PRELIMINARY PROGRAM

Advances in Cement and Concrete IX:
Volume Changes, Cracking, and Durability

August 10-14, 2003

Copper Mountain, Colorado

Conference Chair

David A. Lange
University of Illinois at Urbana-Champaign

Conference Co-Chairs

Karen Scrivener
Ecole Polytechnique Federale de Lausanne

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Program Overview

The program consists of nine technical sessions and a poster session. Each technical session will be led by an invited speaker (45 min), three additional speakers (30 min each), followed by open discussion (30 min).

Technical sessions will be held in the morning and the late afternoon, allowing for free time in early afternoon.

The poster session will be held Tuesday afternoon.

Dinner will be served daily at 7:15, and a banquet will be held on Wednesday evening.

Sunday, August 10

2:30 pm – 4:30 pm	Registration
4:15 pm	Conference Welcome and Overview
4:30 pm – 5:15 pm	Keynote Speaker: Francis Young, Professor Emeritus, University of Illlinois, Urbana, IL USA BRINGING CONCRETE INTO THE 21ST CENTURY
5:15 pm – 7:15 pm	**Session 1: Hydration mechanisms and microstructure** **Session Leader: Karen Scrivener, Swiss Federal Institute of Technology at Lausanne, Switzerland**
05:15 pm – 05:45 pm	Karen Scrivener, Swiss Federal Institute of Technology at Lausanne, Switzerland ETTRINGITE MYTHS, REALITIES AND CHALLENGES
05:45 pm – 06:15 pm	Maria Garci Juenger, University of Texax-Austin, USA EXAMINING CEMENT HYDRATION IN SITU USING SOFT-XRAY TRANSMISSION MICROSCOPY
06:15 pm – 06:45 pm	Anton K. Schindler, Auburn University, USA INFLUENCE OF MINERAL ADMIXTURES ON THE HEAT OF HYDRATION OF CONCRETE
06:45 pm – 07:15 pm	Open Discussion
7:15 pm – 09:00 pm	Dinner
9:00 pm – 10:00 pm	Opening Reception

Monday, August 11

7:00 am – 8:30 am	Breakfast
8:45 am	**Session 2: Thermal volume change, chemical shrinkage, self-dessication** **Session Leader: Erik Sellevold, Norwegian University of Science and Technology, Norway**
8:45 am – 9:30 am	Erik Sellevold, Norwegian University of Science and Technology, Norway THERMAL EXPANSION COEFFICIENT (CTE) OF CEMENT PASTE: EFFECT OF MOISTURE CONTENT
9:30 am – 10:00 am	Jan-Erik Jonasson, Lulea University of Technology, Sweden SPLITTING OF THERMAL DILATATION AND SHRINKAGE IN EARLY AGE CONCRETE
10:00 am – 10:30 am	Coffee Break
10:30 am – 11:00 am	Thomas A. Bier, Technische Universitat Bergakademie Freiberg, Germany EARLY SHRINKAGE AND MICROSTRUCTURE IN RAPID SETTING MORTARS
11:00 am – 11:30 am	Tor Arne Hammer, SINTEF, Norway FUNDAMENTAL ASPECTS REGARDING THE PORE WATER PRESSURE AND VOLUME CHANGE OF CONCRETE BEFORE AND DURING SETTING
11:30 am – 12:00 noon	Open Discussion
12:15 pm – 01:30 pm	Lunch
01:30 pm – 04:00 pm	*ad hoc* discussion/free time for recreation
04:00 pm – 04:30 pm	Afternoon Coffee
04:30 pm	**Session 3: Autogenous shrinkage and self-curing strategies** **Session Leader: Ole Jensen, Technical University of Denmark**
04:30 pm - -5:15 pm	Ole Jensen, Technical University of Denmark TECHNIQUES FOR INTERNAL WATER CURING OF CONCRETE

05:15 pm – 05:45 pm	E.A.B. Koenders, Delft University of Technology, The Netherlands MOISTURE FLOW BY MICRO-STRUCTURAL CONTRACTION

