

TIE LAYER RESINS 1997-2002

CHEMICAL MARKET RESOURCES, INC. POLYOLEFINS - MARKETS, TECHNOLOGIES & TRENDS SERIES

INTRODUCTION

The total demand for tie layer resins in North America was 84 million pounds in 1997. The demand for tie layer resins is projected to grow at the rate of 4.8% annually for the next five years. The total demand for tie layer resins in Western Europe was about 35 million pounds in 1997, and it is projected to grow at 4.4% annually for the next five years. The total demand for tie layer resins in Japan was 25 million pounds in 1997, and it is projected to grow at 2.5% per year for the next five years.

Tie layer resins, commonly referred to acid or anhydride modified polyolefin resins, are largely used in multilayered packaging structures to bond two dissimilar substrates. Tie layer resins face virtually no competition from other materials except in some low-end markets where they face competition from high EVA copolymers. Tie layer resins offer excellent bonding properties when coextruded with barrier resins such as EVOH and nylon. Tie layer resins are extensively used in flexible and rigid packaging applications such as cheese and meat packaging films, HDPE coextruded films, multilayer bottles, barrier sheets and others. Advanced Ziegler-Natta and metallocene catalyzed polyolefins are currently being evaluated by major tie layer resin suppliers. Tie layer resin suppliers believe that tie layer resins manufactured by grafting anhydrides and acids onto metallocene catalyzed resins will result in resins having sharper melting points, better bond strength, puncture resistance and clarity.

BENCHMARK MARKET STUDY

To assist companies in developing an in-depth analysis of the current market status and monitoring rapid developments, Chemical Market Resources, Inc. (CMR), with our extensive experience in tie layer resin markets, presents a comprehensive business/technical strategic analysis that reports in-depth on the intermaterial competition of these products/markets. The report will assess the opportunities and the strategies for developing these markets.

THE MAJOR OBJECTIVES

Assist polyolefin producers in effectively positioning their resins for the tie layer resin market

Evaluate and quantify the impact of metallocenes and other "New Generation" polyolefins on global tie layer resin markets

Assist tie layer resin producers and film converters in assessing market trends and intermaterial competition

Assist major end users in selecting the appropriate type of the tie layer resin and understanding manufacturing cost economics



KEY ISSUES ADDRESSED

Outline of the global tie layer resin markets

In-depth opportunity analysis for mergers and acquisitions in the North American marketplace

Current & future technologies for tie layer resin manufacturing cost

Market/technology positioning of major tie layer resin producers

End use requirements for polyolefin resins and unmet needs of major tie layer resin producers

Impact of new generation polyolefins on tie layer resin markets

Detailed manufacturing cost analysis for tie layer resins

APPROACH

The information, data and conclusions of this analysis were developed from sources in North America, Western Europe and Japan, and are based upon, but not limited to, the following methods:

Search, review and interpretation of information from government sources, trade and industry groups, published articles and product promotional information

A thorough search of relevant patent technology and process details from producers

Information from industry experts and CMR proprietary projects related to tie layer resins

Interviews with leading suppliers of polyolefin and tie layer resins, film converters, major end users in each market segment

Other multiclient studies completed by Chemical Market Resources, Inc.

The manufacturing cost economics based on our extensive cost databases and interviews.

The intermaterial competition was analyzed based on "indifference analysis", a technique used by Chemical Market Resources, Inc. and well accepted by our major clients.



PROJECT MANAGEMENT TEAM

Dr. BALAJI B. SINGH, president of Chemical Market Resources, Inc., obtained his Ph.D. in Chemical Engineering from Texas A&M University and an M.B.A in Marketing Research and Strategic Planning from the Ohio State University. He has seven years of experience in the oil/chemical industry in process research, process economics and marketing research. His key area of expertise is in opportunity evaluation and competitive assessment for technology value added specialty products in petrochemicals and functional chemicals. Balaji has successfully completed over 500 proprietary studies, in high technology specialty products in various end use industry sectors for clients worldwide.

TIMING, SUBSCRIPTION & ORDERING INFORMATION

This study was completed in June, 1998. The price of the study is 5,000 for two copies of the report. Additional copies are available for \$200 each. To subscribe, simply sign the attached order form and mail/fax to us. The study can be ordered as a part of the Chemical Market Resources, Inc., Polyolefins MT&T series. For further information call (281) 557-3320 and ask for Dr. Balaji Singh.



