporators—Part 1: Heat and Mass Transfer Theory by K.I. Krakow, L. Yan,
3586	and S. Lin
,500	S. Lin
3587	Three-Zone, Steady-State Modeling of a Mobile Air-Conditioning Condenser by M.J. Kempiak and R.R.
	Crawford
3588	Performance of a Residential Desuperheater by A.H. Fanney and B.P. Dougherty
3589	Literature Survey on Recommended Procedures for the Selection, Placement, and Type of Evaporators for
	Refrigerated Warehouses (RP-569) by R.R. Crawford, J.P. Mavec, and R.A. Cole
3590	Analytical and Numerical Results for the Deicing of Ice-Maker Evaporators by S.M. Aceves-Saborio and G.M. Reistad
3591	Development of a Generalized Model for Performance Evaluation of Packed-Type Liquid Sorbent Dehumidifiers
	and Regenerators (RP-298) by A.Y. Khan and H.D. Ball
3592	Development of a Mathematical Model and Computer Simulation to Predict the Annual Energy Consumption
	of Coil-Type Liquid Desiccant Systems (RP-298) by A.Y. Khan and H.D. Ball
3593	Heat Transfer and Hydrodynamic Analysis of an Energy Collection System in a Solar Rankine Engine by
2504	A.F.M. Abdul Ali, M.O. Nazer, and A.A. Rahman
3594	The Effect of Temperature-Dependent Properties on the Performance of Run-Around Heat Recovery Systems
2505	Using Aqueous-Glycol Coupling Fluids by Y.Y. Zeng, R.W. Besant, and K.S. Rezkallah
3595	The Performance of a Run-Around System Using a Two-Phase, Gas-Liquid Coupling Fluid by Y.Y. Zeng, R.W. Besant, and K.S. Rezkallah
3596	Numerical Prediction of Moisture Condensation on Curtain Walls Using the Finite-Element Method and Its
0960	Experimental Validation by H. Han, B.M. Khusinsky, and B. Crooks
	Experimental valuation by D. Hall, D.W. Miusinsky, and D. Crooks

SYMPOSIUM PAPERS

AN-92-1	The Relative Importance of Various Geometrical Design Parameters in a Hot, Humid Climate by E. Shaviv and I.G. Capeluto	
	Practical Experience in Achieving High Levels of Accuracy in Energy Simulations of Existing Buildings by J.P. Waltz	606
	Input-Output Sensitivity Analysis of Building Energy Simulations by G.C. Corson Nonresidential Energy Standards Confidence and Sensitivity Analysis by D.E. Mahone, S. Krishnamurti, T. Alereza, and J.A. Johnson	618 627
	A Procedure for Calibrating the DOE-2 Simulation Program to Non-Weather-Dependent Measured Loads by D.J. Bronson, S.B. Hinchey, J.S. Haberl, and D.L. O'Neal	636
AN-92-2	Topics in Service Water Heating Technology and Economics Operating Characteristics and Annual Efficiencies of Combination Space/Water-Heating Systems by S.G. Talbert, J.G. Murray, R.A. Borgeson, V.P. Kam, and J.A. Pietsch	655
	E.R. Kweller Measured Savings from Time- or Demand-Based Temperature Controls on Service Water Heaters in Apartment Buildings by M.S. Lobenstein, D.L. Bohac, T.J. Staller, T.S. Dunsworth, and M.W. Hancock Water-Heating Energy Savings in Commercial Laundries by G.A. Moore and M. Perlman	665 676 690
AN-92-3	Topics in Desiccant Technology Removal of Radon from Indoor Air by Activated Carbon and Solid Desiccants by N.M. Hassan, A.L. Hines,	000
	T.K. Ghosh, S.K. Loyalka, and D. Novosel The Effect of Regenerator Performance on a Liquid-Desiccant Air Conditioner by A.I. Lowenstein and M.H.	699
	Dean The Effect of Absorber Design on the Peformance of a Liquid-Desiccant Air Conditioner by A.I. Lowenstein and R.S. Gabruk	704 712
	and the dublin the second of t	, ,
AN-92-4	Raised Floor Air Distribution—Two Possibility for Increasing Ventilation Efficiency with Upward Ventilation by I.G. Kim and H. Homma Integrated Access Floor HVAC by R.W. Shute The Influence of Supply and Exhaust Openings on Ventilation Efficiency in an Air-Conditioned Room with a Raised Floor by S. Murakami, S. Kato, T. Tanaka, DH. Choi, and T. Kitazawa	723 730 738
