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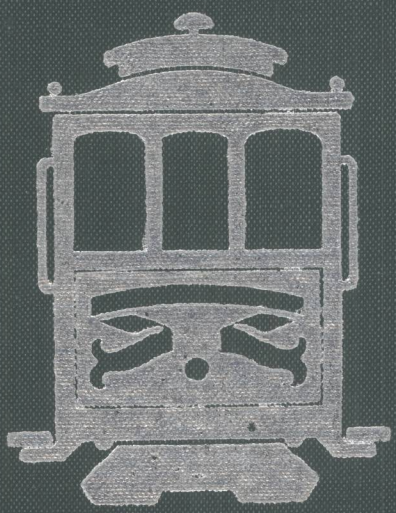

INTERNATIONAL INSTITUTE OF SYNTHETIC RUBBER PRODUCERS

FOURTEENTH ANNUAL MEETING

Hyatt On Union Square

San Francisco, U. S. A.

May 15 - 18, 1973

PROCEEDINGS

INTERNATIONAL INSTITUTE OF

SYNTHETIC RUBBER PRODUCERS, INC.

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INTERNATIONAL INSTITUTE OF SYNTHETIC RUBBER PRODUCERS, INC.

FOURTEENTH ANNUAL MEETING
SAN FRANCISCO, CALIFORNIA

ATTENDANCE LIST

ABSHIRE, A. D.	Manager, Market Research - Polymers Division Shell Chemical Company
*ALCAN, Alain	President Directeur General, SAFIC Alcan & Cie
*AMBLER, M. R.	Development Engineer, The Goodyear Tire and Rubber Company
*ANTON MIRANDA, Emilio	Director General, CALATRAVA Empresa para la Industria Petroquimica S. A.
*AUST, John J.	Customer Service Department, Owens-Illinois Technical Center
AZUMA, Seiji	Manager - Planning and Trade, Synthetic Rubber Division, Asahi Chemical Industry Co., Ltd.
*BARNWELL, W. A., Jr.	General Sales Manager, Petro-Tex Chemical Corp.
*BARRUS, R. J.	Manager, Marketing Services, Ashland Chemical Company
BASS, James	Sales Manager, Thermodynamics Corporation
BAWN, Prof. C. E. H.	University of Liverpool
BEGNAUD, E. M.	Manager, Warehousing & Packaging, B. F. Goodrich Chemical Company
BELL, John T.	Manager, Mechanical Packaging, Container Corporation of America
BENNETT, Donald A.	Managing Director, The International Synthetic Rubber Company, Limited
*BERGEN, William B.	President, North American Rockwell - Aerospace Group
BETZHOLD, Fred C.	Manager, Chemical Materials & Process Development, The Goodyear Tire & Rubber Company
BISHOP, William A.	Director, Research and Development, Copolymer Rubber and Chemical Corporation
*BLAINE, Robert P.	Sr. Product Manager, General Purpose Rubbers, B. F. Goodrich Chemical Company
*BLENCOWE, Dr. J. W.	Project Manager, FAO/UNDP Rubber Development Project, Rubber Research Center
BOHM, Georg	Central Research Laboratories, Firestone Tire and Rubber Company
BORDINAT, E., Jr.	Vice President - Design, Ford Motor Company
*BOTO DANTAS, Romeu	Director Superintendent, Companhia Pernambucana de Borracha Sintetica
*BOWMAN, L. W.	General Manager - Elastomers, ESSOCHEM Europe, Inc.

