

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 calendaring: 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.

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.

Language : ENGLISH

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	Before 31 January 10	Before 15 February 10	After 15 February 10
Rubber Compounding Asia 2010	400 US\$	500 US\$	600 US\$
Training (4 March10)	300 US\$	400 US\$	500 US\$
Both Programs	650 US\$	750 US\$	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.
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