	Air Movement, Ventilation, and Comfort in a Partitioned Office Space by F.S. Bauman, D. Faulkner, E.A. Arens, W.J. Fisk, L.P. Johnston, P.J. McNeel, D. Pih, and H. Zhang	756
AN-92-5	Alternative Refrigerants—Materials Compatibility and Lubricants Solubility and Miscibility of Environmentally Safer Refrigerant/Lubricant Mixtures by R.H.P. Thomas and	
	H.T. Pham High-Viscosity Ester Lubricants for Alternative Refrigerants by G.D. Short and R.C. Cavestri Polyalkylene Glycol and Polyolester Lubricant Candidates for Use with HFC-134a in Refrigeration Compres-	783 789
	sors by S.G. Sundaresan and W.R. Finkenstadt Compatibilities of Nonmetallic Materials with R-134a and Alternative Lubricants in Refrigeration Systems by P.D. Guy, G. Tompsett, and T.W. Dekleva	796 804
AN-92-6	Advanced Research in Fenestration Heat Transfer Using Infrared Thermography for the Study of Heat Transfer through Building Envelope Components by	
	D.K. Arasteh, F.A. Beck, B.T. Griffith, N. Byars, and M. Acevedo-Ruiz Determination of Total Window Solar Heat Gain Coefficient by S.C. Carpenter and J.A. Baker A Residential Fenestration Performance Design Tool by R. Sullivan, B. Chin, D. Arasteh, and S. Selkowitz A Simple Method for Computing Window Energy Performance for Different Locations and Orientations by	819 825 832
	F.M. Dubrous and A.G. Wilson	841
AN-92-7	Building Energy Retrofit Performance Monitoring Using Short-Term Monitoring to Improve Virginia's Weatherization Program by K.M. Greely, J. Randolph, and W.W. Hill	853
	Field Inspection of Building Components—A Tool for Cost-Effective Measures in Retrofitting Buildings by M.D. Lyberg and S.Å. Ljungberg	865
	Monitoring Approaches for Energy Conservation Impact Evaluation by D.R. Landsberg and J.A. Amalfi Monitored Commercial Building Energy Data: Reporting the Results by D.E. Claridge, J.S. Haberl, R.J. Sparks, R.E. Lopez, and K. Kissock	874 881

AN-92-8	Impact of Building Dynamics and Control Strategies on Building Operating Costs A Comparison of Chiller-Priority, Storage-Priority, and Optimal Control of an Ice-Storage System by J.E.	
	Braun The Impact of Personal Environmental Control on Building Energy Use by J.E. Seem and J.E. Braun Heat Storage in Building Thermal Mass: A Parametric Study by I. Andresen and M.J. Brandemuehl Operational Strategies for Reducing Coil Loads by T.B. Jekel, J.W. Mitchell, and S.A. Klein	893 903 910 919
AN-92-9	Validation of Numerical Models for Predicting Room Air Motion Significant Questions in Predicting Room Air Motion by Q. Chen and Z. Jiang	929
	by T.H. Kuehn, D.Y.H. Pui, and J.P. Gratzek Numerical Prediction of Horizontal Nonisothermal 3-D Jet in Room Based on Algebraic Second-Moment Closure Model by S. Murakami, S. Kato, and Y. Kondo Description of Supply Openings in Numerical Models for Room Air Distribution by P.V. Nielsen	940 951 963
AN-92-10	New Developments in Engine-Driven Heat Pumps Design Considerations for Gas-Engine Heat Pumps by T. Yokoyama . Development of a 2.5-RT Multiple-Indoor-Unit Gas-Engine Heat Pump by K. Taira The Performance of a Four-Ton Gas-Engine-Driven Heat Pump by T. Kaneko, M. Obitani, and T. Imura Development and Field Testing of a High-Efficiency Engine-Driven Gas Heat Pump for Light Commercial Applications by G.A. Nowakowski, M. Inada, and M.P. Dearing	975 982 989 994
AN-92-11	Case Studies of Direct Cooling Systems Precooling and Direct-Cooling Coils for Groundwater, Lake Water, and Water-Loop Heat Pump Systems by S.P. Kavanaugh Reduced Energy Use Achieved by Direct and Indirect Use of Groundwater by J.O. Goss Aquifer Seasonal Cold Storage for Space Conditioning: Some Cost-Effective Applications by A.L. Snijders Free Cooling Works for Cowlitz County Hall of Justice by B.R. Meloy Groundwater Heat Pumping: Lessons Learned in 43 Years at One Building by M.J. Hatten	1003 1009 1015 1023 1031
