

International Naval Stores Conference highlights developments, demand forecasts in forest chemicals industry

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The 19th International Naval Stores Conference, sponsored by the Pulp Chemicals Association, was held Oct. 11–14, 1992, at the Hotel Inter-Continental Wien in Vienna, Austria. The conference drew 190 attendees representing 25 countries. Papers were presented by: Rauno Luttinen, R&D manager, Veitsiluoto Oy, Forest Chemicals Industry, Finland; Mack Harashima, president, Arakawa Chemical (USA) Inc.; Sean G. Traynor, vice president sales and marketing, SCM Glidco Organics; Roy Lofthouse, Union Camp Chemicals (UK) Ltd.; M. S. Etzel, Russian general officer for pulp, paper, and forest chemicals; Irving Kaye, vice president technical–European operations, National Starch and Chemical Ltd.; D. F. Stauffer, International Development Associates, Inc.; Peng Wenghuan and Ming Qing, China Tuhsu Forest Chemical Products Import-Export Corp.; and James Russell, consultant.

Turpentine-derived products

Around the world, turpentine-derived products are becoming increasingly popular, according to Luttinen. The reasons are that turpentine is a naturally occurring, renewable raw material; it contains fractions that are precursors to a large and versatile product family; and the availability of crude sulfate turpentine is much improved due to improved recovery within pulp mills. Furthermore, better use and recovery of by-products is a consequence of increasingly stringent environmental regulations.

In his presentation, "Turpentine distillation and upgrading in Europe," Luttinen discussed the two crude turpentine fractionators in Europe—DRT in Dax Cedex, France, and Veitsiluoto Oy in Oulu, Finland—that use crude sulfate turpentine and gum turpentine as raw materials and have a total capacity of about 50,000 metric tons/year. Basic fractions separated during distillation processes at these facilities are *alpha*-pinene, *beta*-pinene, *delta*-3-carene, dipentenes, and, as a residue of distillation, a mixture of terpene alcohols and sesquiterpenes. After fractionation, these terpene monomers can be further upgraded to give aroma chemicals and intermediates, disinfectants, ore flotation chemicals, terpene resins, industrial cleaners, solvents, and chemical intermediates.

In a presentation entitled "Turpentine from sailing ships to the ozone hole," Traynor gave an overview of turpentine from the time of the Greeks, Romans, and Persians who recognized its

medicinal and solvent value to the present, when terpenes are promising replacements for ozone-depleting solvents used in many cleaning applications. Traynor discussed the types of turpentine, covering the uses, development, and demand trends of each.

The long-term outlook for terpene derivatives is very encouraging, Traynor noted. The outlook will be largely dictated by the cost of competing technologies, the value added by the derivatives made from crude sulfate turpentine, and the availability of turpentine.

Tall oil fatty acids and rosin

The European markets for tall oil fatty acid and rosin was the subject of Lofthouse's presentation. There are few, if any, applications where tall oil fatty acids cannot be replaced by other fatty acids, Lofthouse noted. However, there are many industrial applications where tall oil fatty acids cannot be used. As a result, "the volume, price, and demand of tall oil fatty acid is directly influenced by factors outside the control of the producer," Lofthouse said. "... The market for tall oil fatty acid in Europe is a very elastic one and potentially much larger than the currently available production capacity."

Regarding the European market for rosin, Lofthouse noted that the quality issues which formerly differentiated gum and tall oil have largely been overcome or accepted as noncritical. Gum rosin remains dominant in printing inks, whereas tall oil rosin has replaced gum as the dominant factor in adhesives. Overall, "the future balance of tall oil vs. gum rosin is going to be largely decided on price," Lofthouse said. "... The extreme versatility of rosin as a raw material and its renewable resource base, however, ensure that it will continue to play a very large part in the European inks, paper, and adhesives industry for the foreseeable future."

Harashima's presentation, "Rosins vs. hydrocarbon resins: forecasting supply, demand, and growth in the United States," touched on the uses of hydrocarbon resins, the largest of which is adhesives. In the United States, hydrocarbon resins and rosin-based resins coexist in the adhesives and printing ink markets, Harashima said. The next few years are expected to bring changes as the demand for resins continues to grow at about 6% per year. Hydrocarbon sources of raw materials, especially petroleum-

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based sources, are expected to be prominent factors in satisfying the demand, Harashima said, because not enough rosin will be available. "By the end of the decade, good quality tall oil rosin will be used primarily in high-performance, high-profit specialty products, and hydrocarbon resins will have taken over the higher volume commodity markets," Harashima predicted.

