1st International Conference on Rubber Compounding

Rubber Compounding Asia 2010

2-3 March 2010, Century Park Hotel, Bangkok, Thailand

Organized by

TechnoBiz Communications Co., Ltd.

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Post-Conference Event

Technical Training Program

Solving Problems in Rubber Compounding and Processing

4 March 2010, Century Park Hotel, Bangkok, Thailand

1st International Conference on Rubber Compounding

Rubber Compounding Asia 2010

2-3 March 2010, Century Park Hotel, Bangkok, Thailand

2 March 2010 (Tuesday)

08.00 - 09.00 Registration

09.00 - 09.15 **Welcoming Remarks**

Session 1: Rubber Properties & Processability Improvement

(Session Chairman: Mr. John Dick, Alpha Technologies inc., USA)

09.15 -10.00 **In situ precipitation of Silica in Natural Rubber Latex for Improved Dispersion , Processability and Mechanical Properties**

Prof. Rani Joseph , Cochin University of Science and Technology , India

- Need for incorporation of silica in natural rubber for production of new green tires
- Details of precipitation of silica in natural rubber
- Evaluation of the filler distribution in the rubber matrix
- Characterization of the precipitated silica by various techniques like TEM, SEM, XRD , IR etc
- Effect of epoxidised natural rubber as coupling agent in silica filled natural rubber
- Evaluation of the processability and polymer filler interaction
- Evaluation of properties like tensile strength , tensile modulus , abrasion resistance etc

10.00 – 10.45 **Viscoelastic Behaviour of NR and NBR filled with fly ash**

Dr. Chakrit Sirisinha, Mahidol University, Thailand

- Role of fly ash on viscoelastic properties of rubber compounds
- Processability improvement via the ball-bearing effect provided by fly ash particles
- Storage instability of rubber compounds filled with fly ash particles
- Viscoelastic response comparison in fly ash filled NR and NBR compounds

10.45 – 11.00 Coffee Break

11.00 – 11.45 **Relaxation Behavior of Conductive Carbon Black Reinforced Chlorosulfonated Polyethylene Rubber Vulcanizates**

Prof. Deba Kumar Tripathy, Rubber Technology Centre, IIT Kharagpur, India

- Areas of application in electrical, electronics, aircraft, telecommunications and nuclear reactors.
- Preparation of highly conductive polymer composites
- Use of newly generated highly conductive carbon black, Ensaco 350G
- Effect of temperature and strain on viscoelastic properties of CSM rubber composites
- Effect of frequency on dielectric relaxation behavior of CSM rubber composites

11.45 – 12.30 **Using High Molecular Weight NBR Elastomer in Soft Printing Rolls**

Don Tsou, Lanxess Chemicals (Shanghai), China

- Affect of different NBR polymer (ACN, mooney viscosity)
- Basic compounding approach to low hardness (<35 Shore A) roll compounds
- Advantage of using high MW NBR to processing and performance of soft printing rolls
- Plasticizer selection and the use of high MW plasticizer extended NBR grades
- Introduce a phthalate free, plasticizer extended NBR grade

12.30 – 13.30 LUNCH BREAK

Session 2: Rubber Testing

(Session Chairman: Dr. Chakrit Sirisinha, Mahidol University, Thailand)

13.30 – 14.15 **New Test Methods for Characterizing and Assuring the Performance of Carbon Black and Other Reinforcing Agents in Tire Compounds**

John Dick, Alpha Technologies Inc. USA

- New rheological test innovations to measure carbon black and silica effects
- Testing for carbon black dispersion and quality of mix differences
- Using the "strain softening effect" in processability
- Measuring the effects of carbon black surface area and structure
- Measuring the effects of surface activity
- Quantifying the degree of in-situ silanization of silica during mixing
- Rapid measures of filler reinforcement
- Direct measures of viscous heating and cured heat buildup
- Filler loading effects on viscous heating
- New standardized tests using RPA to study filler effects

14.15 – 15.00 **Rubber Testing with a New Software Testing Platform for Dynamic Mechanical Analysis**

Laurent Perier, 01dB-Metravib, France

- A new METRAVIB software testing platform for Dynamic mechanical analysis
- Generation of quantitative dynamic property data of rubber compounds for modeler and user: glass transition, Payne and Mullins effect, heat build-up, frequency response, creep,
- testing conditions close to the real products life conditions
- Duplication of the shear field experienced at the edge of steel belt radial tires