*** Wives Attending**

BRANDLE, W. J.	Asst. Sales Manager, Corrugated Containers Olinkraft, Inc.
BURNHAM, H.	Manager - Rubber, Resins & Latices Division BP Chemicals International Limited
*CALANCHI, Silvano	Director for Rubber & Polymer Dispersions, ANIC, S. p. A.
*CAPITANI, Dr. Clito	Assistant President, ANIC, S. p. A.
*CARNAHAN, A. Vernon	Donovan Leisure Newton & Irvine
*CAZALET, Peter G.	President, BP North America Inc.
*CHAPERON, Louis C.	President, SOCABU
CHAPPELL, S. F.	Manager, Rubber & Polymer Research, Ashland Oil, Inc.
COLLUMS, Ronald D.	Sales Manager, MacMillan Bloedel Containers Inc.
*COPEMAN, John D.	Publisher, Maclaren & Sons Limited
*COWAN, D. H.	Tech. Service Manager - Ameripol Elastomers B. F. Goodrich Chemical Company
COX. Thomas L.	J & J Manufacturing Company
*CRAIG, Roberto A.	Technical Director, PASA Petroquimica Argentina S. A.
*CUBBAGE, Thomas L.	Phillips Petroleum Company
*DAVIS, Albert J.	Assistant Managing Director, International Institute of Synthetic Rubber Producers, Inc.
*DEL BUE, Annibale	Commercial Manager, ANIC, S. p. A.
DICKERSON, I. C.	Director, Rates and Services, Phillips Petroleum Company
DIENER, Boris	Plant Manager, Australian Synthetic Rubber Company Limited
DIETL, Carlos E.	Chairman and President, PASA Petroquimica Argentina S. A.
DiFEDERICO, Mario A.	Executive Vice President, Firestone Tire and Rubber Company
DRENTHEN, L. L.	Marketing Manager, N. V. Nederlandse Staatsmijnen/DSM
DUDLEY, R. S.	Group Vice President, Polysar Limited
DUNN, John R.	Associate Scientist, Polysar Limited
*EARHART, R. S.	Staff General Manager, The Goodyear Tire and Rubber Company, Chemical Division
*EBERS, Dr. Earle S.	President, UNIROYAL Development Company
EKHOLM, Wesley	Executive Vice President, Cities Service Company
*ELLIOTT, R. E.	Director, Rubber Chemicals Division, Phillips Petroleum Company
ERI, Masayoshi	General Manager, Synthetic Rubber Division Asahi Chemical Industry Company Limited
*ERNST, John L.	Vice President, Elastomers Department, Exxon Chemical Company U. S. A.

FOLT, Vernon L.	Senior Research Associate, B. F. Goodrich Company
FORD, William E.	General Manager, Marketing, Cities Service Company - Columbian Division
FUSCO, J. V.	New Venture Development Division, Manager, Exxon Chemical Company U. S. A.
GAMACHE, R. Donald	President, INNOTECH
*GEISE, Edward J.	Vice President - Marketing, UNIROYAL Chemical Division of UNIROYAL, Inc.
GLASSER, R. L.	Product Manager - Polymers, Petro-Tex Chemical Corporation
GOMEZ, S.	Director of Marketing, PASA Petroquimica Argentina S. A.
*GOODMAN, Harry M.	Distribution Manager, Firestone Synthetic Rubber and Latex Company
GRAULICH, Dr. Wilhelm	Director, Bayer AG
GYENGE, John M.	Technical Manager, Rubber & Resin Products, The General Tire & Rubber Company
HAGLER, Stanford D.	Borger Plant Representative, The General Tire & Rubber Company
HANAOKA, Yaraku	President, Denki Kagaku Kogyo K. K.
HANDA, Seizo	General Sales Manager, Japan Synthetic Rubber Company Limited
HANMER, Robert S.	Phillips Petroleum Company Europe-Africa
HARRINGTON, Charles J.	Vice President & General Manager, E. I. du Pont de Nemours & Company, Inc.
HARRIS, J. William	Manager, Public Relations, Ford Motor Company - Design Center
*HATFIELD, A. L.	Administrative Director - International B. F. Goodrich Chemical Company
*HAZLEWOOD, Maurice	Shell International Chemical Company Limited
HERRINGER, Frank C.	Administrator, Urban Mass Transportation Administration, Dept. of Transportation
HOFMANN, Dr. Werner	Manager, Rubber Division, Public Relations, Literature and Toxicology, Bayer AG
HOLLEY, Monroe	Sales Manager, T. R. Miller Mill Co., Inc.
*HOLMES, David W.	Director of Sales, E. I. du Pont de Nemours and Company, Inc., Elastomer Chemicals Dept.
*HOLZRICHTER, Dr. H.	Member of the Managing Board, Bayer AG
HORNSBY, Harry J.	Commercial Director, International Synthetic Rubber Company Limited
*HOWD, George T.	Manager, Elastomers Division, Shell International Chemical Company Limited
HUBENTHAL, Harry	Sales Representative, Corrugated Containers Olinkraft, Inc.