Forest chemicals in the Russian Federation

The forest chemicals industry in the Russian Federation has been affected less than other industries during the period of change to a market-driven economy, said Etzel. Even so, production rates of its major materials are down 20–30% from 1989 levels. Etzel gave an overview of activity in four main forest chemical areas: rosin and turpentine from gum, wood, and sulfate sources; charcoal and allied products; materials from sulfite pulp processing; and bark and leaf derivatives.

Regarding the status of the industry, Etzel's remarks pointed to a number of favorable factors the Federation possesses. Many of the plants in Russia are well-situated to service the Asia-Pacific market. Although much of the existing technology needs modernizing, the Federation has a number of excellent R&D institutes staffed by world-class scientists. The area has enormous renewable, and in some cases, untapped forest resources. And the Federation has a flexible policy toward cooperation with foreign investors, ranging from total ownership to barter and compensation arrangements.

Rosin tackifiers for adhesives

Kaye's presentation focused on rosin-based tackifiers for adhesives, which compete directly with hydrocarbon-based tackifiers in most markets. He discussed the advantages and disadvantages of rosin tackifiers vs. hydrocarbon tackifiers and gave an overview of the European market for the materials.

The Western European market for tackifying resins for adhesives is approximately 150,000 metric tons, with an annual growth rate of 4–5% for the period 1990–95, Kaye said. There are three major markets for these adhesives. Construction adhesives is not seen as a growth area for tackifiers, due to a general construction slowdown in much of Western European countries and to a technology shift from solvent-based rubber-resin adhesives to alternate chemistries such as 100% solids polyurethanes. Packaging, paper converting, and nonwovens is a large market for adhesives and tackifiers, with a projected growth rate of 3–4%. Pressure-sensitive adhesives for tapes and labels may be the largest single market for tackifiers, with growth expected in the 5–6% range.

The Asia Pacific region and China

Rosin markets in the Asia Pacific region were discussed in a presentation by Stauffer. He noted that 25 years ago, markets for naval stores products, with the exception of Japan, were insignificant and largely ignored by major producers. In 1991, however, the Asia Pacific region purchased more than US\$ 41 million of naval stores products from the United States, or nearly 31% of

the total. Japan accounts for nearly 60% of exports to the region and more than 18% of the global total, but consumption in other countries in the region is significant. The region consumes 41% of crude tall oil or distilled tall oil, 38% of rosins, 27% of miscellaneous rosin derivatives, 16% of rosin salts and esters, 32% of turpentine, and 11% of other terpene hydrocarbon exports, Stauffer noted.

Peng Wenghuan and Ming Qing discussed the naval stores business in the People's Republic of China, noting that over the past 10 years the annual output of Chinese gum rosin has consistently been about 400,000 metric tons. Producers have been working to raise the quality of gum rosin products in accordance with the export strategy of the "7th Five-year Plan" and international market requirements, they noted. "We are very proud of the great contribution that Chinese gum rosin has made to the world economy. Now our export policy is to maintain quality and keep supply steady."

Committee activity

Russell provided an update on the Pulp Chemical Association's TSCA Committee activity. He described how the committee has worked with the U.S. Environmental Protection Agency to remove all listings of tall oil rosin and its derivatives from the Toxic Substances Control Act (TSCA) Inventory of Chemical Substances. Two listings describing tall oil rosin had been included in the inventory. The duplicate listing posed two problems: rosin derivatives manufactured in the United States were not in the inventory, and it became confusing for suppliers to get new products included in the TSCA Inventory due to the assignment of different Chemical Abstract Service Registry Numbers for the same chemical.

The committee is currently working on a regulatory problem involving distilled tall oil and will address another multiple listing problem, dimer acid.

The 1993 International Naval Stores Conference is scheduled for September 12–15 at the Marriott World Center in Orlando, FL. For more information, contact the Pulp Chemicals Association, P.O. Box 105113, Atlanta, GA 30348, telephone: (404) 446-1290. **T**