15.00 – 15.30 Coffee / Tea Break

15.30 – 16.15 **Utilizing the RPA Variable Temperature Analysis for more Effective Tire Quality Assurance**

John Dick, Alpha Technologies Inc. USA

- Fundamentals of variable temperature analysis for cure simulation of thick rubber articles.
- Use of cure equivalents
- Typical time-temperature profiles
- Comparisons of Rubber Process Analyzer Time-Temperature profiles for passenger tires
- Comparisons of RPA Time-Temperature profiles for truck tires
- Comparison of nine different wire coat and undertread compounds regarding VTA.
- Comparison of scorch and cure rate measurements with VTA vs. conventional isothermal cures.

16.15 – 17.00 **Dynamic and Static Rubber Testing with Ozone - a Practical Experience Report**

Prof. Klaus Nonnenmacher, Anseros Klaus Nonnenmacher GmbH, Germany

- The new standards for rubber testing with ozone
- Construction and design of an ozone climate simulator
- Practical test procedures with life example during presentation
- ANSEROS test tools
- Comparison of ortho-directive and longitudinal-directive air flow
- How to meet the new requirements of ISO 1431, ASTM D 1149, DIN 53509

17.00 – 18.00 Panel Discussion—Technical Challenges of Rubber Compounders

18.00 – 19.30 **Cocktail Networking Dinner**

Session 3: Rubber Chemicals/Properties Improvement

(Session Chairman: Prof. Rani Joseph, Cochin University of Science and Technology , India)

08.30 –09.15 **Improvement of Rubber Compounding Process with Functional Process Promoters**

Dr. Ruliang Fan, RheinChemie (Qingdao) Ltd., China

- Principle of Processing Promoters
- Replacement of toxic aromatic oil by processing promoter.
- Processing Promoter for carbon black tire tread compound
- Solution for processing for silica/carbon black tire tread compounding
- Zinc free processing promoter for silica tire technology
- Synergistic combinations of dithiophosphates with Aflux 37
- Guidelines of processing promoters for tire application

09.15 – 10.00 **Recent Developments in the Properties of the Purified Natural Rubber**

Dr. Jitladda Sakdapipanich, Mahidol University, Thailand

- Why does NR show outstanding properties
- Advantages and disadvantage properties of NR
- Properties of deprotenized NR
- Coagulation Process of SAP-NR Latex
- Properties of SAP-NR Rubber

10.00 -10.45 **Effect of Halloysite Nanotubes (HNTs) as a Novel Filler on Properties of EPDM Nanocomposites**

Prof. Hanafi Ismail,Universiti Sains Malaysia (USM), Malaysia

- Characterization and properties of Halloysite nanotubes (HNTs)
- Effect of HNTs loading on properties of EPDM Compounds
- Effect of compatibilization of EPDM/HNTs nanocomposites
- Effect of modification of HNTs on properties of EPDM/HNTs nanocomposites.

10.30 – 11.00 Coffee / Tea Break

Session 4: Rubber Extrusion

(Session Chairman: Mr. John Dick, Alpha Technologies inc., USA)

11.00 – 11.30 **Fine Mesh Straining and Extrusion Applications with Gear Pump Systems for Rubber and Silicone Elastomers**

Horst Hain, UTH GmbH, Germany

- History and todays technologies
- Straining applications
- High Pressure applications
- Function principle and process technological basics
- Extrusion applications

11.30 – 12.00 **The Planetary Roller Extruder and Rubber Processing**

Michael W. Batton, ENTEX Rust & Mitschke GmbH, Germany

- General function, explanation and history
- General operation and Physics
- Adaption for continuous production methods
- Physical setup
- Energy Balance and Control possibilities
- Areas of application in Rubber Processing

12.00 – 12.30 **Continuous Rubber Compounding with the RingExtruder**

Jürgen Sauer, Extricom GmbH, Germany

- RingExtruder, a multible screw Extruder on it`s way to success.
- For rubber compounding :-
  - Low product temperature
  - Low energy input
  - narrow residence time distribution
  - Excellent mixing
  - very good cooling capacity
  - very good self cleaning