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

TIE LAYER RESINS 1997-2002

**North America, Europe and Japan
POLYOLEFINS - MARKETS, TECHNOLOGIES & TRENDS SERIES**

REPORT NUMBER 226

ORDER FORM

Mail order form/payment to:
Chemical Market Resources, Inc.
560 Blossom Street, Suite C
Houston, TX 77058-3320

Telephone Inquiries: 281-333-3313
Fax Inquiries: 281-333-3361

Wiring Instructions:
Horizon Capital Bank:
P.O. Box 557730 Webster, TX 77598
ADA No: 113023945 Acct: 78581

The report was issued in June 1998. Subscribers are entitled to purchase the study for the price of U.S. \$5,000.00 for two copies of the study. Subscribers will be invoiced for the full amount upon order placement. Additional copies are available at \$200 each. Substantial discounts are available if the report is ordered as a part of the MT&T series.

Subscribers agree to treat the contents of this report as confidential, not to be revealed to any person outside the subscriber organization, and to certify the report will be used solely by the officers and employees of the subscriber or majority owned subsidiaries (>51%).

.....
Authorized Signature Date

.....
Company Name Name/Designation

.....
Street Address

.....
City State Zip

.....
Telephone/Fax Numbers

If you are ordering extra copies, please include the addresses where the copies are to be mailed (on an additional piece of paper), if different from your own.



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

ABOUT OUR COMPANY...

CHEMICAL MARKET RESOURCES, Inc. was founded in 1990 to focus in the areas of marketing research and strategic planning. Our global clientele is concentrated within the chemical, petrochemical, plastics and related industries.

Prior to joining CMR, Inc. our associates held responsible positions in chemical and allied industries. Our team of professionals has strong technical backgrounds combined with hands-on business experience. Compilation of data, strategic analyses, writing and editing are entirely conducted in our state of the art facilities in-house to assure quality control at each stage of development. Our strength is in closely interacting with our clients to maximize effectiveness. We provide in-depth analyses with actionable statements in a cost-effective and timely fashion.

We are Committed to Polyolefins!

Multiclient Studies

New generation Polyolefins vs. SB Copolymers - North America, Europe and Japan 1995-2000 - Markets, Technologies & Trends - Completed January 1995
Intermaterial Competition of fPVC, Flexible Range TPEs and EP(D)M vs. Polyolefins North America, Europe & Japan 1995-2005 - Completed January 1996
High EVA Copolymers - North America, Europe and Japan 1996-2001 - Markets, Technologies & Trends - Completed June 1997
Polypropylene Films - North America, Europe and Japan 1996-2001 – Markets Technologies & Trends - Completed December 1996

Periodicals

New Generation Polyolefins - Bimonthly Global Review of Technologies & Trends. On-going service, published six times a year - Call for a complimentary copy!

Proprietary Studies

We have positioned numerous polyolefin products in the markets in North America, Europe and Japan. We have conducted studies for most of the major polyolefin suppliers and end users - Call us for a list of proprietary studies.

Conferences

We conduct a highly successful Annual Conference – FlexPo- which covers Intermaterial competition among flexible polymers including fPVC, polyolefins, TPEs and rubbers. Our recently concluded FlexPo'98 conference held between June 24-26, at the JW Marriott, in Houston, TX, focused on PVC replacement opportunities.



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

RELATED PUBLICATIONS

Tie Layer Resins is the fourth installment in our continuing series Markets, Technologies & Trends, or ***MT&T***. The first three studies in the series are ***Polypropylene Films, High EVA Copolymers*** and ***Polyolefin Foams***.

Polypropylene Films was published in **November, 1996**. Using the same approach as the Polyolefins Foams study, this volume addressed the following key issues:

- Outline of the global oriented polypropylene (OPP) and unoriented polypropylene (UOPP) markets
- In-depth opportunity analysis for mergers and acquisitions in the North American marketplace
- Current and future technologies for OPP/UOPP film manufacturing processes and costs
- Market/technology positioning of major OPP/UOPP film producers
- PP resin and end use requirements plus unmet needs of the major film producers
- Impact of new generation polyolefins on OPP/UOPP markets
- Impact of syndiotactic PP on OPP/BOPP markets
- Detailed manufacturing cost analysis for film and converting to end use structures

SUBSCRIPTION INFORMATION

The price for this study is \$5,500 for two copies. Additional copies are available for \$200 each. An order form is included on the last page of this prospectus.