*HUNTER, George W.	Vice President, Exxon Chemical Co. U.S.A.
HUTCHISON, B. G.	Vice President, Marketing, Copolymer Rubber and Chemical Corporation
*HUXLEY, C. E.	Manager, Marketing Services, Exxon Chemical Company U. S. A.
*JOHNSTONE, Leo H.	Vice President, Phillips Petroleum Company
KAGAWA, Noriyasu	Representative, Sumitomo Chemical, N. Y.
KANEKO, K.	General Manager, Planning Department Denki Kagaku Kogyo K. K.
KATSUMOTO, Shinnosuki	Vice President, Japan Synthetic Rubber Company Limited
*KEELER, William W.	Member of the Board, Phillips Petroleum Co.
*KELLY, Joseph R.	Marketing Manager, Rubber and Rubber Chemicals Dept., The Goodyear Tire and Rubber Company
*KEMPER, William E., Jr.	Sales Manager, Owens-Illinois, Inc., Forest Products Division
KIEPERT, Dr. Klaus M.	Head Technical Service Department Chemische Werke Huels AG
KILACHAND, Tulsidas	Chairman, Synthetics & Chemicals Limited
KINZIE, William	President, Thermodynamics Corporation
KITAJIMA, Kozo	Manager, Secretary's, Showa Neoprene K. K.
*KITTRELL, Charles M.	Sr. V. P. & Director of Phillips International, Phillips Petroleum Company
KIYOHARA, Yooichi	Managing Director, Nippon Zeon Company Limited
KOENIG, Prof. Jack L.	Case Western Reserve University
KOGA, Shuji	Chairman of the Board of Directors, Nippon Zeon Company Limited
KOMURO, Keiji	Manager of Rubber Dept., R & D Center Nippon Zeon Company Limited
*KROL, L. H.	Director Elastomers Research, Koninklijke Shell Plastics Lab.
KRONLINS, Gunnar	Phillips Petroleum Company Europe-Africa
*LAMBERSON, Ralph	Managing Director, The International Institute of Synthetic Rubber Producers, Inc.
LATIMORE, E. S.	Public Relations Representative, E. I. du Pont de Nemours & Co., Inc., Elastomer Chemicals Dept.
LEONARD, Milton H.	Vice President - Columbian Division, Cities Service Company
*LERNER, Mel	Publisher, Rubber Age
*LIMA CAMARA, Paulo P.	General Manager, Petrobras Quimica S. A. - PETROQUISA
*LOCKWOOD, James P.	President, Petro-Tex Chemical Corporation

*LOPES SOLIS, Rafael	Sales Manager, NEGROMEX, S. A.
*LO SCALZO, Dr. Enzo	Societa' Italaiana Resine
*LOUIS, Victor	Director, Chemische Werke Huels AG
LUYTEN, Paul	NV PETROCHIM S. A.
McCLEARY, Charles D.	Director, Research and Development, Chemical Division, UNIROYAL, Inc.
McKAY, Chester E.	Chairman of the Board and President Copolymer Rubber and Chemical Corp.
MANNING, Dean R.	Unit Supervisor, Columbian Division Cities Service Company
MARA, James	President, Firestone Coated Fabrics Company
MATSUDA, Toshio	Managing Director, Kuraray Company Limited
MATSUO, Dr. Masato	Manager, Nippon Zeon Company Limited
MEYERHEIM, Wilhelm	Managing Director, Bayer AG
*MILLER, J. E.	Vice President, B. F. Goodrich Chemical Co.
MILLER, Robert G.	Manager Coordinating & Planning, Exxon Chemical Company U. S. A.
MIYAKODA, Hiroshi	Vice President, JSR America, Inc.
MUSKOPF, Bill	Field Sales Manager, Crown Zellerbach Corp.
*MYERS, James A.	Senior Vice President, Ashland Chemical Co.
*NESBITT, Ray B.	Vice President - Polymers, ESSOCHEM Europe, Inc.
NINOMIYA, Kazuhiko	Manager, Research and Development, Japan Synthetic Rubber Company Limited
NOMIYAMA, Yas	West Coast Technical Service Representative, St. Regis Paper Company
OGAWA, Tetsuo	President, Showa Neoprene K. K.
OGLE, Paul E.	President, O-T-D Corporation
OKABAYASHI, Tsugio	Executive Vice President, Kuraray Co., Ltd.
OOHARA, Ken-Ichiro	Senior Economist to Vice President, Kuraray Company Limited
OSBORNE, E. B.	Vice President - Marketing, B. F. Goodrich Chemical Company
PALEOLOGO, T.	Vice Director, Societa' Italaian Resine
PAWLAK, R. J.	Development Engineer - Chemical Division, The Goodyear Tire & Rubber Company
PERDUYN, John P.	Public Relations Representative, The Goodyear Tire & Rubber Company
*PETERSEN, Peter	Chemische Werke Huels AG
*PHILLIPS, C. W. Lonnie	Manager, International Department, Phillips Petroleum Company
PORTMANN, Dale A.	Sales Manager, Continental Box Company Division General Box Company