12.30 – 13.00 **Continuous Vulcanizable Rubber Compounding using a Co-Rotating Twin Screw Extruder**

Dr. Alessandro GALLO, F.LLI MARIS S.P.A., Italy

- continuous rubber compounding *vs* traditional system,
- environmental impact,
- energy saving

13.00 – 14.00 LUNCH BREAK

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Session 5: Rubber Composites

(Session Chairman : Prof. DK Tripathy)

14.00 – 14.45 **Nanocomposites based on LDPE-EVA Thermoplastic Elastomer (TPE): Effect of Silica Nano-filler and EB Irradiation**

Prof. T K Chaki, Rubber Technology Centre, IIT Kharagpur, India

- History and growth of TPE nanocomposites
- Structure and property relation
- Bulk morphology
- Dynamic and Capillary Rheological properties
- Thermal and Thermo-oxidative degradation
- Areas of applications

14.45 - 15.30 **Mechanical and Dynamic Mechanical Property Evaluation of NR/SBR/BR Composites based on a Tyre Tread Formulation**

Ms. Dilhara Edirisinghe, Rubber Research Institute of Sri Lanka

- Commercial importance of blending rubbers
- Review of factors affecting properties of a rubber blend
- Importance of dynamic mechanical property analysis of tyre compounds
- Comparison of properties of NR, SBR and BR
- Compounding and vulcanization of NR/SBR/BR composites
- Evaluation of mechanical and dynamic mechanical properties of the composites
- Recommendation of a formulation suitable for tyre treads

15.30 – 16.00 Coffee / Tea Break

16.00 - 17.00 Panel Discussion—Technical Challenges of Rubber Compounders

17.00 Closing Remarks

Remark : *The organizer reserves the right to change technical program as appropriate without prior notification*

All the presentations will be conducted in ENGLISH only

Organizer Profile : TechnoBiz Communications Co., Ltd.

TechnoBiz Communications Co., Ltd., established in 2005,
is specialized in organizing technical conferences / seminars / training programs for rubber and plastic industries in Asia.
It also publishes technical journal and markets technical publications for rubber and plastic industries.

Upcoming TechnoBiz Conferences in 2010

Plastic Extrusion Asia 2010 *(29-30 March 2010, Kuala Lumpur)*
Plastic Injection Molding Asia 2010 *(2-3 August 2010, Bangkok)*
Rubber Molding Asia 2010 *(23-24 August 2010, Kuala Lumpur)*

More information about ***TechnoBiz*** can be found at **www.technobiz-asia.com** .

International Training Program

Solving Problems in Rubber Compounding and Processing

4 March 2010, Century Park Hotel, Bangkok, Thailand

(Instructor : John Dick, Alpha Technologies Inc., USA) (9 am to 5 pm)

Rubber is different from other engineering materials in that it is commonly subject to many unique processing problems that are not normally encountered with the processing of other non-rubber materials. In addition, the literature is somewhat limited in discussing some of these problems and their causes. This program gives a review of the literature for some of the major factory problems encountered in the rubber production plant with some suggestions for possible causes and solutions.

For the plant receiving area, a review of cold flow and stability of pre-powder blend properties is discussed. For the mixing process, the focus is directed to state of mix measurements such as uncured elasticity (nerviness), viscosity and dispersion as well as bloom, green strength, tack, stickiness (to metal surfaces), lumps, mill bagging, and mill back rolling. For extrusion, a discussion of the literature is given for die swell, smoothness (appearance of the extrudate) and limitations for extrusion rate (melt fracture). For calendering: blisters and calender release are reviewed. Problems associated with curing that are reviewed are mold release, mold fouling, non-fills, porosity, mold shrinkage and backrinding.

Program Outline

Introduction to Factory Problems : Plant receiving area ; Cold flow; Stability of pre-powdered blends

Mixing : Quality of mix ; Uncured elasticity (nerviness) ; Viscosity ; Dispersion ; Bloom ; Green strength ; Tackiness ; Stickiness; Lump-mill bagging ; Mill back rolling

Extrusion : Die swell; Extrusion rate ; Appearance (surface smoothness of extrudate) ; Shear thinning

Calendar Release : Blisters ; Calender release

Molding : Mold release; Mold filling ; Non-fills; Porosity; Shrinkage of the cured part ; Backrinding