High EVA Copolymers was published in **June, 1997**. The key issues addressed in this volume include

- Outline of the North American, European and Japanese high EVA copolymers market trends and forecasts
- Unmet needs translatable into opportunities
- Developments in metallocene LDPE/LLDPE grades positioned to compete against high EVAs
- Analysis of the major high EVA copolymers and new generation polyolefins suppliers and their strategies in these markets/applications



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

RELATED PUBLICATIONS (Cont'd)

Market and technology positioning of major high EVA copolymer producers
End use profitability and manufacturing costs
Detailed manufacturing cost analysis for high EVA copolymers

SUBSCRIPTION INFORMATION

The price for this study is \$5,000 for two copies. Additional copies are available for \$200 each. An order form is included on the last page of this prospectus.

Polyolefin Foams was published in November, 1997. The key issues addressed in this volume include

Outline of the North American, European and Japanese Polyolefin Foam markets, trends and forecasts
Unmet needs translatable into opportunities
Developments in metallocene LLDPE grades for use in foam applications
Analysis of the major polyolefin foam and new generation polyolefins suppliers and their strategies in these markets/applications
Market and technology positioning of major polyolefin foam suppliers
End use profitability and manufacturing costs
Detailed manufacturing cost analysis for polyolefin foams

SUBSCRIPTION INFORMATION

The price for this study is \$6,500 for two copies. Additional copies are available for \$200 each. An order form is included on the last page of this prospectus.

Chemical Market Resources, Inc., recognizes the urgent demand in the polymer community for a reliable, high-quality publication published periodically that provides in-depth technology assessments as well as market/trend analysis.

NEW GENERATION POLYOLEFINS *A Bimonthly Global Review of Technologies & End Use Trends* is the news report we specifically developed to meet this need. Every two months we publish an issue which provides

An in-depth review of major issues related to new generation polyolefins, both metallocene and nonmetallocene, in North America, Western Europe, Asia and South America



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

RELATED PUBLICATIONS (Cont'd)

SUBSCRIPTION INFORMATION

A systematic update and analysis of each technology in terms of concept, process, product properties and processing with comparisons among competing technologies made whenever appropriate

A quantitative analysis of markets and trends for key products produced by these technologies with comparisons made among products from competing technologies made whenever possible or appropriate

Comments and updates on key events regarding these new generation polyolefins

SUBSCRIPTION INFORMATION

The first issue of **NGP** appeared in August, 1995. Subscribers can purchase a one-year subscription (six issues) for the price of \$18,000 for two years.

Additional copies are available at \$600 per set of six issues. Past issues are available for \$1,000 per issue plus \$50 for each additional copy.

An order form is included on the last page of this prospectus.

For fresh and innovative ideas on Polyolefins Market Research

Reach us at Tel: (281) 333-3313, Fax: (281) 333-3361

[email: bsingh@cmrhoutex.com](mailto:bsingh@cmrhoutex.com)



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361

RELATED PUBLICATIONS

REPORT NUMBER 178, 221, 222, and 223

ORDER FORM

Mail order form/payment to:
Chemical Market Resources, Inc.
1120 NASA Road 1, Suite 340
Houston, TX 77058-3320

Telephone Inquiries: 281-333-3313
Fax Inquiries: 281-333-3361
Wiring Instructions
Horizon Capital Bank: ADA No: 113023945
Acct: 78581

Polypropylene Films
\$ 5,500

High EVA Copolymers
\$ 5,000

Polyolefin Foams
\$ 6,500

Subscribers will be invoiced for the full amount upon order placement. Additional copies for the studies are available at \$200 each. Substantial discounts are available if the report is ordered as a part of the MT&T series. Contact CMR to obtain a prospectus on the complete MT&T series or visit our website at CMRHouTex.com.

New Generation Polyolefins (NGP)
\$18,000/yr.

Additional sets for NGP are available at \$600 per set of six issues. Contact CMR or visit our website for information on our back issues.

Subscribers agree to treat the contents of this report as confidential, not to be revealed to any person outside the subscriber organization, and to certify the report will be used solely by the officers and employees of the subscriber or majority owned subsidiaries (>51%).

.....
Authorized Signature

Date

.....
Company Name

Name/Designation

.....
Street Address

.....
City

State

Zip

.....
Telephone/Fax Numbers

If you are ordering extra copies, please include the addresses where the copies are to be mailed (on an additional piece of paper), if different from your own.



Chemical Market Resources, Inc.
Tel: (281) 333-3313 Fax: (281) 333 - 3361