Monday, August 11 - continued

05:45 pm – 06:15 pm	Pietro Lura, Technical University of Denmark MEASUREMENT OF WATER TRANSPORT FROM SATURATED PUMICE AGGREGATES TO HARDENING CEMENT PASTE
06:15 pm – 06:45 pm	Neal S. Berke, W. R. Grace and Co, USA EFFECTIVENESS OF SHRINKAGE REDUCING ADMIXTURES IN REDUCING TOTAL SHRINKAGE
06:45 pm – 07:15 pm	Open Discussion
07:15 pm – 09:00 pm	Dinner
09:00 pm – 10:00 pm	Social Hour

Tuesday, August 12

7:00 am – 8:30 am	Breakfast
8:45 am	**Session 4 (*concurrent with 5*): New microstructure characterization techniques** **Session Leader: Kim Kurtis, USA**
08:45 am – 09:30 am	Kim Kurtis, Georgia Institute of Technology, USA MICROSCOPY OF CEMENT-BASED MATERIALS: SHOULD WE CONSIDER A BIOLOGICAL APPROACH?
09:30 am – 10:00 am	Thomas Van Dam, Michigan Technological University, USA APPLICATIONS OF THE X-RAY MICROSCOPE TO THE CHARACTERIZATION OF CONCRETE MICROSTRUCTURE
10:00 am – 10:30 am	Coffee Break
10:30 am – 11:00 am	Paul Stutzman, NIST, USA IMAGING CEMENT MICROSTRUCTURE BY SCANNING ELECTRON MICROSCOPY
11:00 am – 11:30 am	P.A.M. Basheer, Queen's University Belfast INTERFACIAL POROSITY OF CONCRETE USING GAUSSIAN SEGMENTATION AND MANUAL THRESHOLDING OF BSE IMAGES
11:30 am – 12:00 noon	Open Discussion
08:45 am	**Session 5 (*concurrent with 4*): Transport and Rate-Controlled Processes** **Session Leader: Doug Hooton, Canada**
08:45 am – 09:30 am	Doug Hooton, University of Toronto, Canada STUDIES ON DEVELOPMENT OF NEAR-SURFACE, FLUID PENETRATION RESISTANCE OF CONCRETE FOR USE IN SELECTING APPROPRITE CURING REGIMES
09:30 am – 10:00 am	Yunping Xi, University of Colorado, USA A NEW TESTING METHOD FOR DETERMINING THE COUPLING EFFECT OF CHLORIDE DIFFUSION ON MOISTURE TRANSFER IN CONCRETE
10:00 am – 10:30 am	Coffee

Tuesday, August 12 - continued

10:30 am – 11:00 am	Susanne Kasparek, Institute of Building Physics and Material Science, University of Essen, Germany TEMPERATURE AND MOISTURE DISTRIBUTION IN CONCRETE CAUSED BY TRANSPORT UNDER FREEZE-THAW ATTACK - CONSEQUENCES FOR TESTING
11:00 am – 11:30 am	Kenneth A. Snyder. NIST, USA PHYSICO-CHEMICAL TRANSPORT-REACTION SERVICE LIFE COMPUTER MODELS: A THERMODYNAMIC APPROACH TO PERFORMANCE PREDICTION OVER VARYING TIME SCALES
11:30 am – 12:00 noon	Open Discussion
12:15 pm – 01:30 pm	Lunch
01:30 pm – 04:00 pm	**Poster Session**
04:00 pm – 04:30 pm	Afternoon Coffee
04:30 pm	**Session 6: Drying shrinkage and creep & elastic properties** **Session Leader: Kosta Kovler, Technion, Israel**
04:30 pm – 05:15 pm	Kosta Kovler, Technion, Israel HISTORICAL REVIEW AND FUTURE TRENDS OF SHRINKAGE AND CREEP RESEARCH
05:15 pm – 05:45 pm	Shingo ASAMOTO, The University of Tokyo, Japan INFLUENCE OF LIQUID CHARACTERISTIC AND ITS DISTRIBUTION IN MICRO-PORE ON TIME-DEPENDENT MECHANICAL BEHAVIOR OF CONCRETE
05:45 pm – 06:15 pm	Emmanuel K. Attiogbe, Master Builders, Inc., USA CRACKING POTENTIAL OF CONCRETE UNDER RESTRAINED SHRINKAGE
06:15 pm – 06:45 pm	J. J. Beaudoin, National Research Council, Canada DIMENSIONAL CHANGE AND ELASTIC BEHAVIOR OF HARDENED PORTLAND CEMENT PASTE,MONTMORILLONITE AND 1.4 NM TOBERMORITE: A COMPARATIVE STUDY
06:45 pm – 07:15 pm	Open Discussion
07:15 pm	Dinner

