Chatsworth●Hall

"Strategies for the Continuous Pursuit of Knowledge"

A Comprehensive Intensive Training Course on "Rubber Technology"

Kuala Lumpur Convention Centre
Kuala Lumpur City Centre, Malaysia

Thursday & Friday, July 22nd & 23rd, 2010

Presented by :

Mr Sam Angove

enys international

Singapore

NB: Previous Courses run by Chatsworth Hall have received full support from the Malaysian HRDB

Supported by:

The Plastics and Rubber Institute of Malaysia

The Plastics and Rubber Institute of Singapore

Rubber Technology
A Comprehensive Training Course

Introduction:

This course focuses on the history, development, applications and technology of natural and synthetic rubbers. It offers a thorough and comprehensive coverage of the main aspects of rubbers – both natural and synthetic – as well as the major fabrication processes, with emphasis on compounding along with additives, specific applications, properties and testing. Latex technology will also be covered.

"Rubber is as indispensable to modern society as steel and wood and mortar. We use products made of rubber at work, at home, at play, even when we travel. Automobiles, trains and aircraft rely on it for safety and comfort. Industry uses it to produce hoses, belts, gaskets, tires, mouldings, and thousands of other products. Rubber in the modern world is omnipotent" (Ralph Wolfe)

It will therefore serve a wide range of interest groups from non-technical personnel - management, finance, logistics and R&D, materials management, human resources and planning functions - working within the rubber and related industries (including OEM companies engaged in automotive manufacturing, medical devices, packaging, etc), to technical personnel and sales staff, already knowledgeable in their own field of application, yet who may require a refresher course or more fundamental coverage of other aspects of rubber technology.

About the Workshop Leader:

Sam Angove is the Managing Director of enys international pte ltd., a Singapore based polymer consultancy practice focused on the Asia Pacific Region. He is also an Associate of Nexant Inc/Chem Systems an international consultant on Oil & Gas, Petrochemicals, Oil Refining, Specialty Chemicals and Finance. Sam has 45 years experience in the polymer industry that includes holding senior positions in the Polysar Group (now Nova and Lanxess), a multinational company where he has directed Technical, Marketing & Sales, Materials Management, Business Planning & Development and Corporate Strategy functions and he was the General Manager of an international polymer business. The early days of his career were spent as the Head of the Rubber & Latex Technology Section at the Rubber Research Institute of Malaysia, Kuala Lumpur.

He has lived and worked in Asia, the Americas and Europe and has lectured extensively worldwide on rubber and plastics technology, marketing, economics and strategic planning etc. His other activities include being a founder member of the Institution of the Rubber Industry in Malaysia, which is now the Plastics & Rubber Institute of Malaysia (PRIM), and a past chairman of the Plastics and Rubber Institute (Singapore). In 2009 Sam was inducted into the PRIM Hall of Fame for his services to the Malaysian rubber industry.

Sam graduated in rubber and plastics science and technology at the National College of Rubber Technology, London and in International Business at the Centre D'Etude Industrielle, Geneva, Switzerland. He is an Honorary Life Vice-President of the Plastics and Rubber Institute in Malaysia, and Fellow of the Plastics and Rubber Institutes in Malaysia and Singapore.

Course Outline:

DAY 1: Thursday, July 22nd 2010

08:00 Registration
09:00 Introductions and Review of Course Objectives

SESSION 1 - INTRODUCTION:

- History and Statistics
- Basic Polymerization
- Types of Rubber
- Basic Technology
- Summary of Properties and Overview of Testing Methods
- Future of the Rubber Industry

SESSION 2 - NATURAL RUBBER:

- History
- Cultivation and Production
- Grades of Natural Rubber
- Standard Technical Rubber (e.g. SMR)
- Special Grades
- Properties

SESSION 3 - SYNTHETIC RUBBER:

- Synthesis
- Raw Material Sources
- Styrene Butadiene Rubbers (SBR)
- Butadiene Rubber – Polybutadiene (BR)
- Ethylene Propylene Rubber/Ethylene Propylene Diene Rubber (EPR/EPDM)
- Isoprene Isobutylene Rubber & Halogenated IIR (Butyl Rubbers - IIR & HIIR)
- Chloroprene Rubber (CR)
- Isoprene Rubber – Polyisoprene (IR)
- Polyisobutylenes (PIB)
- Acrylonitrile (Nitrile) Butadiene Rubbers (NBR & HNBR etc)
- Silicone Rubbers (MQ, MVQ & PVMQ etc)
- Fluoro Elastomers (FKM, FFKM & PVDF etc)
- Acrylate/Acrylic Rubbers (ACM) - Chorosulphonated Polyethylene (CSM)
- Epichlorohydrin Rubber (CO/ECO) - Polysulphide Rubbers (TP)
- Ethylene Vinyl Acetate (EVA)
- Thermoplastic Rubbers (TPE & TPV)
- Properties
- Applications

SESSION 4 - COMPOUNDING AND COMPOUNDING INGREDIENTS:

- Historical Rubber Compounds
- Basic Compounding
- Compounding Ingredients & their functions:
  - Curing Agents; Accelerators; Activators
  - Antioxidants & Antiozonants
  - Carbon Blacks; Silica; Whiting; China Clay (Kaolin)
  - Barytes; Blowing Agents; Plasticizers & Peptizers etc
- Effects of Ingredients on Rubber Properties.