PRESNELL, J. H.	Phillips Petroleum Company
PURSELL, W. A.	Director of Sales, North and South America Polysar Limited
REDLICH, G.	Director General, Hules Mexicanos S. A.
*RHOAD, M. J.	General Manager - Chemical Division, The Goodyear Tire & Rubber Company
*RHODES, R. G.	Phillips Petroleum Company
RILEY, Richard A.	President, The Firestone Tire & Rubber Co.
*ROBERTS, N. B.	General Manager, Polysar International S. A.
ROBITAILLE, Ralph B.	Phillips Petroleum Company
*RODRIGUEZ LARRETA, H.	External Relations Manager, PASA Petroquimica Argentina S. A.
*ROH, Manfred	Sales Manager - Rubber, Chemische Werke Huels AG
*ROSAHL, Dr. Dietrich	Director, Bayer AG
ROSS, Jack	The Bank Of America
RUEBENSAAL, Clayton	Director - Corporate Planning, UNIROYAL, Inc.
RUTHERFORD, Alastair	Manager - Market Analysis, E. I. du Pont de Nemours & Co., Inc., Elastomer Chemicals Dept.
SALISBURY, Thomas E.	President, Firestone Synthetic Rubber and Latex Company
SAMPAYO, L. G. N.	Director of Administration, PASA Petroquimica Argentina S. A.
SAMUELS, Martin E.	Manager - Technical Service, Copolymer Rubber and Chemical Corporation
SANADA, Toyoaki	Manager, Commercial Development Department - Rubber Division, Sumitomo Chemical Co., Ltd.
SCABELL, Dieter	Director, Bayer AG
SCHMALENBACH, Dr. K.	Bayer AG
*SCHROEDER, Herman E.	Director of Research & Development, E. I. du Pont de Nemours & Co., Inc., Elastomer Chemicals Dept.
SCHUCK, Hugh J.	Public Relations Director, International Institute of Synthetic Rubber Producers, Inc.
SCOTT, Charles E.	Asst. Director Research, Columbian Division, Cities Service Company
SEKHAR, Dr. B. C.	Director, Rubber Research Institute of Malaya
SEMEGEN, Stephen T.	President, Natural Rubber Bureau
SHIMAMURA, Michiyasu	President, Nippon Zeon Company Limited
SHIMURA, Bunichiro	Manager, New York Office, Denki Kagaku Kogyo K. K.
SHIRAO, Tetsuro	Manager of Overseas Department, Nippon Zeon Company Limited
*SIEVERS, Robert J.	Marketing Manager, E. I. du Pont de Nemours and Company, Inc., Elastomer Chemicals Dept.
SOMMER, E. C.	Manager Technical Service, Phillips Petroleum Company