09:00 pm – 10:00 pm **Poster Session** continued with Social Hour

Wednesday, August 13

07:00 am – 08:30 am	Breakfast
08:45 am	**Session 7 Volume change from deleterious chemical reactions** **Session Leader: Paulo Monteiro, USA**
08:45 am – 09:30 am	Paulo Monteiro, University of California - Berkeley, USA VOLUME CHANGES DUE TO DELETERIOUS REACTIONS
09:30 am – 10:00 am	Carolyn Hanson, University of Waterloo, Canada CORROSION OF REINFORCING STEEL IN CRACKED HIGH PERFORMANCE CONCRETE
10:00 am – 10:30 am	Coffee Break
10:30 am – 11:00 am	Sidney Diamond, Purdue University, USA DRY DENSIFIED SILICA FUME - IS IT WHAT THEY SAY IT IS?
11:00 am – 11:30 am	C.P. Ostertag, University of California - Berkeley, USA EFFECT OF STEEL MICROFIBERS ON EXPANSION, REACTION PRODUCTS AND MECHANICAL PROPERTIES DUE TO ALKALI SILICA REACTION
11:30 am – 12:00 noon	Open Discussion
12:15 pm – 01:30 pm	Lunch
01:30 pm – 04:00 pm	*ad hoc* discussion/free time for recreation
04:00 pm – 04:30 pm	Afternoon Coffee
04:30 pm -	**Session 8 Cracking and Fracture** **Session Leader: Henrik Stang, Denmark**
04:30 pm – 05:15 pm	Henrik Stang, Technical University of Denmark CRACKING AND FRACTURE IN EARLY AGE CONCRETE
05:15 pm – 05:45 pm	Jason Weiss, Purdue University, USA TIME-DEPENDENT FRACTURE PROCESSES IN VOLUMETRICALLY RESTRAINED FIBER REINFORCED CONCRETE
05:45 pm – 06:15 pm	Nick Buenfeld, Imperial College, London HEALING OF CRACKS IN CONCRETE

Wednesday, August 13 - continued

06:15 pm – 06:45 pm	E. Schlangen, Delft University of Technology, The Netherlands MULTI-SCALE MODELING OF CRACK FORMATION IN THE CONCRETE COVER ZONE
06:45 pm – 07:15 pm	Open Discussion
07:15 pm	Dinner
09:00 pm – 10:00 pm	Social Hour

Thursday, August 14

07:00 am – 08:30 am	Breakfast
08:45 am	**Session 9 Service Life -- modeling, transport, and forensic issues** **Session Leader: Mike Thomas,** University of New Brunswick, **Canada**
08:45 am – 09:30 am	Mike Thomas, University of New Brunswick, Canada ISSUES RELATED TO SERVICE LIFE MODELS FOR REINFORCED CONCRETE STRUCTURES
09:30 am – 10:00 am	Vellore Gopalaratnam, University of Missouri-Columbia, USA HIGH PERFORMANCE CONCRETE FOR BRIDGE APPLICATIONS – ISSUES RELATED TO DURABILITY AND TIME-DEPENDENT RESPONSE
10:00 am – 10:30 am	Coffee Break
10:30 am – 11:00 am	Daniel P. Johnston, South Dakota Department of Transportation, USA IMPLICATIONS OF EXISTING ALKALI-SILICA REACTION FOR REPAIR AND REHABILITATION OF PCC PAVEMENTS AND STRUCTURES
11:00 am – 11:30 am	Doug Burke, NFESC (U.S. Navy) PREDICTION OF THE LONG-TERM DURABILITY OF LIGHTWEIGHT AGGREGATE CONCRETE MIXTURES UNDER SEVERE MARINE ENVIRONMENT
11:30 am – 12:00 noon	Open Discussion
12:15 pm	Boxed lunch and Departure