AN-92-12	International Symposium on Environmental and Safety Aspects of District Heating and Cooling The Clean Air Act Amendments of 1990 and the National Energy Strategy of 1991 in Relation to District Heating and Cooling by E.O. Kainlauri District Heating Development, Air Quality Improvement, and Cogeneration in Kraków, Poland by H. Manczyk and M.D. Leach District Heating and the Environment—An Integrated Least-Cost, Least Environmental Impact Planning Method by L.E. Åstrand Campus Internal Environmental Considerations for Health Care and Biomedical Research Facilities by R.F. Baker	1041 1047 1057 1062
AN-92-13	Making Existing Monitored Energy Data Sets Available to ASHRAE Members A Guide for Analyzing and Reporting Building Characteristics and Energy Use in Commercial Buildings by R.P. Mazzucchi Comparing Monitoring Protocols for Energy Retrofits by J.S. Haberl, A. Athar, M. Abbas, D.E. Claridge, and J.M. MacDonald Pacific Northwest Nonresidential Energy Survey by T. Alereza, D.R. Dohrmann, and R. Oberg Meeting New Commercial Building Survey Requirements by A. Schon Transformation of Existing Building Energy Characteristics Data Sets into a Consistent Format by D.R. Landsberg	1067 1081 1097 1104
AN-92-14	Integration of Thermal Storage and Fire Protection Systems Case Study of Combined Chilled-Water Thermal Energy Storage and Fire Protection Storage by G.V.R. Holness Retrofit Integration of Fire Protection Storage as Chilled-Water Storage—A Case Study by M.A. Hussain and D.C.J. Peters Integrating an Off-Peak Cooling System with a Fire Suppression System in an Existing High-Rise Office Building by A.L. Slabodkin Design of Integrated Fire Sprinkler Piping and Thermal Storage Systems: Benefits and Challenges by M. Meckler	1119 1123 1133 1140
AN-92-15	Innovative Monitoring Approaches in Buildings Simplified Methods for the Thermal Analysis of Multifamily and Administrative Buildings by B. Lachal, W.U. Weber, and O. Guisan	115 ⁻
	RTP-Based Energy Management Systems: Monitoring, Communication, and Control Requirements for Buildings under Real-Time Pricing by B. Daryanian, L.K. Norford, and R.D. Tabors Metered End-Use Data and Energy Conservation Potentials in a Department Store in Cairo, Egypt by H.	1160
	Akbari, S.E. Greenberg, J.S. Kromer, A. Abd-Rabou, M. Ahmed, and O. Nour-El-Din End-Use Profile Development from Whole-Building Data Combined with Intensive Short-Term Monitoring by R.P. Mazzucchi	117 ⁻ 1180
	- by this mackuoun	1100

AN-92-16	Residential Kitchen Ventilation Technology Residential Kitchen Ventilation—A Guide for the Specifying Engineer by D.W. Wolbrink and J.R. Sarnosky Design Considerations for Master Kitchen Exhaust Systems by G.M. Elovitz Ventilation Efficiency and Thermal Comfort in Commercial Kitchens by J.S. Pekkinen and T.H. Takki- Halttunen	1187 1199 1214
	Computational Simulation of Kitchen Airflows with Commercial Hoods by R.M. Kelso, L.E. Wilkening, E.G. Schaub, and A.J. Baker Building Construction Regulation Impacts on Commercial Kitchen Ventilation and Exhaust Systems by D.R. Conover	1219
AN-92-17	Energy-Saving Potential of a Zoned Forced-Air Heating System by P. Oppenheim	1239 1247 1258 1266
AN-92-18	The Causes and Control of Mold and Mildew in Hot and Humid Climates by W. Shakun	1275 1282 1293 1303
	SOCIETY BUSINESS	
ASHRAE C ASHRAE P Society Pre ASHRAE H ASHRAE Ir ASHRAE Ir	SHRAE Officers, Directors, Committee Members, and Staff Chapter Officers Past Meetings Posidents Honors and Awards Intersociety Representatives International Associates Chnical and Symposium Papers, Volume 98, Part 1	. 1317 . 1319 . 1320 . 1321 . 1329 . 1330