SORKIN, Martin E.	Dow Corning Corporation
*SOUSA, Luiz Mario F.	Industrial Director Assistant, Petrobras Quimica S. A. - PETROQUISA
*STEVENSON, A. C.	Assistant to Director of Sales, E. I. du Pont de Nemours & Co., Inc., Elastomer Chemicals Dept.
*STIPAK, John A.	Market Analyst - Columbian Division Cities Service Company
STRICKLAND, John R.	Director, Chemical Information Services Stanford Research Institute
SUTPHIN, R. L.	Staff Representative, Elastomers Department Exxon Chemical Company U. S. A.
SWANEY, Miller E.	Senior Product Executive, Exxon Chemical Company U. S. A.
TADA, Koichi	Toyo Rubber Industry Company Limited
TEAT, M. S.	Profit Improvement Consultant, Phillips Petroleum Company
THOMPSON, Jack	The Bank of America
*THOMSON, W. C.	Director, Shell International Chemical Co., Ltd.
TOKITA, Dr. Noboru	Research Associate, UNIROYAL, Inc.
TORRERO, Jose	Marketing Manager, Hules Mexicanos S. A.
VAN VLIERDEN, C. M.	Executive Vice President, International Banking, The Bank of America
*VERMORKEN, A. M.	Managing Director, Chemische Industrie AKU-Goodrich B. V.
VITTONE, A.	President, B. F. Goodrich Chemical Company
WALKER, Richard S.	Vice President and Editorial Director, Rubber World
*WALTERS, Peter I.	Managing Director, The British Petroleum Co., Ltd.
WAY, W. E.	Coordinator of Packaging, Ashland Chemical Company
*WIDMER, Dr. Hans	Manager, European Chemical Technical Center Compagnie Francaise Goodyear
WILDE, A. R. D.	Head of General Purpose Rubbers, Shell International Chemical Company Limited
WILLIAMS, Lucian C.	Sales Manager, St. Joe Paper Company
*WORKMAN, Robert E.	Director Chemical/Plastics Operations - Chemical Division, The Goodyear Tire and Rubber Company
WUEST, H. T.	Phillips Petroleum Company
YOUNG, Ralph	The Bank of America
*ZEDDE, Guy Y.	Manager, GMMC, Compagnie Francaise Goodyear
*ZIMMER, John C.	Marketing Manager, Compagnie Francaise Goodyear

MATERIALS HANDLING IN NORTH AMERICA

PAST, PRESENT, AND FUTURE

E. M. BEGNAUD

MANAGER - WAREHOUSING, PACKAGING & MATERIALS HANDLING
B.F.GOODRICH CHEMICAL CO.

H. M. GOODMAN

DISTRIBUTION MANAGER
FIRESTONE SYNTHETIC RUBBER AND LATEX CO.

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Packaging engineers, transportation specialists, and others in the synthetic rubber industry involved with the distribution of our products agree--there will be better ways of handling these materials than the methods being used in 1973. The ideal condition would be realized if the bales of rubber had wings and could fly from the outlet of the baler to the point of consumption and all costs of packaging and handling between the two points could be eliminated. Unfortunately, the bales must be moved by more common methods which create some rather formidable challenges.

The challenges of this problem came into being with the startup of the first big synthetic rubber plant in 1942 and have changed little in the intervening years. All of the improvements made during these years have only shifted the challenges to new techniques and there are no final answers, only stages of progress. Among these challenges are:

1. Cost of packaging.
2. Difficulties in filling at our producing plants.
3. Lack of adequate product protection by existing package.
4. Difficulty in handling enroute to the customer.
5. Separation of packages from the product is sometimes difficult.
6. Disposal of packaging materials which are costly and result in ecology problems.

For the first several years, these challenges were aimed at the three-ply, clay coated bag which was essentially the only package. The cost of the bag was acceptable, but the handling costs were extreme. The bag was opened by hand and a scoop of talc was poured in. The already dusted bale was dropped in; another scoop of talc was added; the sewing machine closed it. The bale was manually moved at least four times and as many as ten times before final use. It was palletized in the production area and moved to storage. It was moved to a rail car where it was depalletized, and stacked in the car. At destination, it was repalletized and moved to storage. It was finally moved again to an unpackaging and point of use area.

In addition to the high cost of multiple handling, rubber packaged in clay coated bags had a very short shelf life. The rubber would absorb the talc, absorb the clay, and firmly adhere itself to the paper bag. Rubber warehoused only a few months would exhibit extreme paper-to-rubber adhesion by the time it reached the consuming plant.

Rather novel ways were devised for paper removal. The two most popular were:

1. Soaking in water tanks, then wire brushing, and

2. Burning the paper off with blow torches.

All too often, bales went into the mix with paper still on them. A large portion of defective products resulted.