POSTER SESSION, Tuesday, August 12

David A. Lange, University of Illinois, USA	MEASUREMENT AND INTERPRETATION OF INTERNAL RELATIVE HUMIDITY IN CONCRETE
A. Palomo, 'Eduardo Torroja' Institute, Spain	ALKALI-ACTIVATED FLY ASH CONCRETE: SOME IMPORTANT DIFFERENCES WITH THE OPC CONCRETE
A. Shvarzman, Negev Academic College of Engineering, Israel	MECHANISMS OF HYDRATION, PROPERTIES AND MICROSTRUCTURE OF CEMENTITIOUS SYSTEMS MADE WITH METAKAOLIN
A.J. Breunese, TNO Building and Construction Research, The Netherlands	TENSILE PROPERTIES OF CONCRETE DURING FIRE
Agnes Nagy, Jönköping University, Sweden	EFFICIENCY ASSESMENT OF CRACK CONTROL MEASURES IN EARLY AGE CONCRETE STRUCTURES
Alice Pop, National Institute for Cement CEPROCIM, Romania	EFFECT OF ACID CORROSION AT CURING CEMENT TYPE I
Anton K. Schindler, Auburn University	PREDICTION OF CONCRETE SETTING
Chunxiang Qian, Southeast University, China	EARLY CRACK RESISTANCE AND FIRE SPALLING ALLEVIATION OF CONCRETE BY ADDITION OF POLYPROPYLENE FIBERS
David Trejo, Texas A&M University, USA	IDENTIFICATION AND CHARACTERIZATION OF CONCRETE MATERIAL PARAMETERS INFLUENCING CORROSION-INDUCED CRACKING
Edward C. Vincent, Virginia Tech, USA	COMPRESSIVE CREEP OF A LIGHTWEIGHT, HIGH STRENGTH CONCRETE MIXTURE
Fumiaki Matsushita, Sumitomo Metal Mining Siporex Co., Ltd, Japan	CALCIUM SILICATE STRUCTURE AND CARBONATION SHRINKAGE OF A TOBERMORITE-BASED MATERIAL
Gary S. Wojcik, National Institute of Standards and Technology, USA	THE INFLUENCE OF THE ATMOSPHERE ON CURING CONCRETE TEMPERATURES AND MATURITY
Guang Ye, Delft University of Technology, The Netherlands	A MODEL FOR PERMEABILITY OF POROUS CEMENTITIOUS MATERIAL VALIDATED WITH EXPERIMENTS
Ha-Won Song, Yonsei	MICROSTRUCTURE-BASED

University, Japan	ESTIMATION OF DIFFUSIVITY AND PERMEABILITY OF SILICA FUME CONCRETE
J. Mauricio Ruiz, The Transtec Group, Inc., USA	PREDICTION OF HEAT TRANSPORT IN CONCRETE MADE WITH BLAST FURNACE SLAG AGGREGATE USING THE HIPERPAV MODEL
Jan-Erik Jonasson, Luleå University of Technology, Department of Civial and Mining Engineering	FULL SCALE LABORATORY TESTS OF RESTRAINT SITUATION IN WALL ON SLAB
Jan-Erik Jonasson, Lulea University of Technology, Sweden	MODELLING OF CREEP AND SHRINKAGE IN HIGH PERFORMANCE CONCRETE
Jan-Erik Jonasson, Lulea University of Technology, Sweden	LINEAR LOGARITHMIC MODEL FOR CONCRETE CREEP - FORMULATION, EVALUATION AND PREDICTION FORMULAS
Jason H. Ideker, The University of Texas at Austin, USA	DO SILICA FUME AGGLOMERATES CAUSE ASR RELATED EXPANSION?
Kamran M. Nemati, University of Washington, USA	PREDICTING ELASTIC MODULI OF CONCRETE USING MOLTEN METAL INJECTION METHOD
Kazuo Yamada, Taiheiyo Cement Corp., Japan	WORKING MECHANISM OF A SHRINKAGE-REDUCING SUPERPLASTICIZER OF NEW GENERATION
Kevin L.Rens, University of Colorado at Denver, USA	THE MATURITY METHOD USING VARIABLE TEMPERATURE
Long-yuan Li, Aston University, UK	MODELLING OF CRACK CLOSURE OF REINFORCED CONCRETE BY ELECTRODEPOSITION TECHNIQUE
M. Boulfiza, University of Saskatchewan, Canada	EFFECTS OF EVOLVING CRACKS ON CHLORIDES PENETRATION IN CONCRETE UNDER EXTERNAL LOADING
M. Naderi, Imam Khomeini International University, Iran	ASSESSING THE EFFECTS OF DIFFERENT CURING SYSTEMS ON CONCRETE COVER USING FRICTION-TRANSFER METHOD
M. Toader, CEPROCIM S.A., Romania	PROPERTIES OF LOCAL BLAST FURNACE SLAG AND THEIR USE IN III/A CEMENT TYPE
M. Toader, CEPROCIM S.A., Romania	PROPERTIES OF LOCAL BLAST FURNACE SLAG AND THEIR USE IN III/A CEMENT TYPE