Statistics and Methodologies for Solving Factory Problems : Basic statistical methods to identify special causes of Variation; Important principles of Statistical Process Control; Random variation vs. special causes; Establishing control limits and specification limits; Methods to detect special causes of variation

Corrective Actions in the Short Term : Develop a SOP for taking corrective actions for short-term problems; Develop a strategy for establishing long-term solutions to chronic problems; Brainstorming for solutions to problems; Cause and effect diagrams

Six Sigma Techniques for Solving Chronic Rubber Factory Problems : Methodology; Statistical methods; Examples of success in the rubber industry

Nature and Techniques for Solving Problems in Rubber and Compounding and Processing : Changing one variable at a time techniques for improvement of a rubber compound -- Advantages and disadvantages—Applying a Design of Experiment -- Advantages and disadvantages; Interactions -- Multiple response interactions of compound properties - Chemical interactions of compounding ingredients

Case Studies of Rubber Compounding and Processing Problems : Different case studies that include processing and compounding problems will be discussed and reviewed in interactive groups. Then overall discussions will take place to discuss possible solutions and methodologies.

Language : ENGLISH

Program Instructor - John Dick

John Dick has over Thirty years of experience in the rubber industry. He was with BF Goodrich and later Uniroyal Goodrich Tire Co. as a Section Manager and Development Scientist in R & D until 1991 when he joined Monsanto's Rubber Instruments Group (now Alpha Technologies) as a Senior Marketing Technical Service specialist. Mr. Dick has authored over 60 journal and magazine publications and four books on rubber technology. He received the Monsanto Master Technical Service Award in 1994, the ACS Rubber Division "Best Paper Award" in 1995 and the University of Akron and University of Wisconsin Appreciation Awards in 1998 and 2005 respectively for Teaching rubber compounding and testing courses in their continuing education programs. He is a Fellow in the American Society for Testing and Materials (ASTM) receiving the Award of Merit in 1990 and Distinguished Service Award in 2005. Also he has represented the United States as a delegate to the International Standards Organization (ISO) for the last 22 years. He was appointed in 1992 to be Leader of the U.S.A. Delegation to ISO TC-45 on Rubber. He teaches five rubber technology courses at University of Akron and University of Wisconsin continuing education departments. He is a member of the American Chemical Society, Society of Rheology, and ASQ with a CQE and CQA. He is also a representative to the RMA and has Recognition in *Who's Who in America*. Mr. Dick received his B.S. degree from Virginia Polytechnic Institute in 1970 and an M.A. from the University of Akron in 1979. He is married with two children and his hobbies include photography and amateur radio.

Registration Form- Rubber Compounding Asia 2010

(Please complete all the information in ENGLISH and Capital Letters only)

We would like to register

- ❑ Conference - **Rubber Compounding Asia 2010** *(2-3 March 2010, Bangkok)*
- ❑ Training - **Solving Problems in Rubber Compounding** *(4 March 2010, Bangkok)*
- ❑ **Both Programs** *(2-4 March 2010, Bangkok)*

Company Name ……

Address ……

……

Tel…… Fax…… Email……

Contact Person …… Mobile…… Email……

Participant Names

Participant 1 …… Position…… Email ……

Participant 2 …… Position…… Email ……

Participant 3 …… Position…… Email ……

Participant 4 …… Position…… Email ……

Registration Fee / delegate (US$)

Event Name	Registration Fee / Participant
Rubber Compounding Asia 2010	600 US$
Training (4 March10)	500 US$
Both Programs	950 US$

Remarks : Payment is required with registration. Registration fee includes documentation, lunch and refreshments.

Group Registration : If 3 or more than 3 delegates from the same organization, 10% discount will be offered on the registration fee. If 5 delegates join from the same organization, 6th delegate participation is FREE.

Payment Method

❑ Bank Transfer to Bangkok Bank, A/C No: 177-0-70727-9, A/C Name: TechnoBiz Communications Co., Ltd. Ratchada-Latphrao Branch, Swift Code :BKKBTHBK

(Kindly make payment for all bank charges and fax bank pay-in slip to TechnoBiz)

❑ Credit Card ❍ Visa ❍ Master *(5% bank fee for credit card processing will be applied)*

Card Number ……

Cardholder Name ……

Last 3 digits on signature panel …… Card Expiry Date……

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Please send completed registration form to

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