DAY 2: Friday, July 23rd, 2010

SESSION 5 - PROCESSING AND MACHINERY (PART I):

- Stages in Processing
- Machinery:
  - Bale Cutters; Mills; Internal / Intensive Mixers; Stock Blenders; Automation
- Shaping Processes: Extrusion and Calendering
- Curing Processes and Equipment
  - Compression Moulding and Presses
  - Transfer and Injection Moulding
  - Other Curing Systems including Microwaves and Autoclaves

SESSION 6 - PROCESSING AND MACHINERY (PART II):

- **Rubber Goods Manufacture**
  - Profiles; Hose; Sheet, Shoes, Wire & Cable
  - Roll Covering, Gaskets, Conveyor Belts, Transmission Belts, Balls, Seals & O-Rings
  - Noise/Vibration & Shock Absorbers, Hot Water Bottles, Marine Fenders
  - Expansion Joints, Tracks & Membranes etc.
  - Rubber Compound Formulations

SESSION 7 - PROCESSING AND MACHINERY (PART III):

- **Tyres & Tubes**
  - History
  - Tyre Parts and Anatomy - Tyre Markings
  - Tyre Types
  - Tyre Building
  - Curing, Curing Presses & Moulds
  - Inner Tubes
  - Tyre Testing
  - Developments - Future – Tweel?
  - Retreading

Course Outline *... cont*

SESSION 8 - TESTING AND PROPERTIES:

- Properties of Rubbers
- Testing Raw Rubber & Compounds
- Test Compound Formulations
- Testing Vulcanized Rubber
- Testing Standards

SESSION 8 - LATEX TECHNOLOGY:

- Latex Types
- Manufacture of Natural Rubber Latices
- Manufacture of Synthetic Rubber Latices
- Basic Compounding (Ingredients exclusive to Latex Compounding)
- Products/Processes:
  - Latex Foam; Dipping; Paper Coating; Carpet Backing; Adhesives
- Latex Testing
- Testing Standards

DISCUSSION & OPEN QUESTION SESSION

Course Details & Fees:

Date & Time: Thurs & Fri July 22nd & 23rd, 2010
Registration: 8:00am - 9:00am
Course: 9:00am - 5:00pm each day

***Venue*:** Meeting Room 404
Kuala Lumpur Convention Centre, KL City Centre,
50088 Kuala Lumpur, Malaysia
Tel: +603 2333 2888 :: Fax: +603 2333 2800

***Enquiries*:** Dr Philip Adams, Singapore
Tel: +65 6743 6149 :: Fax: +65 6743 6158
e-mail: padams@chatsworth-group.com

***Course Fee*:** S$980.00 includes lunch, refreshments and concise presentation notes.

NB: Previous Courses run by Chatsworth Hall have received full support from the Malaysian HRDB

Registration Form

(Malaysia RT Course 5 – Jul 22nd & 23rd 2010)

Please photocopy if more space required.

Name (s): _____

Name (s): _____

Name (s): _____

Company: _____

Address: _____

_____

Contact person: _____

Tel: _____ Fax: _____ e-mail: _____

For faster response and to reserve your seat, please fax in the form to (+65) 6743-6158 or e-mail to padams@chatsworth-group.com.

***Payment*:** All payments must be received prior to course; otherwise **CH** reserves the right to withdraw registrant. Please send cheques / bank drafts, **payable in Sing$,** to 'Chatsworth Hall Pte Ltd', together with the registration form, at the following address:

Chatsworth Hall Pte Ltd.
Blk. 109, #03-271,
Lengkong Tiga,
Singapore 410109

Alternatively, payment by TT, ***to include all appropriate bank charges***, should be sent direct to:

Development Bank of Singapore,
Parkway Parade Branch
Account Name: Chatsworth Hall Pte Ltd
Account Number : 027-020052-4
Swift Code: DBSSSGSG

***Refund*:** 50% refund will be given if requests for cancellation in writing are received by June 28th. Thereafter, fees paid are not refundable although the person registered can send a substitute. However **CH** must be informed of such substitution by July 12th.

***Cancellation*:** CH reserves the right of cancellation. Full refund will be given to the registrant if the course is cancelled.