M.A.Taher, Al-Azhar Univ., Assiut, Egypt	EFFECT OF HEAT TREATMENT ON THE BRHAVIOR OF MONTMORILLONITE CLAY IN PRESENCE OF LIME
M.R. de Rooij, TNO Building and Construction Research	PREDICTIONS OF CHLORIDE PENETRATION BASED ON CHLORIDE PROFILE ANALYSIS
Mamadou Fall, University of Quebec in Abitibi-Temiscamingue, Canada+B14	AN EFFICIENT AND ROBUST STATISTICAL MODELING APPROACH TO EVALUATE THE EFFECT ON INTERNAL SULPHATE ATTACK ON PASTE BACKFILL STRENGTH
Marten Larson, Lulea University of Technology, Sweden	ESTIMATION OF CRACK RISK IN EARLY AGE CONCRETE´ - SIMPLIFIED DIRECT METHODS FOR PRACTICAL USE
Martin Nilsson, Luleå University of Technology, Sweden	DETERMINATION OF RESTRAINT I EARLY AGE CONCRETE WALLS ON SLABS
Mauricio Lopez, Georgia Institute of Technology, USA	STRAIN DISTRIBUTION AND DEFORMATION MECHANISMS IN CREEP OF HIGH PERFORMANCE LIGHTWEIGHT CONCRETE
Mickael Theiry, Laboratoire Central des Ponts et Chaussées, France	EFFECT OF CARBONATION ON DENSITY, MICROSTRUCTURE AND LIQUID WATER SATURATION OF CONCRETE
Øyvind Bjøntegaard, The Norwegian University of Science and Technology, Norway	CRACKING TENDENCY OF HPC DURING THE FIRST HOURS AFTER SETTING: RELATION BETWEEN FRESH CONCRETE PROPERTIES AND EARLY AUTOGENOUS SHRINKAGE
P.A. Muhammed Basheer, Queen's University Belfast	STRENGTH AND DRYING SHRINKAGE PROPERTIES OF CONCRETE CONTAINING FURNACE BOTTOM ASH AS FINE AGGREGATE
Peeyush Kumar, Institute of Technology, Banaras Hindu University, India	SELF-COMPACTING CONCRETE METHODS OF TESTING AND DESIGN
Stephanie Staquet, University of Brussels, Belgium	EFFECTS OF HEAT TREATMENT ON CREEP FUNCTIONS OF HPC LOADED AT VERY EARLY AGE
Tetsuya Ishida, University of Tokyo, Japan	MODELING OF CHLORIDE EQUILIBRIUM AND TRANSPORT IN CEMENTITIOUS MATERIALS
V. Baroghel-Bouny, Laboratoire Central des Ponts	AUTOGENOUS DEFORMATIONS OF CEMENT PASTES: MICRO-MACRO

et Chaussées, France	RELATIONSHIPS AND THRESHOLD EFFECTS
Will Hansen, University of Michigan, USA	THERMAL COEFFICIENT OF EXPANSION OF WATER-SATURATED COARSE AGGREGATE -AMBIENT AND SUB-AMBIENT TEMPERATURE RANGE
Xiaoqiang Hou, University of Illinois at Urbana-Champaign, USA	THE STRUCTURE OF ASR GEL AND ITS RELATIONSHIP TO C-S-H
Xiaosheng Wei, Hong Kong University of Science and Technology	INFLUENCE OF THE SUPERPLASTICIZER ON THE EARLY BEHAVIOR OF PORTLAND CEMENT USING ELECTRICAL RESISTIVITY
Zhaozhou Zhang, Boral Material Technologies, Inc., USA	DELAYED ETTRINGITE FORMATION: SEQUENCE OF EVENTS