In the early 1950's the urgency of solving the problem of paper contamination and management displeasure, with the high cost of paper removal, led compounders to carry out the tests which proved that a thin polyethylene film wrap was miscible with rubber at Banbury temperature without deleterious effect. A new day dawned. The birth of the first bulk package was possible.

The first bulk type boxes were made of corrugated fiberboard and were produced by Gaylord Container Corporation, now a division of Crown-Zellerbach. The basic cost of this package was about the same as that for the bags it replaced, but the difference in handling costs was substantial. The package held about 2,500 pounds (1134 kilos) of product. Individual rubber bales were handled only in loading into and unloading from the container.

Of course the "Gaylord" was not without "challenge". A new problem, bale-to-bale adhesion, came into being. The unit did round out, rubber did flow, and broken film did expose bare rubber to paper and to the adjacent bales. These problems were small compared to the old one of bag adhesion.

The original "Gaylord" was a four-piece unit, consisting of a tray and three sleeves. The problem of assembly and component inventory soon brought about modifications leading to the two-piece unit, consisting of a half-slotted container and an outer sleeve. Olinkraft, Inc. did the primary development of the two-piece container, although others were also involved.

While the name "Gaylord" became a generic term for a corrugated unit and was understood to be a standard package, actually every synthetic rubber producer had his variation, and it was soon purchased from several suppliers. Even today, however, only a few suppliers of corrugated material have demonstrated their ability to produce an acceptable rubber box.

The development of a bale wrapping machine for applying polyethylene film was coincidental with, and necessary for, the advent of the "Gaylord". The first crude and troublesome machines were large modifications of bread wrappers. They operated from one roll of film, turned the bale to wrap it, and generally gave poor seals which were made

by pressing the folded layers of film against the bale with a heated sealing bar. The modern straight through machine, which utilizes two rolls of film, creates a well sealed, loose envelope around the bale. The most widely used type was developed by J & J Manufacturing Co. and Texas-U.S. Chemical Co. in about 1959.

Another development, simultaneous with the "Gaylord," which did not proceed beyond the major test stage was the paper wrap machine. The adoption of the "Gaylord" halted this project, in which a film wrap machine and a paper wrapping machine were operated in series. It essentially was an improved bag which could be applied automatically.

In the mid 1950's, the triple cell corrugated container was developed. It was designed to be stackable and was intended for use in export shipments. It was not widely accepted for export. It was stackable in warehouses, though not in rail transit. It became popular with customers having limited storage space.

The first trials of returnable containers were made in 1953 and 1954 at the Copolymer Rubber & Chemical Corp. plant in Baton Rouge, Louisiana and the Firestone Synthetic Rubber & Latex Co. plant in Lake Charles, Louisiana. These collapsible steel containers were made of light gauge metal so as to minimize tare weight and return freight. After a few trips they were so distorted that assembly became too difficult and the project was halted.

The first successful returnable container developed was the Shell Chemical Co. "Flotainer." It was simply a wooden crate, steel strapped around forty-two bales of rubber. The bales were stacked on a pallet six to a layer, seven layers high. This had been the standard pattern for bagged rubber. The "Flotainer" was very successful on the West Coast of the United States for short shipment on flatbed trucks which could load and unload from the side. It did not, however, fit very well into rail cars or van type trucks.

The only real improvement in the late 1950's was the wide utilization of silicone (in particular Dow Corning's Syl-Off 22) and similar release agents. Cured silicones almost eliminated paper adhesion. These materials are used on the inner surfaces of corrugated boxes and paper bags. The leader in the application of silicone to corrugated board was St. Joe Paper Co. It was soon learned that the best release coating was a paper surface coated with a thin layer of polyethylene before the silicone was applied. The polyethylene functions as a sealer or sizing to the paper. This type of application can be used only on bags.

Due to the extreme cold flow characteristics of butyl rubber, special packages were devised. Butyl was packaged in metal cans and very heavily constructed corrugated, single bale boxes. Wooden crates have also been popular butyl containers. A very heavy six tube, double tiered unit was developed in the late 1950's, and modified versions are still the standard package.